FISH & RICHARDSON P.C.

DOCKET NUMBER:29712-0002003

# Applicant Initiated Interview Request Form

Application No. : 13/272,977 First Named Applicant: Susan Walvius et al.

Examiner: Nicholas F. Polito Art unit: 3673 Status of Application: Published

**Tentative Participants:**

(1) Examiner Polito (2) Frank L. Gerratana

(3) _____ (4) _____

**Proposed Date of Interview:** September 11, 2014 **Proposed Time:** 02:00 EST ( PM )

**Type of Interview Requested:**

(1) ☒ Telephonic (2) ☐ Personal (3) ☐ Video Conference

**Exhibit To Be Shown or Demonstrated:** ☐ YES ☒ NO

**if yes, provide brief description:** _____

## Issues To Be Discussed

| Issues Rej., Obj., etc) | Claims/ Fig. #s | Cited Art | Discussed | Agreed | Not Agreed |
|---|---|---|---|---|---|
| (1) 102 Rej. | Cl. 1 | Brooks | ☐ | ☐ | ☐ |
| (2) 112 Rej. | Cl. 41 | | ☐ | ☐ | ☐ |
| (3) | | | ☐ | ☐ | ☐ |
| (4) | | | ☐ | ☐ | ☐ |

☒ Continuation Sheet Attached

☐ Proposed Amendment or Arguments Attached

**Brief Description of Arguments to be Presented:**

See attached page for a description of the arguments to be presented.

**An interview was conducted on the above-identified application on _____ .**

**NOTE: This form should be completed by applicant and submitted to the examiner in advance of the interview (see MPEP § 713.01).**

**This application will not be delayed from issue because of applicant 's failure to submit a written record of this interview. Therefore, applicant is advised to file a statement of the substance of this interview (37 CPR 1.133(b)) as soon as possible.**

/Frank L. Gerratana/
(Applicant/Applicant's Representative Signature)

(Examiner/SPE Signature)

Frank L. Gerratana
Typed/Printed Name of Applicant or Representative

62,653
Registration Number, if applicable

Attorney Docket Number: 29712-0002003
23286590.doc

1) Regarding the 102 and 103 rejections, I would like to discuss the section of the office action reproduced below:

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Response to Arguments
64. Applicant's arguments filed 1/17/2014 have been fully considered but they are
not persuasive. Applicant argues that the prior art does not teach "elasticity such that
the fabric has a tendency to sag by an amount that is greater than a threshold amount
of sag determined by a finishing process, such that the sag would interfere with the
finishing process if the fabric were circularly knit at greater than a 72.5 inch
circumference". Applicant's specification describes the above limitation as an inherent
feature of spandex in paragraph 55. Brooks et al. teaches using spandex as a material
for a bed sheet. Therefore, according to the principles of MPEP 2112.01, since Brooks
et al. teaches spandex and the sag tendency is an inherent property of spandex, Brooks
et al. teaches the sag tendency.
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In particular, this portion of the office action appears to refer to the lines in claim 1 that say "the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference."

The reasoning set forth in the office action appears to take as fact that any amount of spandex (or other performance fiber) in the fabric would cause sag that would interfere with finishing. However, the claim is directed to performance fabric that has specific characteristics, including "at least one of higher breathability, higher heat transfer, and higher moisture wicking characteristics than a cotton fabric." Turning to the Brooks reference, the disclosed mattress cover is described as having sufficient spandex to introduce stretch, but there does not appear to be any indication in the Brooks reference that the mattress cover is manufactured with sufficient spandex (or other performance fiber) to both (1) introduce the claimed sag characteristics, and (2) have higher breathability, higher heat transfer, and higher moisture wicking characteristics than cotton.

2) Regarding the 112 rejection, I would like to discuss the draft proposed amendment to claim 41 shown below.

41. (Currently Amended) A bed sheet <u>having a width of greater than 72.5 inches</u> comprising

a circularly knit fabric comprising a man-made fiber,

the fabric having a gauge of at least 17 gauges,

~~the fabric having a width of greater than 72.5 inches,~~

the fabric having an elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference, and

the fabric having at least one of higher breathability, higher heat transfer, and higher moisture wicking characteristics than a cotton fabric.

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 13/272,977 | 10/13/2011 | Susan Walvius | 29712-0002003 | 4915 |

26161 7590 04/04/2014

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MINNEAPOLIS, MN 55440-1022

| EXAMINER | |
|---|---|
| POLITO, NICHOLAS F | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3673 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 04/04/2014 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

| Office Action Summary | Application No. 13/272,977 | Applicant(s) WALVIUS ET AL. | |
|---|---|---|---|
| | Examiner Nicholas Polito | Art Unit 3673 | AIA (First Inventor to File) Status No |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *1/17/2014*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims***

5)☒ Claim(s) *14-75* is/are pending in the application.

5a) Of the above claim(s) *38-40* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *14,16,19-24,27,33,35-37,41-54,56-68,70-72,74 and 75* is/are rejected.

8)☒ Claim(s) *15,17,18,25,26,28-32,34,55,69 and 73* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

**Application Papers**

10)☒ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

**Certified copies:**

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

## DETAILED ACTION

### *Specification*

1. The amendment filed 1/17/2014 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: claim 41 "the fabric having a width of greater than 72.5 inches".

Applicant is required to cancel the new matter in the reply to this Office Action.

### *Claim Objections*

2. Claim 62 is objected to because of the following informalities: please change "the the" in line 1 to - - the - -. Appropriate correction is required.

3. Claim 66 is objected to because of the following informalities: please change "been been" in line 5 to - - been - -. Appropriate correction is required.

4. Claim 67 is objected to because of the following informalities: please add - - is - - before "at least" in line 1. Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

5. The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 41-48 and 51 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The

claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention. The newly presented limitation of claim 41 “the fabric having a width of greater than 72.5 inches” does not have support in the specification as originally filed. Claims 42-48 depend on claim 41. The language of claim 41 is contradictory in that it later indicates that the fabric cannot be circularly knit at greater than a 72.5 inch circumference. Claim 51 presents a similar situation to claim 41.

7. The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 41-48 and 51 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention. The newly presented limitation of claim 41 “the fabric having a width of greater than 72.5 inches” is contradictory to a later limitation indicating that the fabric cannot be circularly knit at greater than a 72.5 inch circumference. Claims 42-48 depend on claim 41. Claim 51 presents a similar situation to claim 41.

9. Examiner suggests amending claim 41 to - - the bed sheet having a width of greater than 72.5 inches - - following applicant's specification that multiple fabric pieces are necessary to achieve a bed sheet having a width greater than 72.5 inches.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 14, 16, 19, 21-24, 49, 50, 52, 61-68, 70-72 and 75 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Brooks et al. (U.S. Patent No. 6,883,193).

12. Regarding claim 14, Brooks et al. teaches in Figure 1 a bed sheet comprising a knit fabric comprising a man-made fiber, the fabric having a width of greater than 60 inches (king size), the fabric having an elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference, and the fabric having at least one of higher breathability, higher heat transfer, and higher moisture wicking characteristics than a cotton fabric (col. 2, line 32 – col. 9, line 11 & MPEP 2112.01 [inherent properties of spandex]).

13. Regarding claim 16, Brooks et al. teaches in Figure 1 the bed sheet of claim 14, comprising piping (16, 18).

14. Regarding claim 19, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 14 in which the fabric is knit of the man-made fiber.

15. Regarding claim 21, the bed sheet of claim 14 in which the fabric is circularly knit.

16. Regarding claim 22, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 14 that is sufficiently stretchable to fit a baby crib and an adult bed.

17. Regarding claim 23, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 14 that is sufficiently stretchable to fit a standard rectangular bed and a smaller, non-rectangular marine bed.

18. Regarding claim 24, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 14 that is sufficiently stretchable to fit a crib and a standard adult bed.

19. Regarding claim 49, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 14 in which the fabric comprises polyurethanepolyurea copolymer fiber.

20. Regarding claim 50, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 49 in which the polyurethanepolyurea copolymer fiber is included in the fabric in a proportion such that, if circularly knit at a high gauge, the fabric could be knit at no more than a 72.5 inch circumference without losing integrity of the polyurethanepolyurea copolymer fiber (see also MPEP 2112.01).

21. Regarding claim 52, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 14 in which the bed sheet is at least 72.5 inches wide (when stretched to fit a king).

22. Regarding claim 61, Brook et al. teaches in Figure 1 a bed sheet comprising a first fabric area (12) where the majority of an individual body rests when the bed sheet is

placed on a bed, the first fabric area comprising a fabric that a) includes polyurethanepolyurea copolymer fiber and b) has been circularly knit at 17 gauges or higher, the polyurethanepolyurea copolymer fiber included in the fabric in a proportion such that, if circularly knit at a high gauge, the fabric could be knit at no more than a 72.5 inch circumference without losing integrity of the polyurethanepolyurea copolymer fiber (col. 2, line 32 – col. 9, line 11 & MPEP 2112.01 [inherent properties of spandex]).

23. Regarding claim 62, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 61 in which the polyurethanepolyurea copolymer fiber included in the fabric in a proportion such that the fabric has at least one of higher breathability, higher heat transfer, and higher moisture wicking characteristics than a cotton fabric (see also MPEP 2112.01).

24. Regarding claim 63, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 61 in which the first fabric area has a width of a twin size bed.

25. Regarding claim 64, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 61 in which the first fabric area has a width of a full size bed.

26. Regarding claim 65, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 61 in which the first fabric area has a width of a queen size bed.

27. Regarding claim 66, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 61 in which the first fabric area has a width of a king size bed.

28. Regarding claim 67, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 61 in which the first fabric area at least 72.5 inches wide (when stretched to fit a king).

29. Regarding claim 68, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 61 that is at least 72.5 inches wide (when stretched to fit a king).

30. Regarding claim 70, Brooks et al. teaches in Figure 1 the bed sheet of claim 61 in which the bed sheet comprises at least two portions (12, 14) of the circularly knit fabric joined to form a finished fabric.

31. Regarding claim 71, Brooks et al. teaches in Figure 1 the bed sheet of claim 61, comprising piping (16, 18).

32. Regarding claim 72, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 61 being stretchable to fit at least two of a standard rectangular adult bed, a baby crib, and a marine bed.

33. Regarding claim 75, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 61 in which the fabric has an elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference (see also MPEP 2112.01).

***Claim Rejections - 35 USC § 103***

39. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

40. Claims 20, 33, 35-37, 53, 54 and 56-60 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Brooks et al. in view of Taniguchi et al. (U.S. Pub. No. 2005/0132754). Claim 56 in view of Official Notice as well.

41. Regarding claim 20, Brooks et al. teaches the bed sheet of claim 14. Brooks et al. does not teach wherein the fabric has a gauge of at least 17 gauges. Taniguchi et al. teaches in paragraphs 21, 22 and 35 a bed sheet having been circularly knit at a gauge of at least 17 gauges. In view of Taniguchi et al., it would have been obvious to a person having ordinary skill in the art at the time the invention was made to circularly knit the fabric of Brooks et al. at 17 gauges or higher, as in Taniguchi et al., to increase softness, elasticity and flexibility.

42. Regarding claim 33, Brooks et al. teaches in Figure 1 a bed sheet comprising a first fabric area (12) where a majority of an individual rests when the bed sheet is on a bed, the first fabric area comprising a fabric including a high performance man-made fiber, the fabric having an elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference (col. 2, line 32 – col. 9 line 11 &

MPEP 2112.01 [inherent properties of spandex]).

Brooks et al. does not teach wherein the fabric is circularly knit at 17 gauges or higher. Taniguchi et al. teaches in paragraphs 21, 22 and 35 a bed sheet having been circularly knit at 17 gauges or higher. In view of Taniguchi et al., it would have been obvious to a person having ordinary skill in the art at the time the invention was made to circularly knit the fabric of Brooks et al. at 17 gauges or higher, as in Taniguchi et al., to increase softness, elasticity and flexibility.

43. Regarding claim 35, Brooks et al. teaches in Figure 1 the bed sheet of claim 33 in which the bed sheet comprises at least two portions (12, 14) of the circularly knit fabric joined to form a finished fabric.

44. Regarding claim 36, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 33 in which the fabric comprises polyurethanepolyurea copolymer fiber.

45. Regarding claim 37, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 36 in which the polyurethanepolyurea copolymer fiber is included in the fabric in a proportion such that, if circularly knit at a high gauge, the fabric could be knit at no more than a 72.5 inch circumference without losing integrity of the polyurethanepolyurea copolymer fiber (see also MPEP 2112.01).

46. Regarding claim 53, Brooks et al. teaches in Figure 1 the bed sheet of claim 33, comprising piping (16, 18).

47. Regarding claim 54, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 33 being stretchable to fit at least two of a standard rectangular adult bed, a baby crib, and a marine bed.

48. Regarding claim 56, Brooks et al. teaches the bed sheet of claim 33. Brooks et al. does not teach an element that can be cinched to increase tension around an edge of the bed sheet. The examiner takes Official Notice that it is commonly known in the art to provide an element to the edge of a bed sheet in order to cinch and increase the tension around the edge. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to add to the bed sheet of Brooks et al. a cinching element to provide a tighter fit.

49. Regarding claim 57, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 33 in which the first fabric area has a width of a twin size bed.

50. Regarding claim 58, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 33 in which the first fabric area has a width of a full size bed.

51. Regarding claim 59, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 33 in which the first fabric area has a width of a queen size bed.

52. Regarding claim 60, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 33 in which the first fabric area has a width of a king size bed.

53. Claims 27 and 74 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Brooks et al. in view of Official Notice.

54. Regarding claim 27, Brooks et al. teaches the bed sheet of claim 14. Brooks et al. does not teach an element that can be cinched to increase tension around an edge of the bed sheet. The examiner takes Official Notice that it is commonly known in the art to provide an element to the edge of a bed sheet in order to cinch and increase the tension around the edge. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to add to the bed sheet of Brooks et al. a cinching element to provide a tighter fit.

55. Regarding claim 74, Brooks et al. teaches the bed sheet of claim 61. Brooks et al. does not teach an element that can be cinched to increase tension around an edge of the bed sheet. The examiner takes Official Notice that it is commonly known in the art to provide an element to the edge of a bed sheet in order to cinch and increase the tension around the edge. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to add to the bed sheet of Brooks et al. a cinching element to provide a tighter fit.

***Allowable Subject Matter***

56. Claims 15, 17, 18, 25, 26, 28-32, 34, 55, 69 and 73 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

57. Regarding claim 15, the prior art does not teach “the bed sheet of claim 14 wherein the fabric comprises a finished fabric of at least 90 inches wide comprising: a first fabric portion; and a second fabric portion; at least one of the first and second fabric

portions being circularly knit; at least one of the fabric portions comprising a performance fabric portion; the first and second fabric portions being discrete and joined to form the finished fabric". Claims 17, 18, and 28-32 depend on claim 15.

58. Regarding claim 25, the prior art does not teach "the bed sheet of claim 14 that is at least 90 inches wide".

59. Regarding claim 26, the prior art does not teach "the bed sheet of claim 14 having dimensions of approximately 102 inches in length and approximately 91 inches in width".

60. Regarding claim 34, the prior art does not teach "the bed sheet of claim 33 that is at least 90 inches wide".

61. Regarding claim 55, the prior art does not teach "the bed sheet of claim 33 having dimensions of approximately 102 inches in length and approximately 91 inches in width".

62. Regarding claim 69, the prior art does not teach "the bed sheet of claim 61 that is at least 90 inches wide".

63. Regarding claim 73, the prior art does not teach "the bed sheet of claim 61 having dimensions of approximately 102 inches in length and approximately 91 inches in width".

***Response to Arguments***

64. Applicant's arguments filed 1/17/2014 have been fully considered but they are not persuasive. Applicant argues that the prior art does not teach "elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount

of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference". Applicant's specification describes the above limitation as an inherent feature of spandex in paragraph 55. Brooks et al. teaches using spandex as a material for a bed sheet. Therefore, according to the principles of MPEP 2112.01, since Brooks et al. teaches spandex and the sag tendency is an inherent property of spandex, Brooks et al. teaches the sag tendency.

***Conclusion***

65. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas Polito whose telephone number is (571)270-5923. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Cuomo can be reached on (571) 272-6856. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nicholas Polito/

Primary Examiner, Art Unit 3673

3/28/2014

| Substitute Disclosure Form / U.S. Department of Commerce Patent and Trademark Office | Attorney Docket No. | Application No. |
|---|---|---|
| **Information Disclosure Statement by Applicant** (Use several sheets if necessary) (37 CFR §1.98(b)) | 29712-0002003 | 13/272,977 |
| | Applicant: Susan Walvius et al. | |
| | Filing Date: October 13, 2011 | Group Art Unit: 3673 |

| U.S. Patent Documents | | | | | | | |
|---|---|---|---|---|---|---|---|
| Examiner Initial | Desig. ID | Document Number | Publication Date | Patentee | Class | Subclass | Filing Date If Appropriate |

| Foreign Patent Documents or Published Foreign Patent Applications | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Examiner Initial | Desig. ID | Document Number | Publication Date | Country or Patent Office | Class | Subclass | Translation Yes | Translation No |

| Other Documents (include Author, Title, Date, and Place of Publication) | | |
|---|---|---|
| Examiner Initial | Desig. ID | Document |
| | 1 | Chinese Office Action with English translation from corresponding Chinese Application No. 200980147643.6 issued May 17, 2013 (35 pages). |
| | 2 | Long, Hairu, "Knitting Technology", English translation included, China Textile & Apparel Press, 1st Edition, pages 12-13, June 2008 (9 pages). |
| | 3 | Response to Office Action dated May 27, 2013 in Canadian Application No. 2738658, filed with the Office on June 17, 2013 (20 pages). |

| Examiner Signature | Date Considered |
|---|---|
| /Nicholas Polito/ | 03/28/2014 |

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.P./

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 13272977 | WALVIUS ET AL. |
| | Examiner | Art Unit |
| | NICHOLAS POLITO | 3673 |

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|---|---|---|---|---|---|---|---|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☒ CPA ☒ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 11/09/2011 | 12/21/2011 | 05/22/2012 | 07/09/2013 | 03/28/2014 | | | | |
| 999 | 1 | - | - | - | - | - | | | | |
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| | 8 | - | - | - | - | - | | | | |
| | 9 | - | - | - | - | - | | | | |
| | 10 | - | - | - | - | - | | | | |
| | 11 | - | - | - | - | - | | | | |
| | 12 | - | - | - | - | - | | | | |
| | 13 | - | - | - | - | - | | | | |
| | 14 | ÷ | ✓ | ✓ | ✓ | ✓ | | | | |
| | 15 | ÷ | ✓ | ✓ | ✓ | O | | | | |
| | 16 | ÷ | ✓ | ✓ | ✓ | ✓ | | | | |
| | 17 | ÷ | ✓ | ✓ | ✓ | O | | | | |
| | 18 | ÷ | ✓ | ✓ | ✓ | O | | | | |
| | 19 | ÷ | ✓ | ✓ | ✓ | ✓ | | | | |
| | 20 | ÷ | ✓ | ✓ | ✓ | ✓ | | | | |
| | 21 | ÷ | ✓ | ✓ | ✓ | ✓ | | | | |
| | 22 | ÷ | ✓ | ✓ | ✓ | ✓ | | | | |
| | 23 | ÷ | ✓ | ✓ | ✓ | ✓ | | | | |
| | 24 | ÷ | ✓ | ✓ | ✓ | ✓ | | | | |
| | 25 | ÷ | ✓ | ✓ | ✓ | O | | | | |
| | 26 | ÷ | ✓ | ✓ | ✓ | O | | | | |
| | 27 | ÷ | ✓ | ✓ | ✓ | ✓ | | | | |
| | 28 | ÷ | ✓ | ✓ | ✓ | O | | | | |
| | 29 | ÷ | ✓ | ✓ | ✓ | O | | | | |
| | 30 | ÷ | ✓ | ✓ | ✓ | O | | | | |
| | 31 | ÷ | ✓ | ✓ | ✓ | O | | | | |
| | 32 | ÷ | ✓ | ✓ | ✓ | O | | | | |
| | 33 | ÷ | ✓ | ✓ | ✓ | ✓ | | | | |
| | 34 | ÷ | ✓ | ✓ | ✓ | O | | | | |
| | 35 | ÷ | ✓ | ✓ | ✓ | ✓ | | | | |
| | 36 | ÷ | ✓ | ✓ | ✓ | ✓ | | | | |

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 13272977 | WALVIUS ET AL. |
| | **Examiner** | **Art Unit** |
| | NICHOLAS POLITO | 3673 |

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|---|---|---|---|---|---|---|---|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☒ CPA ☒ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 11/09/2011 | 12/21/2011 | 05/22/2012 | 07/09/2013 | 03/28/2014 | | | | |
| | 37 | ÷ | O | O | ✓ | ✓ | | | | |
| | 38 | ÷ | N | N | N | N | | | | |
| | 39 | ÷ | N | N | N | N | | | | |
| | 40 | ÷ | N | N | N | N | | | | |
| | 41 | ÷ | ✓ | ✓ | ✓ | ✓ | | | | |
| | 42 | | | | | ✓ | | | | |
| | 43 | | | | | ✓ | | | | |
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| | 45 | | | | | ✓ | | | | |
| | 46 | | | | | ✓ | | | | |
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| | 55 | | | | | O | | | | |
| | 56 | | | | | ✓ | | | | |
| | 57 | | | | | ✓ | | | | |
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| | 62 | | | | | ✓ | | | | |
| | 63 | | | | | ✓ | | | | |
| | 64 | | | | | ✓ | | | | |
| | 65 | | | | | ✓ | | | | |
| | 66 | | | | | ✓ | | | | |
| | 67 | | | | | ✓ | | | | |
| | 68 | | | | | ✓ | | | | |
| | 69 | | | | | O | | | | |
| | 70 | | | | | ✓ | | | | |
| | 71 | | | | | ✓ | | | | |
| | 72 | | | | | ✓ | | | | |

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| | 13272977 | WALVIUS ET AL. |
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| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

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| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 11/09/2011 | 12/21/2011 | 05/22/2012 | 07/09/2013 | 03/28/2014 | | | | |
| | 73 | | | | | O | | | | |
| | 74 | | | | | ✓ | | | | |
| | 75 | | | | | ✓ | | | | |

**EAST Search History**

**EAST Search History (Prior Art)**

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| S1 | 1 | 12/569659 or 13/271884 or 13/272977 | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/19 16:46 |
| S2 | 23 | "5"/.clas. and ((circle or circular) adj knit) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/19 16:49 |
| S3 | 118 | ((circle or circular) adj knit) and stitch and (heat adj set) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/19 16:52 |
| S4 | 18 | ((circle or circular) adj knit) same stitch same (heat adj set) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/19 16:52 |
| S5 | 3 | "5"/.clas. and (((circle or circular) adj knit) and stitch and (heat adj set)) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/19 16:57 |
| S6 | 27828 | bedding or (bed near sheet) or (mattress near cover$3) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 14:21 |
| S7 | 1867 | ((circle or circular) adj knit) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 14:21 |
| S8 | 109 | S6 and S7 | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 14:21 |
| S9 | 24359 | (heat-set$4) or (heat adj set$4) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 14:23 |
| S10 | 11 | S6 and S7 and S9 | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 14:24 |
| S11 | 23 | flatlock near stitch$3 | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 14:27 |
| S12 | 0 | (12/162516).APP. | USPAT; USOCR | OR | OFF | 2011/12/20 15:29 |
| S13 | 0 | ("2009/0044338").URPN. | USPAT | OR | OFF | 2011/12/20 15:29 |

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|---|---|---|---|---|---|---|
| S14 | 0 | (10/710179).APP. | USPAT; USOCR | OR | OFF | 2011/12/20 15:32 |
| S15 | 1 | ("2005/0284189").URPN. | USPAT | OR | OFF | 2011/12/20 15:33 |
| S16 | 20 | ("4504991" \| "4801493" \| "5279878" \| "5645926" \| "5935882" \| "5972512").PN. OR ("6823548").URPN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/20 15:44 |
| S17 | 10 | 5/482-502.ccls. and ((circle or circular) adj knit) | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/20 15:45 |
| S18 | 12 | 5/482-502.ccls. and ((circle or circular or round) near knit$3) | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/20 15:46 |
| S19 | 8356 | ((circle or circular or round) adj knit$4) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 15:59 |
| S20 | 8586 | ((circle or circular or round) near knit$4) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 15:59 |
| S21 | 165 | S6 and S20 | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 15:59 |
| S22 | 9978 | ((circle or circular or round or jersey or fleece or terry or double) adj knit$4) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 16:12 |
| S23 | 28 | 5/482-502.ccls. and ((circle or circular or round or jersey or fleece or terry or double) adj knit$4) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 16:12 |
| S24 | 281 | 5/482-502.ccls. and knit$4 | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 16:22 |
| S25 | 3 | (("5765241") or ("5817391") or ("6381779")).PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/20 18:07 |
| S26 | 2028 | 5/482-484,486,499-502.ccls. | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/20 18:09 |
| S27 | 1 | ((susan near walvius) or (michelle near marciniak)).in. | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/20 18:27 |
| S28 | 55 | 5/482-502.ccls. and spandex | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/21 17:24 |
| S29 | 47 | spandex with antimicrobial | US-PGPUB; | OR | ON | 2011/12/21 17:34 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | USPAT; USOCR | | | |
| S30 | 0 | spandex with circumference with gauge | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/21 17:38 |
| S31 | 4 | spandex same circumference same gauge | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/21 17:38 |
| S32 | 0 | (11/759586).APP. | USPAT; USOCR | OR | OFF | 2011/12/21 20:35 |
| S33 | 41 | 5/482-502.ccls. and (antimicrobial or anti-microbial) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/21 20:40 |
| S34 | 37 | (US-20110000020-$ or US-20040060120-$ or US-20060046591-$ or US-20080189824-$ or US-20090044338-$ or US-20100088818-$ or US-20050284189-$ or US-20080004395-$ or US-20110208145-$ or US-20030068949-$ or US-20040045955-$ or US-20100304632-$ or US-20070050909-$ or US-20070283493-$ or US-20070174972-$).did. or (US-6192538-$ or US-3996771-$ or US-4794767-$ or US-6776014-$ or US-3906750-$ or US-6823548-$ or US-5950264-$ or US-6910235-$ or US-5450630-$ or US-5784721-$ or US-5867837-$ or US-7743476-$ or US-4504990-$ or US-5651847-$ or US-5948711-$ or US-6028241-$ or US-7268320-$ or US-7856684-$ or US-5503840-$ or US-6015816-$ or US-4690859-$).did. or (US-3187522-$).did. | US-PGPUB; USPAT; USOCR | OR | OFF | 2012/04/02 14:29 |
| S35 | 4 | S34 and gauge | US-PGPUB; USPAT; USOCR | OR | OFF | 2012/04/02 14:29 |
| S36 | 43 | 5/482-502.ccls. and gauge | US-PGPUB; USPAT; USOCR | OR | ON | 2012/05/21 16:12 |
| S37 | 1 | "13271884" | US-PGPUB; USPAT; USOCR | OR | ON | 2012/05/21 16:25 |
| S38 | 4054 | (circle or circular) near2 knit$3 | US-PGPUB; USPAT; USOCR | OR | ON | 2012/05/21 16:28 |
| S39 | 384230 | gauge | US-PGPUB; USPAT; USOCR | OR | ON | 2012/05/21 16:28 |
| S40 | 574970 | bed or mattress | US-PGPUB; USPAT; USOCR | OR | ON | 2012/05/21 16:29 |

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|---|---|---|---|---|---|---|
| S41 | 147 | S38 and S39 and S40 | US-PGPUB; USPAT; USOCR | OR | ON | 2012/05/21 16:29 |
| S42 | 11 | (("2804632") or ("20110000020") or ("20120030874") or ("4648186") or ("5092088") or ("5636380") or ("7117695") or ("20080028523") or ("20070266495") or ("20040172754")).PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2012/05/22 11:38 |
| S43 | 31 | 5/482-484,486,499-502.ccls. and @pd>"20120101" | US-PGPUB; USPAT; USOCR | OR | OFF | 2012/05/22 11:40 |
| S44 | 3 | (("5765241") or ("5817391") or ("6381779")).PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2012/05/22 11:42 |
| S45 | 390 | "5"/.clas. and (spandex or elastene or lycra or coolmax or thermax or thermastat) | US-PGPUB; USPAT; USOCR | OR | ON | 2013/07/08 16:27 |
| S46 | 18 | ("20040172754" \| "20050132754" \| "20070266495" \| "20070283493" \| "20080028523" \| "20110000020" \| "20120030874" \| "2804632" \| "4648186" \| "4690859" \| "5092088" \| "5636380" \| "5765241" \| "5817391" \| "6381779" \| "6823548" \| "7117695").PN. OR ("8402580").URPN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2013/07/08 17:11 |
| S47 | 68 | spandex with gauge | US-PGPUB; USPAT; USOCR | OR | ON | 2013/07/09 20:30 |
| S48 | 50 | "5"/.clas. and ((circle or circular$2) near5 knit$4) | US-PGPUB; USPAT; USOCR | OR | ON | 2013/07/09 20:40 |
| S49 | 31 | ((circle or circular$2) near5 knit$4) same2 (spandex or elastene or lycra or coolmax or thermax or thermastat) same2 (bedding or blanket or mattress) | US-PGPUB; USPAT; USOCR | OR | ON | 2013/07/09 20:48 |
| S50 | 78 | 5/482-484,486,499-502.ccls. and @pd>"20120501" | US-PGPUB; USPAT; USOCR | OR | OFF | 2013/07/09 21:22 |
| S51 | 3 | 13/272977 | US-PGPUB; USPAT; USOCR | OR | OFF | 2014/03/27 16:13 |
| S55 | 74 | 5/482-484,486,499-502.ccls. and (("9"? or "1"??) adj inches) | US-PGPUB; USPAT; USOCR | OR | OFF | 2014/03/27 16:50 |
| S56 | 45 | 5/482-484,486,499-502.ccls. and @pd>"20130701" | US-PGPUB; USPAT; USOCR | OR | OFF | 2014/03/28 16:59 |

**EAST Search History (Interference)**

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**3/28/2014 5:00:51 PM**
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| Substitute Disclosure Form / U.S. Department of Commerce Patent and Trademark Office | Attorney Docket No. | Application No. |
|---|---|---|
| **Information Disclosure Statement by Applicant** (Use several sheets if necessary) (37 CFR §1.98(b)) | 29712-0002003 | 13/272,977 |
| | Applicant: Susan Walvius et al. | |
| | Filing Date: October 13, 2011 | Group Art Unit: 3673 |

| U.S. Patent Documents | | | | | | | |
|---|---|---|---|---|---|---|---|
| Examiner Initial | Desig. ID | Document Number | Publication Date | Patentee | Class | Subclass | Filing Date If Appropriate |

| Foreign Patent Documents or Published Foreign Patent Applications | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Examiner Initial | Desig. ID | Document Number | Publication Date | Country or Patent Office | Class | Subclass | Translation Yes | Translation No |

| Other Documents (include Author, Title, Date, and Place of Publication) | | |
|---|---|---|
| Examiner Initial | Desig. ID | Document |
| | 1 | Chinese Office Action with English translation from corresponding Chinese Application No. 200980147643.6 issued May 17, 2013 (35 pages). |
| | 2 | Long, Hairu, "Knitting Technology", English translation included, China Textile & Apparel Press, 1st Edition, pages 12-13, June 2008 (9 pages). |
| | 3 | Response to Office Action dated May 27, 2013 in Canadian Application No. 2738658, filed with the Office on June 17, 2013 (20 pages). |
| | 4 | Response to Chinese Office Action with English translation from Chinese Application No. 200980147643.6 issued May 17, 2013, filed September 1, 2013 (7 pages). |
| | 5 | Chinese Office Action with English translation from Chinese Application 200980147643.6 issued December 6, 2013 (10 pages). |

| Examiner Signature | Date Considered |
|---|---|
| /Nicholas Polito/ | 03/28/2014 |

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.P./

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|---|---|---|
| | 13272977 | WALVIUS ET AL. |
| | Examiner | Art Unit |
| | NICHOLAS POLITO | 3673 |

| CPC- SEARCHED | | |
|---|---|---|
| Symbol | Date | Examiner |
| | | |

| CPC COMBINATION SETS - SEARCHED | | |
|---|---|---|
| Symbol | Date | Examiner |
| | | |

| US CLASSIFICATION SEARCHED | | | |
|---|---|---|---|
| Class | Subclass | Date | Examiner |
| 5 | 482 - 484, 486, 496, 497, 499 - 502 | 12/21/2011 | NP |
| | Above Search Updated | 5/22/2012 | NP |
| | Above Search Updated | 7/9/2013 | NP |
| | Above Search Updated | 3/28/2014 | NP |

| SEARCH NOTES | | |
|---|---|---|
| Search Notes | Date | Examiner |
| EAST Search History Attached | 12/21/2011 | NP |
| EAST Search History Attached | 5/22/2012 | NP |
| EAST Search History Attached | 7/9/2013 | NP |
| EAST Search History Attached | 3/28/2014 | NP |

| INTERFERENCE SEARCH | | | |
|---|---|---|---|
| US Class/ CPC Symbol | US Subclass / CPC Group | Date | Examiner |
| | | | |

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| | /NICHOLAS POLITO/<br>Primary Examiner.Art Unit 3673 |

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|---|---|---|---|
| Applicant | : Susan Walvius et al. | Art Unit | : 3673 |
| Serial No. | : 13/272,977 | Examiner | : Nicholas F. Polito |
| Filed | : October 13, 2011 | Conf. No. | : 4915 |
| Title | : FABRIC SYSTEM | | |

**Mail Stop Amendment**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY TO ACTION OF JULY 17, 2013

Amendments to the claims (this listing replaces all prior versions):

1-13. (Cancelled)

14. (Currently Amended) A bed sheet comprising

a knit fabric ~~of~~ comprising a man-made fiber,

~~the fabric having been knit at 17 gauges or higher,~~

the fabric having a width of greater than 60 inches,

the fabric having an elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference, and

the fabric having at least one of higher breathability, higher heat transfer, and higher moisture wicking characteristics than a cotton fabric.

15. (Currently Amended) The bed sheet of claim 14 wherein the fabric comprises a finished fabric at least 90 inches wide comprising:

a first ~~circular knitted~~ fabric portion; and

a second ~~circular knitted~~ fabric portion;

at least one of the first and second fabric portions being circularly knit;

at least one of the fabric portions comprising a performance fabric portion;

the first and second fabric portions being discrete and joined to form the finished fabric.

16. (Previously Presented) The bed sheet of claim 14, comprising piping.

17. (Previously Presented) The bed sheet of claim 15, wherein the first and second fabric portions have different fabric characteristics.

18. (Previously Presented) The bed sheet of claim 17, wherein at least one of the fabric characteristics comprises moisture management.

19. (Previously Presented) The bed sheet of claim 14 in which the fabric is knit of the man-made fiber.

20. (Previously Presented) The bed sheet of claim 14 in which the fabric has a gauge of at least 17 gauges.

21. (Previously Presented) The bed sheet of claim 14 in which the fabric is circularly knit.

22. (Currently Amended) The bed sheet of claim 14 ~~being~~ that is sufficiently stretchable to fit ~~either~~ a baby crib and an adult bed.

23. (Previously Presented) The bed sheet of claim 14 that is sufficiently stretchable to fit a standard rectangular bed and a smaller, non-rectangular marine bed.

24. (Currently Amended) The bed sheet of claim 14 that is sufficiently stretchable to fit ~~either~~ a crib ~~or~~ and a standard adult bed.

25. (Previously Presented) The bed sheet of claim 14 that is at least 90 inches wide.

26. (Previously Presented) The bed sheet of claim 14 having dimensions of approximately 102 inches in length and approximately 91 inches in width.

27. (Currently Amended) The bed sheet of claim 14 comprising ~~a pull tie~~ an element that can be cinched to increase tension around an edge of the bed sheet.

28. (Currently Amended) The bed sheet of claim 17, wherein at least one of the fabric characteristics ~~is~~ comprises UV protection.

29. (Currently Amended) The bed sheet of claim 17, wherein at least one of the fabric characteristics ~~is~~ comprises an anti-microbial characteristic ~~fabric~~.

30. (Currently Amended) The bed sheet of claim 17, wherein at least one of the fabric characteristics ~~is~~ comprises thermo-regulation.

31. (Currently Amended) The bed sheet of claim 17, wherein at least one of the fabric characteristics ~~is~~ comprises wind resistance.

32. (Currently Amended) The bed sheet of claim 17, wherein at least one of the fabric characteristics ~~is~~ comprises water resistance.

33. (Currently Amended) A bed sheet comprising

a first fabric area where a majority of an individual body rests when the bed sheet is on a bed,

the first fabric area comprising a fabric circularly knit at 17 gauges or higher and including a high performance man-made fiber,

the fabric having an elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference.

34. (Previously Presented) The bed sheet of claim 33 that is at least 90 inches wide.

35. (Currently Amended) The bed sheet of claim 33 in which the bed sheet comprises at least two portions of the circularly knit fabric joined to form a finished fabric.

36. (Previously Presented) The bed sheet of claim 33 in which the fabric comprises polyurethanepolyurea copolymer fiber.

37. (Previously Presented) The bed sheet of claim 36 in which the polyurethanepolyurea copolymer fiber is included in the fabric in a proportion such that, if circularly knit at a high gauge, the fabric could be knit at no more than a 72.5 inch circumference without losing integrity of the polyurethanepolyurea copolymer fiber.

38. (Withdrawn) A bed covered by a bed sheet comprising a fabric of a man-made fiber, the fabric having higher breathability, higher heat transfer, and higher moisture wicking characteristics than a cotton fabric.

39. (Withdrawn) The bed of claim 38 in which the fabric comprises comprising a circularly knit fabric.

40. (Withdrawn) The bed of claim 38 wherein the bed sheet is at least 90 inches wide.

41. (Currently Amended) A bed sheet comprising

a circularly knit fabric ~~circularly knit of~~ comprising a man-made fiber,

the fabric having a gauge of at least 17 gauges,

the fabric having a width of greater than 72.5 inches,

the fabric having an elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference, and

the fabric having at least one of higher breathability, higher heat transfer, and higher moisture wicking characteristics than a cotton fabric.

42. (New) The bed sheet of claim 41, comprising piping.

43. (New) The bed sheet of claim 41 being stretchable to fit at least two of a standard rectangular adult bed, a baby crib, and a marine bed.

44. (New) The bed sheet of claim 41 that is at least 90 inches wide.

45. (New) The bed sheet of claim 41 having dimensions of approximately 102 inches in length and approximately 91 inches in width.

46. (New) The bed sheet of claim 41 comprising an element that can be cinched to increase tension around an edge of the bed sheet.

47. (New) The bed sheet of claim 41 in which the fabric comprises polyurethanepolyurea copolymer fiber.

48. (New) The bed sheet of claim 47 in which the polyurethanepolyurea copolymer fiber is included in the fabric in a proportion such that, if circularly knit at a high gauge, the fabric could be knit at no more than a 72.5 inch circumference without losing integrity of the polyurethanepolyurea copolymer fiber.

49. (New) The bed sheet of claim 14 in which the fabric comprises polyurethanepolyurea copolymer fiber.

50. (New) The bed sheet of claim 49 in which the polyurethanepolyurea copolymer fiber is included in the fabric in a proportion such that, if circularly knit at a high gauge, the fabric could be knit at no more than a 72.5 inch circumference without losing integrity of the polyurethanepolyurea copolymer fiber.

51. (New) The bed sheet of claim 14 in which the fabric has a width of greater than 72.5 inches.

52. (New) The bed sheet of claim 14 in which the bed sheet is at least 72.5 inches wide.

53. (New) The bed sheet of claim 33, comprising piping.

54. (New) The bed sheet of claim 33 being stretchable to fit at least two of a standard rectangular adult bed, a baby crib, and a marine bed.

55. (New) The bed sheet of claim 33 having dimensions of approximately 102 inches in length and approximately 91 inches in width.

56. (New) The bed sheet of claim 33 comprising an element that can be cinched to increase tension around an edge of the bed sheet.

57. (New) The bed sheet of claim 33 in which the first fabric area has a width of a twin size bed.

58. (New) The bed sheet of claim 33 in which the first fabric area has a width of a full size bed.

59. (New) The bed sheet of claim 33 in which the first fabric area has a width of a queen size bed.

60. (New) The bed sheet of claim 33 in which the first fabric area has a width of a king size bed.

61. (New) A bed sheet comprising

a first fabric area where the majority of an individual body rests when the bed sheet is placed on a bed,

the first fabric area comprising a fabric that a) includes polyurethanepolyurea copolymer fiber and b) has been been circularly knit at 17 gauges or higher,

the polyurethanepolyurea copolymer fiber included in the fabric in a proportion such that, if circularly knit at a high gauge, the fabric could be knit at no more than a 72.5 inch circumference without losing integrity of the polyurethanepolyurea copolymer fiber.

62. (New) The bed sheet of claim 61 in which the the polyurethanepolyurea copolymer fiber included in the fabric in a proportion such that the fabric has at least one of higher breathability, higher heat transfer, and higher moisture wicking characteristics than a cotton fabric.

63. (New) The bed sheet of claim 61 in which the first fabric area has a width of a twin size bed.

64. (New) The bed sheet of claim 61 in which the first fabric area has a width of a full size bed.

65. (New) The bed sheet of claim 61 in which the first fabric area has a width of a queen size bed.

66. (New) The bed sheet of claim 61 in which the first fabric area has a width of a king size bed.

67. (New) The bed sheet of claim 61 in which the first fabric area at least 72.5 inches wide.

68. (New) The bed sheet of claim 61 that is at least 72.5 inches wide.

69. (New) The bed sheet of claim 61 that is at least 90 inches wide.

70. (New) The bed sheet of claim 61 in which the bed sheet comprises at least two portions of the circularly knit fabric joined to form a finished fabric.

71. (New) The bed sheet of claim 61, comprising piping.

72. (New) The bed sheet of claim 61 being stretchable to fit at least two of a standard rectangular adult bed, a baby crib, and a marine bed.

73. (New) The bed sheet of claim 61 having dimensions of approximately 102 inches in length and approximately 91 inches in width.

74. (New) The bed sheet of claim 61 comprising an element that can be cinched to increase tension around an edge of the bed sheet.

75. (New) The bed sheet of claim 61 in which the fabric has an elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference.

## INTERVIEW SUMMARY

The applicant's representative Frank Gerratana (Reg. No. 62,653) thanks the examiner for attending a telephone interview on October 21, 2013. The interview included a discussion of claim 14 in view of the cited references. The applicant's representative requested favorable action in view of a proposed amendment to claim 1, submitted in advance to the examiner. The examiner indicated that the claim would likely be allowable if a) the claim recited a width of the bed sheet, or alternatively b) the claim indicated the area of the bed sheet in which performance fabric is included. The discussion is reflected in the foregoing claim amendments and following remarks.

## REMARKS

The comments of the applicant below are each preceded by related comments of the examiner (in small, bold type).

Claims 14-24, 27-33, 35-37 and 41 were rejected under pre-AIA 35 U.S.C. 103(a) as allegedly being unpatentable over Brooks et al. (U.S. Patent No. 6,883,193) in view of Taniguchi et al. (U.S. Pub. No. 2005/0132754). Independent claims 14, 33, and 41 have been amended. The rejections are believed to be moot in view of the amendments to the independent claims.

Further, in rejecting independent claims 14, 33, and 41, the examiner cited MPEP 2112.01, which states "[w]here the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes a *prima facie* case of either anticipation or obviousness has been established." A rejection of this kind requires the Office to show "a sound basis for believing that the products of the applicant and the prior art are the same." *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). The applicant respectfully points out that the office action does not appear to set forth a sound basis for believing that the products of the claims and the prior art are the same. For example, the cited references do not appear to have described a product having an "elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference," as recited in claims 14, 33, and 41. If the rejection is maintained, the applicant respectfully requests a showing of the sound basis for the rejection citing MPEP 2112.01.

The examiner also cited MPEP 2112.01 in the rejections of claims 23, 24, 28, 29, 30, 31, 32. If the rejection of those claims is maintained, the application respectfully requests a similar showing of the sound basis for the rejections.

In rejecting claim 25, the examiner took Official Notice that it was commonly known in the art to make a bed sheet at least 90 inches wide. Although that may be true, the applicant contends that it was *not* commonly known in the art to make a bed sheet at least 90 inches wide if the bed sheet comprised a knit fabric a man-made fiber and had a width of greater than 60 inches, as required by independent claim 14 (from which claim 25 depends), due to physical

limitations of the manufacturing process for fabric containing man-made fiber and had an elasticity of the kind recited in independent claim 14. The same argument applies to the Official Notice applied to claims 26 and 34.

All of the dependent claims are patentable for at least similar reasons as those for the claims on which they depend are patentable.

Canceled claims, if any, have been canceled without prejudice or disclaimer.

Any circumstance in which the applicant has (a) addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.

Please apply $1400 for the Petition for Extension of Time fee, excess claim fees and any other charges or credits to deposit account 06-1050, referencing attorney docket 29712-0002003.

Respectfully submitted,

Date: January 17, 2014

/Frank L. Gerratana/
Frank L. Gerratana
Reg. No. 62,653

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23134169.doc

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|---|---|---|---|
| Applicant | : Susan Walvius et al. | Art Unit | : 3673 |
| Serial No. | : 13/272,977 | Examiner | : Nicholas F. Polito |
| Filed | : October 13, 2011 | Conf. No. | : 4915 |
| Title | : FABRIC SYSTEM | | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION FOR THREE-MONTH EXTENSION OF TIME UNDER 37 C.F.R. §1.136

Please extend the period for response to the action dated July 17, 2013, for three months to and including January 17, 2014.

The fees in the amount of $1400 are being paid concurrently herewith. In addition, please apply any other necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: January 17, 2014_____

/Frank L. Gerratana/_____
Frank L. Gerratana
Reg. No. 62,653

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23150829.doc

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|---|---|---|---|
| Applicant | : Susan Walvius et al. | Art Unit | : 3673 |
| Serial No. | : 13/272,977 | Examiner | : Nicholas F. Polito |
| Filed | : October 13, 2011 | Conf. No. | : 4915 |
| Title | : FABRIC SYSTEM | | |

**MAIL STOP AMENDMENT**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-SB-08 or Disclosure Form. Non-patent literature is enclosed.

This statement is being filed after a first Office action on the merits, but before receipt of a final Office action or a Notice of Allowance. The fees in the amount of $180 in payment of the late submission fee of 37 CFR §1.17(p) are being paid concurrently herewith. In addition, please apply any other necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: January 17, 2014

/Frank L. Gerratana/
Frank L. Gerratana
Reg. No. 62,653

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23150832.doc

| Substitute Disclosure Form | U.S. Department of Commerce Patent and Trademark Office | Attorney Docket No. 29712-0002003 | Application No. 13/272,977 |
|---|---|---|---|
| **Information Disclosure Statement by Applicant** (Use several sheets if necessary) | | Applicant Susan Walvius et al. | |
| (37 CFR §1.98(b)) | | Filing Date October 13, 2011 | Group Art Unit 3673 |

**U.S. Patent Documents**

| Examiner Initial | Desig. ID | Document Number | Publication Date | Patentee | Class | Subclass | Filing Date If Appropriate |
|---|---|---|---|---|---|---|---|

**Foreign Patent Documents or Published Foreign Patent Applications**

| Examiner Initial | Desig. ID | Document Number | Publication Date | Country or Patent Office | Class | Subclass | Translation Yes | Translation No |
|---|---|---|---|---|---|---|---|---|

**Other Documents (include Author, Title, Date, and Place of Publication)**

| Examiner Initial | Desig. ID | Document |
|---|---|---|
| | 1 | Chinese Office Action with English translation from corresponding Chinese Application No. 200980147643.6 issued May 17, 2013 (35 pages). |
| | 2 | Long, Hairu, "Knitting Technology", English translation included, China Textile & Apparel Press, 1st Edition, pages 12-13, June 2008 (9 pages). |
| | 3 | Response to Office Action dated May 27, 2013 in Canadian Application No. 2738658, filed with the Office on June 17, 2013 (20 pages). |
| | 4 | Response to Chinese Office Action with English translation from Chinese Application No. 200980147643.6 issued May 17, 2013, filed September 1, 2013 (7 pages). |
| | 5 | Chinese Office Action with English translation from Chinese Application 200980147643.6 issued December 6, 2013 (10 pages). |

| Examiner Signature | Date Considered |
|---|---|
| EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. | |

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 13272977 |
| **Filing Date:** | 13-Oct-2011 |
| **Title of Invention:** | Fabric System |
| **First Named Inventor/Applicant Name:** | Susan Walvius |
| **Filer:** | Frank L. Gerratana/jennifer franco |
| **Attorney Docket Number:** | 29712-0002003 |

Filed as Large Entity

## Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| **Post-Allowance-and-Post-Issuance:** | | | | |
| **Extension-of-Time:** | | | | |
| Extension - 3 months with $0 paid | 1253 | 1 | 1400 | 1400 |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Miscellaneous:** | | | | |
| Submission- Information Disclosure Stmt | 1806 | 1 | 180 | 180 |
| | | **Total in USD ($)** | | **1580** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 17950402 |
| **Application Number:** | 13272977 |
| **International Application Number:** | |
| **Confirmation Number:** | 4915 |
| **Title of Invention:** | Fabric System |
| **First Named Inventor/Applicant Name:** | Susan Walvius |
| **Customer Number:** | 26161 |
| **Filer:** | Frank L. Gerratana/jennifer franco |
| **Filer Authorized By:** | Frank L. Gerratana |
| **Attorney Docket Number:** | 29712-0002003 |
| **Receipt Date:** | 17-JAN-2014 |
| **Filing Date:** | 13-OCT-2011 |
| **Time Stamp:** | 16:30:01 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | Deposit Account |
| Payment was successfully received in RAM | $1580 |
| RAM confirmation Number | 3494 |
| Deposit Account | 061050 |
| Authorized User | |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 1 | | response.pdf | 102305<br>7de6f299bec4a862866ea582d17859df3cb55919 | yes | 13 |

| | Multipart Description/PDF files in .zip description | | |
|---|---|---|---|
| | **Document Description** | **Start** | **End** |
| | Amendment/Req. Reconsideration-After Non-Final Reject | 1 | 1 |
| | Claims | 2 | 9 |
| | Applicant summary of interview with examiner | 10 | 10 |
| | Applicant Arguments/Remarks Made in an Amendment | 11 | 13 |

| | | | | | |
|---|---|---|---|---|---|
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Extension of Time | ext.pdf | 46759<br>ddca9b5ba35e22542b7d23e2d896b4d8d790070a | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Transmittal Letter | IDS.pdf | 62437<br>8a1dc7055fbca5efb68c9a4d5bb3092b5b155c39 | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 4 | Information Disclosure Statement (IDS) Form (SB08) | 1449.pdf | 91873<br>49fe782fbc4ef07d59283388b860ef0711e3da8e | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| This is not an USPTO supplied IDS fillable form | | | | | |
| 5 | Non Patent Literature | 2CN1_OA2_5_17_13.pdf | 4245926<br>796f0e2231a8d3ec521db0df25c1ec51bce31dc4f | no | 35 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 6 | Non Patent Literature | Long.pdf | 2689369<br>9c48b8cff886a0e97f7f9e0cb71db430c8989f5b | no | 9 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 7 | Non Patent Literature | 2CN1-Resp-OA-8-27-13.pdf | 648155<br>47cf4b35e016cfe04bca553f26ac4f6a8d881f94 | no | 7 |

| | | | | | |
|---|---|---|---|---|---|
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 8 | Non Patent Literature | 2CN1_OA3_12-6-12.pdf | 862481<br>1b6378ecda6710500b326a05ad290fab3dee00d5 | no | 10 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 9 | Non Patent Literature | 2CA1_ROA_6_17_13.pdf | 1598972<br>956a7691668ae8b054618d88a1170c151ab33970 | no | 20 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 10 | Fee Worksheet (SB06) | fee-info.pdf | 31893<br>c478d3aade9edb64bcf738f59b949e58a3ba32aa | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | | **Total Files Size (in bytes):** | 10380170 | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE


| PATENT APPLICATION FEE DETERMINATION RECORD<br>Substitute for Form PTO-875 | Application or Docket Number<br>13/272,977 | Filing Date<br>10/13/2011 | ☐ To be Mailed |
|---|---|---|---|

**ENTITY**: ☒ LARGE ☐ SMALL ☐ MICRO

## APPLICATION AS FILED – PART I

| FOR | (Column 1) NUMBER FILED | (Column 2) NUMBER EXTRA | RATE ($) | FEE ($) |
|---|---|---|---|---|
| ☐ BASIC FEE (37 CFR 1.16(a), (b), or (c)) | N/A | N/A | N/A | |
| ☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m)) | N/A | N/A | N/A | |
| ☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | N/A | N/A | N/A | |
| TOTAL CLAIMS (37 CFR 1.16(i)) | minus 20 = | * | X $ = | |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | minus 3 = | * | X $ = | |
| ☐ APPLICATION SIZE FEE (37 CFR 1.16(s)) | If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). | | | |
| ☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | | | |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | TOTAL | |

## APPLICATION AS AMENDED – PART II

| AMENDMENT | 01/17/2014 | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | RATE ($) | ADDITIONAL FEE ($) |
|---|---|---|---|---|---|---|---|
| | Total (37 CFR 1.16(i)) | * 61 | Minus | ** 28 | = 33 | X $80 = | 2640 |
| | Independent (37 CFR 1.16(h)) | * 4 | Minus | ***4 | = 0 | X $420 = | 0 |
| | ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | |
| | ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | |
| | | | | | | TOTAL ADD'L FEE | **2640** |

| AMENDMENT | | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | RATE ($) | ADDITIONAL FEE ($) |
|---|---|---|---|---|---|---|---|
| | Total (37 CFR 1.16(i)) | * | Minus | ** | = | X $ = | |
| | Independent (37 CFR 1.16(h)) | * | Minus | *** | = | X $ = | |
| | ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | |
| | ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | |
| | | | | | | TOTAL ADD'L FEE | |

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/DEBRA R. WYATT/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 13/272,977 | 10/13/2011 | Susan Walvius | 29712-0002003 | 4915 |

26161 7590 10/25/2013

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

| EXAMINER | |
|---|---|
| POLITO, NICHOLAS F | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3673 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 10/25/2013 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

| Applicant-Initiated Interview Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 13/272,977 | WALVIUS ET AL. | |
| | Examiner | Art Unit | |
| | Nicholas Polito | 3673 | |

All participants (applicant, applicant's representative, PTO personnel):

(1) *Nicholas Polito*. (3)_____.

(2) *Frank Gerratana*. (4)_____.

Date of Interview: *21 October 2013*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *14*.

Identification of prior art discussed: *Brooks et al*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

*Applicant called to discuss the Office Action mailed 7/17/2013. Examiner explained that since the prior art uses the same material as applicant's, it would perform similarly. Applicant suggested adding "man-made fiber included in the fabric in a proportion which". Examiner suggested "a panel over 72.5 inches wide comprising a fabric…". Applicant to file a response*.

**Applicant recordation instructions:** The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

**Examiner recordation instructions**: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

| /Nicholas Polito/<br>Examiner, Art Unit 3673 | |
|---|---|

# Summary of Record of Interview Requirements

**Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record**
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

**Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews**
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

———

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

**Examiner to Check for Accuracy**

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

| Substitute Disclosure Form | U.S. Department of Commerce Patent and Trademark Office | Attorney Docket No. 29712-0002003 | Application No. 13/272,977 |
|---|---|---|---|
| **Information Disclosure Statement by Applicant** (Use several sheets if necessary) | | Applicant Susan Walvius et al. | |
| (37 CFR §1.98(b)) | | Filing Date October 13, 2011 | Group Art Unit 3673 |

**U.S. Patent Documents**

| Examiner Initial | Desig. ID | Document Number | Publication Date | Patentee | Class | Subclass | Filing Date If Appropriate |
|---|---|---|---|---|---|---|---|

**Foreign Patent Documents or Published Foreign Patent Applications**

| Examiner Initial | Desig. ID | Document Number | Publication Date | Country or Patent Office | Class | Subclass | Translation Yes | Translation No |
|---|---|---|---|---|---|---|---|---|

**Other Documents (include Author, Title, Date, and Place of Publication)**

| Examiner Initial | Desig. ID | Document |
|---|---|---|
| | 1 | Chinese Office Action with English translation from corresponding Chinese Application No. 200980147643.6 issued May 17, 2013 (35 pages). |
| | 2 | Long, Hairu, "Knitting Technology", English translation included, China Textile & Apparel Press, 1st Edition, pages 12-13, June 2008 (9 pages). |
| | 3 | Response to Office Action dated May 27, 2013 in Canadian Application No. 2738658, filed with the Office on June 17, 2013 (20 pages). |

| Examiner Signature | Date Considered |
|---|---|
| EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. | |

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 13272977 |
| **Filing Date:** | 13-Oct-2011 |
| **Title of Invention:** | Fabric System |
| **First Named Inventor/Applicant Name:** | Susan Walvius |
| **Filer:** | Frank L. Gerratana/jennifer franco |
| **Attorney Docket Number:** | 29712-0002003 |

Filed as Large Entity

## Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| **Post-Allowance-and-Post-Issuance:** | | | | |
| **Extension-of-Time:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Miscellaneous:** | | | | |
| Submission- Information Disclosure Stmt | 1806 | 1 | 180 | 180 |
| | | **Total in USD ($)** | | **180** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 16377352 |
| **Application Number:** | 13272977 |
| **International Application Number:** | |
| **Confirmation Number:** | 4915 |
| **Title of Invention:** | Fabric System |
| **First Named Inventor/Applicant Name:** | Susan Walvius |
| **Customer Number:** | 26161 |
| **Filer:** | Frank L. Gerratana/jennifer franco |
| **Filer Authorized By:** | Frank L. Gerratana |
| **Attorney Docket Number:** | 29712-0002003 |
| **Receipt Date:** | 22-JUL-2013 |
| **Filing Date:** | 13-OCT-2011 |
| **Time Stamp:** | 14:52:07 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | Deposit Account |
| Payment was successfully received in RAM | $180 |
| RAM confirmation Number | 1293 |
| Deposit Account | 061050 |
| Authorized User | |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 1 | Transmittal Letter | IDS.pdf | 50051<br>1784dc2b3258e6bc80366da7bb4dc305dadda933 | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Information Disclosure Statement (IDS) Form (SB08) | 1449.pdf | 71670<br>6eba16c41a37f8fe5cbdf9e51ee207139469045d | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| This is not an USPTO supplied IDS fillable form | | | | | |
| 3 | Non Patent Literature | 2CN1_OA2_5_17_13.pdf | 4245926<br>796f0e2231a8d3ec521db0d25c1ec51bce31dc4f | no | 35 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 4 | Non Patent Literature | Long.pdf | 2689369<br>9c48b8cff886a0e97f7f9e0cb71db430c8989f5b | no | 9 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 5 | Non Patent Literature | 2CA1_ROA_6_17_13.pdf | 1598972<br>956a769166Bae8b054618d88a1170c151ab33970 | no | 20 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 6 | Fee Worksheet (SB06) | fee-info.pdf | 29690<br>8628bd4173884d2ac3fd66c430d988f06e0995ed | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 8685678 | | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|---|---|---|---|
| Applicant | : Susan Walvius et al. | Art Unit | : 3673 |
| Serial No. | : 13/272,977 | Examiner | : Nicholas F. Polito |
| Filed | : October 13, 2011 | Conf. No. | : 4915 |
| Title | : FABRIC SYSTEM | | |

**MAIL STOP AMENDMENT**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-SB-08 or Disclosure Form. Non-patent literature is enclosed.

This statement is being filed after a first Office action on the merits, but before receipt of a final Office action or a Notice of Allowance. The fees in the amount of $180 in payment of the late submission fee of 37 CFR §1.17(p) are being paid concurrently herewith. In addition, please apply any other necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: July 19, 2013_____

/Frank L. Gerratana/_____
Frank L. Gerratana
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Facsimile: (877) 769-7945

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 13/272,977 | 10/13/2011 | Susan Walvius | 29712-0002003 | 4915 |

26161 7590 07/17/2013
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

| EXAMINER | |
|---|---|
| POLITO, NICHOLAS F | |
| ART UNIT | PAPER NUMBER |
| 3673 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 07/17/2013 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

| Office Action Summary | Application No. 13/272,977 | Applicant(s) WALVIUS ET AL. | |
|---|---|---|---|
| | Examiner Nicholas Polito | Art Unit 3673 | AIA (First Inventor to File) Status No |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *30 November 2012*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

5)☒ Claim(s) *14-41* is/are pending in the application.

5a) Of the above claim(s) *38-40* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *14-37 and 41* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

**Application Papers**

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

**Certified copies:**

a)☐ All b)☐ Some * c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 14-24, 27-33, 35-37 and 41 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Brooks et al. (U.S. Patent No. 6,883,193) in view of Taniguchi et al. (U.S. Pub. No. 2005/0132754).

3. Regarding claim 14, Brooks et al. teaches in Figure 1 a bed sheet comprising a fabric of a man-made fiber, the fabric having an elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference, and the fabric having higher breathability, higher heat transfer, and higher moisture wicking characteristics than a cotton fabric (col. 2, line 32 – col. 9, line 11 & MPEP 2112.01).

Brooks et al. does not teach the fabric having been knit at 17 gauges or higher. Taniguchi et al. teaches in paragraphs 21, 22 and 35 a bed sheet having been circularly knit at 17 gauges or higher. In view of Taniguchi et al., it would have been obvious to a person having ordinary skill in the art at the time the invention was made to circularly knit the fabric of Brooks et al. at 17 gauges or higher, as in Taniguchi et al., to increase softness, elasticity and flexibility.

4. Regarding claim 15, Brooks et al. teaches in Figure 1 the bed sheet of claim 14 wherein the fabric comprises a finished fabric comprising: a first circular knitted fabric portion (12); and a second circular knitted fabric portion (14); at least one of the fabric portions comprising a performance fabric portion; the first and second fabric portions being discrete and joined to form the finished fabric (col. 2, line 32 - col. 9, line 11).

5. Regarding claim 16, Brooks et al. teaches in Figure 1 the bed sheet of claim 14, comprising piping (16, 18).

6. Regarding claim 17, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 15, wherein the first and second fabric portions have different fabric characteristics.

7. Regarding claim 18, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 17, wherein at least one of the fabric characteristics comprises moisture management (see also MPEP 2112.01).

8. Regarding claim 19, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 14 in which the fabric is knit of the man-made fiber.

9. Regarding claim 20, Taniguchi et al. teaches in paragraphs 21, 22 and 35 the bed sheet of claim 14 in which the fabric has a gauge of at least 17 gauges.

10. Regarding claim 21, the bed sheet of claim 14 in which the fabric is circularly knit.

11. Regarding claim 22, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 14 being stretchable to fit either a baby crib and an adult bed.

12. Regarding claim 23, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 14 that is sufficiently stretchable to fit a standard rectangular bed and a smaller, non-rectangular marine bed.

13. Regarding claim 24, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 14 that is sufficiently stretchable to fit either a crib or a standard adult bed.

14. Regarding claim 27, Brooks et al. in view of Taniguchi et al. teaches the bed sheet of claim 14. Brooks et al. in view of Taniguchi et al. does not teach a pull tie that can be cinched to increase tension around an edge of the bed sheet. The examiner takes Official Notice that it is commonly known in the art to provide a pull tie to the edge of a bed sheet in order to cinch and increase the tension around the edge.

15. Regarding claim 28, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 17, wherein at least one of the fabric characteristics is UV protection (see also MPEP 2112.01).

16. Regarding claim 29, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 17, wherein at least one of the fabric characteristics is anti-microbial fabric (see also MPEP 2112.01).

17. Regarding claim 30, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 17, wherein at least one of the fabric characteristics is thermo-regulation (see also MPEP 2112.01).

18. Regarding claim 31, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 17, wherein at least one of the fabric characteristics is wind resistance (see also MPEP 2112.01).

19. Regarding claim 32, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 17, wherein at least one of the fabric characteristics is water resistance (see also MPEP 2112.01).

20. Regarding claim 33, Brooks et al. teaches in Figure 1 a bed sheet comprising a fabric including a high performance man-made fiber, the fabric having an elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference (col. 2, line 32 – col. 9 line 11 & MPEP 2112.01).

Brooks et al. does not teach wherein the fabric is circularly knit at 17 gauges or higher. Taniguchi et al. teaches in paragraphs 21, 22 and 35 a bed sheet having been circularly knit at 17 gauges or higher. In view of Taniguchi et al., it would have been obvious to a person having ordinary skill in the art at the time the invention was made to circularly knit the fabric of Brooks et al. at 17 gauges or higher, as in Taniguchi et al., to increase softness, elasticity and flexibility.

21. Regarding claim 35, Brooks et al. teaches in Figure 1 the bed sheet of claim 33 in which the bed sheet comprises at least two portions (12, 14) of the circularly knit fabric.

22. Regarding claim 36, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 33 in which the fabric comprises polyurethanepolyurea copolymer fiber.

23. Regarding claim 37, Brooks et al. teaches in column 2, line 32 to column 9, line 11 the bed sheet of claim 36 in which the polyurethanepolyurea copolymer fiber is included in the fabric in a proportion such that, if circularly knit at a high gauge, the fabric could be knit at no more than a 72.5 inch circumference without losing integrity of the polyurethanepolyurea copolymer fiber (see also MPEP 2112.01).

24. Regarding claim 41, Brooks et al. teaches in Figure 1 a bed sheet comprising a fabric of a man-made fiber, the fabric having an elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference, and the fabric having higher breathability, higher heat transfer, and higher moisture wicking characteristics than a cotton fabric (col. 2, line 32 – col. 9 line 11 & MPEP 2112.01).

Brooks et al. does not teach a circularly knit fabric having a gauge of at least 17 gauges. Taniguchi et al. teaches in paragraphs 21, 22 and 35 a bed sheet having been circularly knit at 17 gauges or higher. In view of Taniguchi et al., it would have been obvious to a person having ordinary skill in the art at the time the invention was made to circularly knit the fabric of Brooks et al. at 17 gauges or higher, as in Taniguchi et al., to increase softness, elasticity and flexibility.

25. Claims 14, 25, 26 and 33 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Stewart (U.S. Patent No. 7,240,383) in view of Taniguchi et al. (U.S. Pub. No. 2005/0132754).

26. Regarding claim 14, Stewart teaches in Figures 1-4 a bed sheet comprising a fabric (40) of a man-made fiber, the fabric having an elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference, and the fabric having higher breathability, higher heat transfer, and higher moisture wicking characteristics than a cotton fabric (col. 2, line 60 – col. 3, line 18 & MPEP 2112.01).

Stewart does not teach the fabric having been knit at 17 gauges or higher. Taniguchi et al. teaches in paragraphs 21, 22 and 35 a bed sheet having been knit at 17 gauges or higher. In view of Taniguchi et al., it would have been obvious to a person having ordinary skill in the art at the time the invention was made to knit the fabric of Stewart at 17 gauges or higher, as in Taniguchi et al., to increase softness, elasticity and flexibility.

27. Regarding claim 25, Stewart in view of Taniguchi et al. teaches the bed sheet of claim 14. Stewart does not teach wherein the bed sheet is at least 90 inches wide. The examiner takes Official Notice that it is commonly known in the art to make a bed sheet at least 90 inches wide. It would have been an obvious matter of design choice to make the bed sheet of Stewart at least 90 inches wide, since such a modification would have involved a mere change in the size of a component. A change in size is generally

recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

28. Regarding claim 26, Stewart in view of Taniguchi et al. teaches the bed sheet of claim 14. Stewart does not teach wherein the bed sheet has dimensions of approximately 102 inches in length and approximately 91 inches in width. The examiner takes Official Notice that it is commonly known in the art to make a bed sheet approximately 102 inches in length and approximately 91 inches in width. It would have been an obvious matter of design choice to make the bed sheet of Stewart approximately 102 inches in length and approximately 91 inches in width, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

29. Regarding claim 33, Stewart teaches in Figures 1-4 a bed sheet comprising a fabric (40) circularly knit including a high performance man-made fiber, the fabric having an elasticity such that the fabric has a tendency to sag by an amount that is greater than a threshold amount of sag determined by a finishing process, such that the sag would interfere with the finishing process if the fabric were circularly knit at greater than a 72.5 inch circumference (col. 2, line 60 – col. 3, line 18 & MPEP 2112.01).

Stewart does not teach the fabric having been knit at 17 gauges or higher. Taniguchi et al. teaches in paragraphs 21, 22 and 35 a bed sheet having been knit at 17 gauges or higher. In view of Taniguchi et al., it would have been obvious to a person having ordinary skill in the art at the time the invention was made to knit the fabric of

Stewart at 17 gauges or higher, as in Taniguchi et al., to increase softness, elasticity and flexibility.

30. Regarding claim 34, Stewart in view of Taniguchi et al. teaches the bed sheet of claim 33. Stewart does not teach wherein the bed sheet is at least 90 inches wide. The examiner takes Official Notice that it is commonly known in the art to make a bed sheet at least 90 inches wide. It would have been an obvious matter of design choice to make the bed sheet of Stewart at least 90 inches wide, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

***Double Patenting***

31. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the claims at issue are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*,

686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit http://www.uspto.gov/forms/. The filing date of the application will determine what form should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

32. Claims 14-37 and 41 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1, 2, 4-8, 26-30 and 32-36 of Application No. 12/569,659 and claims 1-19 of U.S. Patent No. 8,402,580. Although the claims at issue are not identical, they are not patentably distinct from each other because they recite similar limitations.

***Response to Arguments***

33. Applicant's arguments with respect to claims 14-37 and 41 have been considered but are moot because of the new grounds of rejection.

***Conclusion***

34. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

a. Agarwall (U.S. Patent No. 8,171,581)

b. Rock (U.S. Patent No. 7,428,772) – See Figs. 35 & 36

c. Link et al. (U.S. Pub. No. 2007/0283493)

d. Ellis et al. (U.S. Patent No. 7,176,419)

e. Stewart (U.S. Pub. No. 2005/0284189)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas Polito whose telephone number is (571)270-5923. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Cuomo can be reached on (571) 272-6856. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nicholas Polito/
Examiner, Art Unit 3673

7/9/2013

| Notice of References Cited | Application/Control No. 13/272,977 | Applicant(s)/Patent Under Reexamination WALVIUS ET AL. | |
|---|---|---|---|
| | Examiner Nicholas Polito | Art Unit 3673 | Page 1 of 1 |

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| * | B | US-2007/0283493 | 12-2007 | Link et al. | 5/483 |
| * | C | US-2005/0132754 | 06-2005 | Taniguchi et al. | 066/202 |
| * | D | US-6,883,193 | 04-2005 | Brooks et al. | 5/497 |
| * | E | US-7,176,419 | 02-2007 | Ellis et al. | 219/528 |
| * | F | US-7,240,383 | 07-2007 | Stewart, Richard | 5/497 |
| * | G | US-8,171,581 | 05-2012 | Agarwall, Arun | 5/497 |
| * | H | US-7,428,772 | 09-2008 | Rock, Moshe | 28/159 |
| | I | US- | | | |
| | J | US- | | | |
| | K | US- | | | |
| | L | US- | | | |
| | M | US- | | | |

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| * | | Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages) |
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 13272977 | WALVIUS ET AL. |
| | **Examiner** | **Art Unit** |
| | NICHOLAS POLITO | 3673 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☒ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 11/09/2011 | 12/21/2011 | 05/22/2012 | 07/09/2013 | | | | | |
| | 1 | - | - | - | - | | | | | |
| | 2 | - | - | - | - | | | | | |
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| | 14 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 15 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 16 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 17 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 18 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 19 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 20 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 21 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 22 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 23 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 24 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 25 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 26 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 27 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 28 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 29 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 30 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 31 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 32 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 33 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 34 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 35 | ÷ | ✓ | ✓ | ✓ | | | | | |
| | 36 | ÷ | ✓ | ✓ | ✓ | | | | | |

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 13272977 | WALVIUS ET AL. |
| | **Examiner** | **Art Unit** |
| | NICHOLAS POLITO | 3673 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☒ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 11/09/2011 | 12/21/2011 | 05/22/2012 | 07/09/2013 | | | | | |
| | 37 | ÷ | O | O | ✓ | | | | | |
| | 38 | ÷ | N | N | N | | | | | |
| | 39 | ÷ | N | N | N | | | | | |
| | 40 | ÷ | N | N | N | | | | | |
| | 41 | ÷ | ✓ | ✓ | ✓ | | | | | |

| Substitute Disclosure Form | U.S. Department of Commerce Patent and Trademark Office | Attorney Docket No. 29712-0002003 | Application No. 13/272,977 |
|---|---|---|---|
| **Information Disclosure Statement by Applicant** (Use several sheets if necessary) | | Applicant Susan Walvius et al. | |
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| | 11 | Transaction history from PAIR of U.S. application no. 12/569,659 as of January 24, 2013. |
| | 12 | Transaction history from PAIR of U.S. application no. 13/271,884 as of January 24, 2013. |
| | 13 | Pending claims for U.S. application no. 12/569,659 as of January 24, 2013. |
| | 14 | Pending claims for U.S. application no. 13/271,884 as of January 24, 2013. |

| Examiner Signature /Nicholas Polito/ | Date Considered 07/09/2013 |
|---|---|
| EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. | |

Substitute Disclosure Form

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.P./

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|---|---|---|
| **Information Disclosure Statement by Applicant** (Use several sheets if necessary) (37 CFR §1.98(b)) | 29712-0002003 | 13/272,977 |
| | Applicant: Susan Walvius et al. | |
| | Filing Date: October 13, 2011 | Group Art Unit: 3673 |

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| Examiner Initial | Desig. ID | Document Number | Publication Date | Country or Patent Office | Class | Subclass | Translation Yes | Translation No |
|---|---|---|---|---|---|---|---|---|

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| Examiner Initial | Desig. ID | Document |
|---|---|---|
| | 2 | Australian office action from Australian application no. 2009296195, mailed March 28, 2013. |

| Examiner Signature | Date Considered |
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| /Nicholas Polito/ | 07/09/2013 |

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| | | Filing Date October 13, 2011 | Group Art Unit 3673 |

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| Examiner Initial | Desig. ID | Document Number | Publication Date | Patentee | Class | Subclass | Filing Date If Appropriate |
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| Examiner Initial | Desig. ID | Document Number | Publication Date | Country or Patent Office | Class | Subclass | Translation Yes | Translation No |
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| | 3 | EP 2601866 | 6/12/2013 | Europe | | | | |
| | 4 | EP 2344691 | 4/10/2013 | Europe | | | | |

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| Examiner Signature /Nicholas Polito/ | Date Considered 07/09/2013 |
|---|---|
| EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. | |

Substitute Disclosure Form

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.P./

| Substitute Form PTO-1449 (Modified) | U.S. Department of Commerce Patent and Trademark Office | Attorney Docket No. 29712-0002003 | Application No. 13/272,977 |
|---|---|---|---|
| **Information Disclosure Statement by Applicant** (Use several sheets if necessary) (37 CFR §1.98(b)) | | Applicant Susan Walvius et al. | |
| | | Filing Date October 13, 2011 | Group Art Unit 3673 |

**U.S. Patent Documents**

| Examiner Initial | Desig. ID | Document Number | Publication Date | Patentee | Class | Subclass | Filing Date If Appropriate |
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**Foreign Patent Documents or Published Foreign Patent Applications**

| Examiner Initial | Desig. ID | Document Number | Publication Date | Country or Patent Office | Class | Subclass | Translation Yes | Translation No |
|---|---|---|---|---|---|---|---|---|

**Other Documents (include Author, Title, Date, and Place of Publication)**

| Examiner Initial | Desig. ID | Document |
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| | 1 | European Communication mailed May 9, 2012 from European application no. 09817024.4 (4 pages). |
| | 2 | Transaction history from PAIR of U.S. application no. 12/569,659 as of May 23, 2012. |
| | 3 | Transaction history from PAIR of U.S. application no. 13/271,884 as of May 23, 2012. |

| Examiner Signature | /Nicholas Polito/ | Date Considered | 07/09/2013 |
|---|---|---|---|

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form (PTO-1449)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.P./

| Search Notes | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 13272977 | WALVIUS ET AL. |
| | Examiner | Art Unit |
| | NICHOLAS POLITO | 3673 |

| CPC- SEARCHED | | |
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| Symbol | Date | Examiner |
| | | |

| CPC COMBINATION SETS - SEARCHED | | |
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| Symbol | Date | Examiner |
| | | |

| US CLASSIFICATION SEARCHED | | | |
|---|---|---|---|
| Class | Subclass | Date | Examiner |
| 5 | 482 - 484, 486, 496, 497, 499 - 502 | 12/21/2011 | NP |
| | Above Search Updated | 5/22/2012 | NP |
| | Above Search Updated | 7/9/2013 | NP |

| SEARCH NOTES | | |
|---|---|---|
| Search Notes | Date | Examiner |
| EAST Search History Attached | 12/21/2011 | NP |
| EAST Search History Attached | 5/22/2012 | NP |
| EAST Search History Attached | 7/9/2013 | NP |

| INTERFERENCE SEARCH | | | |
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| US Class/ CPC Symbol | US Subclass / CPC Group | Date | Examiner |
| | | | |

| /NICHOLAS POLITO/<br>Examiner.Art Unit 3673 | |
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**EAST Search History**

**EAST Search History (Prior Art)**

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| S1 | 1 | 12/569659 or 13/271884 or 13/272977 | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/19 16:46 |
| S2 | 23 | "5"/.clas. and ((circle or circular) adj knit) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/19 16:49 |
| S3 | 118 | ((circle or circular) adj knit) and stitch and (heat adj set) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/19 16:52 |
| S4 | 18 | ((circle or circular) adj knit) same stitch same (heat adj set) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/19 16:52 |
| S5 | 3 | "5"/.clas. and (((circle or circular) adj knit) and stitch and (heat adj set)) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/19 16:57 |
| S6 | 27828 | bedding or (bed near sheet) or (mattress near cover$3) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 14:21 |
| S7 | 1867 | ((circle or circular) adj knit) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 14:21 |
| S8 | 109 | S6 and S7 | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 14:21 |
| S9 | 24359 | (heat-set$4) or (heat adj set$4) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 14:23 |
| S10 | 11 | S6 and S7 and S9 | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 14:24 |
| S11 | 23 | flatlock near stitch$3 | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 14:27 |
| S12 | 0 | (12/162516).APP. | USPAT; USOCR | OR | OFF | 2011/12/20 15:29 |
| S13 | 0 | ("2009/0044338").URPN. | USPAT | OR | OFF | 2011/12/20 15:29 |

| | | | | | | |
|---|---|---|---|---|---|---|
| S14 | 0 | (10/710179).APP. | USPAT; USOCR | OR | OFF | 2011/12/20 15:32 |
| S15 | 1 | ("2005/0284189").URPN. | USPAT | OR | OFF | 2011/12/20 15:33 |
| S16 | 20 | ("4504991" \| "4801493" \| "5279878" \| "5645926" \| "5935882" \| "5972512").PN. OR ("6823548").URPN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/20 15:44 |
| S17 | 10 | 5/482-502.ccls. and ((circle or circular) adj knit) | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/20 15:45 |
| S18 | 12 | 5/482-502.ccls. and ((circle or circular or round) near knit$3) | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/20 15:46 |
| S19 | 8356 | ((circle or circular or round) adj knit$4) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 15:59 |
| S20 | 8586 | ((circle or circular or round) near knit$4) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 15:59 |
| S21 | 165 | S6 and S20 | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 15:59 |
| S22 | 9978 | ((circle or circular or round or jersey or fleece or terry or double) adj knit$4) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 16:12 |
| S23 | 28 | 5/482-502.ccls. and ((circle or circular or round or jersey or fleece or terry or double) adj knit$4) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 16:12 |
| S24 | 281 | 5/482-502.ccls. and knit$4 | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/20 16:22 |
| S25 | 3 | (("5765241") or ("5817391") or ("6381779")).PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/20 18:07 |
| S26 | 2028 | 5/482-484,486,499-502.ccls. | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/20 18:09 |
| S27 | 1 | ((susan near walvius) or (michelle near marciniak)).in. | US-PGPUB; USPAT; USOCR | OR | OFF | 2011/12/20 18:27 |
| S28 | 55 | 5/482-502.ccls. and spandex | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/21 17:24 |
| S29 | 47 | spandex with antimicrobial | US-PGPUB; | OR | ON | 2011/12/21 17:34 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | USPAT; USOCR | | | |
| S30 | 0 | spandex with circumference with gauge | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/21 17:38 |
| S31 | 4 | spandex same circumference same gauge | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/21 17:38 |
| S32 | 0 | (11/759586).APP. | USPAT; USOCR | OR | OFF | 2011/12/21 20:35 |
| S33 | 41 | 5/482-502.ccls. and (antimicrobial or anti-microbial) | US-PGPUB; USPAT; USOCR | OR | ON | 2011/12/21 20:40 |
| S34 | 37 | (US-20110000020-$ or US-20040060120-$ or US-20060046591-$ or US-20080189824-$ or US-20090044338-$ or US-20100088818-$ or US-20050284189-$ or US-20080004395-$ or US-20110208145-$ or US-20030068949-$ or US-20040045955-$ or US-20100304632-$ or US-20070050909-$ or US-20070283493-$ or US-20070174972-$).did. or (US-6192538-$ or US-3996771-$ or US-4794767-$ or US-6776014-$ or US-3906750-$ or US-6823548-$ or US-5950264-$ or US-6910235-$ or US-5450630-$ or US-5784721-$ or US-5867837-$ or US-7743476-$ or US-4504990-$ or US-5651847-$ or US-5948711-$ or US-6028241-$ or US-7268320-$ or US-7856684-$ or US-5503840-$ or US-6015816-$ or US-4690859-$).did. or (US-3187522-$).did. | US-PGPUB; USPAT; USOCR | OR | OFF | 2012/04/02 14:29 |
| S35 | 4 | S34 and gauge | US-PGPUB; USPAT; USOCR | OR | OFF | 2012/04/02 14:29 |
| S36 | 43 | 5/482-502.ccls. and gauge | US-PGPUB; USPAT; USOCR | OR | ON | 2012/05/21 16:12 |
| S37 | 1 | "13271884" | US-PGPUB; USPAT; USOCR | OR | ON | 2012/05/21 16:25 |
| S38 | 4054 | (circle or circular) near2 knit$3 | US-PGPUB; USPAT; USOCR | OR | ON | 2012/05/21 16:28 |
| S39 | 384230 | gauge | US-PGPUB; USPAT; USOCR | OR | ON | 2012/05/21 16:28 |
| S40 | 574970 | bed or mattress | US-PGPUB; USPAT; USOCR | OR | ON | 2012/05/21 16:29 |

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|---|---|---|---|---|---|---|
| S41 | 147 | S38 and S39 and S40 | US-PGPUB; USPAT; USOCR | OR | ON | 2012/05/21 16:29 |
| S42 | 11 | (("2804632") or ("20110000020") or ("20120030874") or ("4648186") or ("5092088") or ("5636380") or ("7117695") or ("20080028523") or ("20070266495") or ("20040172754")).PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2012/05/22 11:38 |
| S43 | 31 | 5/482-484,486,499-502.ccls. and @pd>"20120101" | US-PGPUB; USPAT; USOCR | OR | OFF | 2012/05/22 11:40 |
| S44 | 3 | (("5765241") or ("5817391") or ("6381779")).PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2012/05/22 11:42 |
| S45 | 390 | "5"/.clas. and (spandex or elastene or lycra or coolmax or thermax or thermastat) | US-PGPUB; USPAT; USOCR | OR | ON | 2013/07/08 16:27 |
| S46 | 18 | ("20040172754" \| "20050132754" \| "20070266495" \| "20070283493" \| "20080028523" \| "20110000020" \| "20120030874" \| "2804632" \| "4648186" \| "4690859" \| "5092088" \| "5636380" \| "5765241" \| "5817391" \| "6381779" \| "6823548" \| "7117695").PN. OR ("8402580").URPN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2013/07/08 17:11 |
| S47 | 68 | spandex with gauge | US-PGPUB; USPAT; USOCR | OR | ON | 2013/07/09 20:30 |
| S48 | 50 | "5"/.clas. and ((circle or circular$2) near5 knit$4) | US-PGPUB; USPAT; USOCR | OR | ON | 2013/07/09 20:40 |
| S49 | 31 | ((circle or circular$2) near5 knit$4) same2 (spandex or elastene or lycra or coolmax or thermax or thermastat) same2 (bedding or blanket or mattress) | US-PGPUB; USPAT; USOCR | OR | ON | 2013/07/09 20:48 |
| S50 | 78 | 5/482-484,486,499-502.ccls. and @pd>"20120501" | US-PGPUB; USPAT; USOCR | OR | OFF | 2013/07/09 21:22 |

**EAST Search History (Interference)**

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| **Information Disclosure Statement by Applicant** (Use several sheets if necessary) | | Applicant Susan Walvius et al. | |
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**U.S. Patent Documents**

| Examiner Initial | Desig. ID | Document Number | Publication Date | Patentee | Class | Subclass | Filing Date If Appropriate |
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| Examiner Initial | Desig. ID | Document Number | Publication Date | Country or Patent Office | Class | Subclass | Translation Yes | Translation No |
|---|---|---|---|---|---|---|---|---|
| | 2 | HK 1173055A | 5/10/13 | Hong Kong | | | | |
| | 3 | EP 2601866 | 6/12/2013 | Europe | | | | |
| | 4 | EP 2344691 | 4/10/2013 | Europe | | | | |

**Other Documents (include Author, Title, Date, and Place of Publication)**

| Examiner Initial | Desig. ID | Document |
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| | 5 | Australian office action from Australian application no. 2009296195, mailed March 28, 2013 (5 pages). |
| | 6 | Response with English translation to Chinese Office Action issued November 23, 2012 for Chinese Application no. 200980147643.6, filed April 7, 2013 (36 pages). |
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| | 8 | Office action from Canadian Application no. 2738658 mailed May 27, 2013 (21 pages). |
| | 9 | European Communication from European Application no. 13158245.4, mailed May 22, 2013 (4 pages). |

| Examiner Signature | Date Considered |
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| EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. | |

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# 專利註冊紀錄冊 REGISTER OF PATENTS
## 註冊紀錄冊記項 REGISTER ENTRY

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| 申請編號 Application No. | :13100363.4 |
| 提交日期 Filing date | :10.01.2013 |
| 法律程序所用語文 Language of Proceedings | :En |
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| 中國專利申請提交日期 CN Application Filing Date | :29.09.2009 |

發明名稱 Title
織物系統
FABRIC SYSTEM

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# Fabric system

| | | | |
|---|---|---|---|
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| **Patent Agency Code** | 11105 | **Patent Agent** | qu ying |

**Abstract**

Bedding material including a first fabric section manufactured from performance fabric and having a first and second side; and, a second fabric section attached to the first side of the first fabric section. Additionally, a third fabric section can be attached to the second side of the first fabric section. The first fabric section can be attached to the second fabric section through a flatlock stitch. The first fabric section can include a first zone and a second zone wherein the first zone contains different performance properties from the second zone and the first zone can have thermal or moisture wicking properties.

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[25] En
[21] 13100433.0 [22] 10.01.2013
[86] 15.12.2010 PCT/US2010/060428
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[54] REFRIGERATED CASE DEFROST WATER DRAIN
冷藏柜除霜水排泄裝置
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[21] 13100363.4 [22] 10.01.2013
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[54] FABRIC SYSTEM
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[71] Tong Yang Inc.
70, SEORIN-DONG
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Remarks:
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## (54) Knitted bed sheet

(57) Bed sheet (10) at least 228.6 cm wide including a first circular-knit fabric section manufactured from performance fabric and having a first and second side; and, a second circular-knit fabric section attached to the first side of the first fabric section. Additionally, a third circular-knit fabric section can be attached to the second side of the first fabric section. The first fabric section can be attached to the second fabric section through a flatlock stitch (12). The first fabric section can include a first zone and a second zone wherein the first zone contains different performance properties from the second zone and the first zone can have thermal or moisture wicking properties.

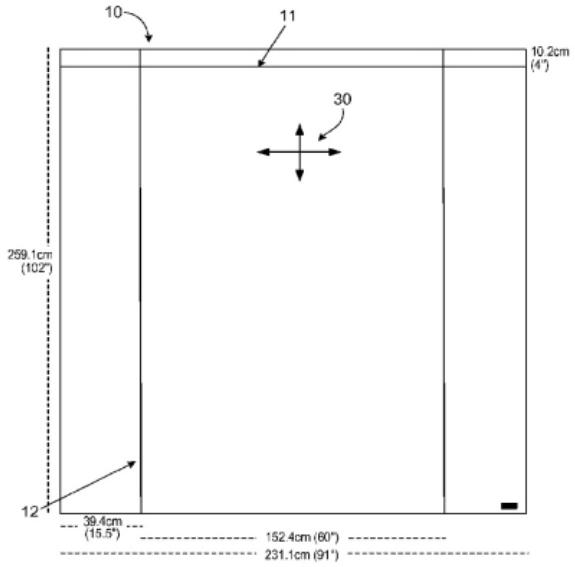


FIG. 1

EP 2 601 866 A1

## Description

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

**[0001]** The present invention relates generally to fabric systems, and more specifically to bed coverings constructed of high gauge circular knitted fabrics that accommodate and maintain optimum thermal conditions for sleep, which in turn can lead to faster sleep initiation and deeper, more restorative sleep.

#### 2. Description of Related Art

**[0002]** Sleep problems in the United States are remarkably widespread, affecting roughly three out of four American adults, according to research by the National Sleep Foundation (NSF). Consequently, a great deal of attention has been paid to the circumstances surrounding poor sleep, along with strategies for how to improve it.

**[0003]** The implications are not merely academic. Sleep - not only the right amount of it but also the right quality - impacts not just day-to-day performance, but also "the overall quality of our lives," according to the NSF. Addressing the causes of poor quality sleep, therefore, has ramifications for millions.

**[0004]** Though many factors contribute to sleep quality, the sleep environment itself plays a critical role, and sleep researchers routinely highlight temperature as one of the most important components in creating an environment for optimal sleep. As advised by the University of Maryland Medical Center, "a cool (not cold) bedroom is often the most conducive to sleep." The National Sleep Foundation further notes that "temperatures above 75 degrees Fahrenheit and below 54 degrees will disrupt sleep," with 65 degrees being the ideal sleep temperature for most individuals, according to the NSF.

**[0005]** A lower environmental temperature is not the only thermal factor associated with improved sleep. Researchers have noted a nightly drop in body temperature among healthy, normal adults during sleep. This natural cycle, when inhibited or not functioning properly, can disrupt sleep and delay sleep onset, according to medical researchers at Cornell University. Conversely, the researchers noted, a rapid decline in body temperature not only accelerates sleep onset but also "may facilitate an entry into the deeper stages of sleep."

**[0006]** Therefore, maintaining an appropriately cool sleep environment and accommodating the body's natural tendency to cool itself at night should be a top priority for individuals interested in optimizing their sleep quality. Performance fabrics crafted into bedding applications would be uniquely capable of promoting cool, comfortable - and therefore better - sleep, as these advanced fabrics maximize breathability and heat transfer. Performance fabrics are made for a variety of end-use applications, and can provide multiple functional qualities, such as moisture management, UV protection, anti-microbial, thermo-regulation, and wind/water resistance.

**[0007]** There has been a long felt need in several industries to provide improved bedding to help individuals get better sleep. Such improved bedding would include beneficial wicking among other properties. For example, in marine, boating and recreational vehicle applications, bedding should resist moisture, fit odd-shaped mattresses and beds, and reduce mildew. Particularly with watercraft, there is a need to protect bedding, and specifically sheets, from moisture and mildew accumulation.

**[0008]** An additional problem with bedding, not just with marine and recreational vehicles, is the sticky, wet feeling that can occur when the bedding sheets are wet due to body sweat, environmental moisture, or other bodily fluids. In particular, when bedding is used during hot weather, or is continuously used for a long time by a person suffering from an illness, problems can arise in that the conventional bed sheet of cotton fiber or the like cannot sufficiently absorb the moisture. All of these issues lead to poor sleep.

**[0009]** To date, performance fabric bedding products are not known. There are width limitations in the manufacturing of high gauge circular knit fabrics, because the finished width of bedding fabrics are dictated by the machine used in its construction. At present, performance fabrics are manufactured with a maximum width of under 90 inches wide, given present manufacturing and technical limitations, along with the inability of alternate manufacturing processes to produce a fabric with identical performance attributes. Yet, normal bed sheet panels can be 102 by 91 inches or larger. Thus, performance fabrics cannot yet be used for bed sheets.

**[0010]** Some conventional solutions for the above issues that hinder a good night's sleep include United States Patent 4,648,186, which discloses an absorbent wood pulp cellulose fiber that is provided in a variety of sizes and is placed under a mattress. The wood pulp is water absorbent and acts to capture moisture to prevent such moisture from being retained by the bedding or the bedding sheets. However, this proposed solution does not interact with the bedding or the bedding sheets, but merely acts as a sponge for moisture that is in proximity to the target bedding.

**[0011]** United States Patent 5,092,088 discloses a sheet-like mat comprised of a mat cover, the inside of which is divided into a plurality of bag-like spaces, and a drying agent packed into a bag and contained in the bag-like spaces in such a manner that the drying agent cannot fall out of the bag-like spaces. A magnesium sulfate, a high polymer absorbent, a silica gel or the like can be used as the drying agent. As can be seen, this proposed solution to moisture in bedding is cumbersome and chemically-based.

**[0012]** In the athletic apparel industry, moisture wicking fabric has been used to construct athletic apparel. For example, United States Patent 5,636,380 discloses a base fabric of CoolmaxQ high moisture evaporation

fabric having one or more insulating panels of ThermaxB or ThermastatQ hollow core fiber fabric having moisture wicking capability and applied to the inner side of the garment for skin contact at selected areas of the body where muscle protection is desired. However, this application cannot be applied to bedding sheets due to the limitations of the size of the performance fabrics manufactured. Further, performance fabric such as this type cannot be easily stitched together as the denier is so fine that stitching this fabric results in the stitching simply falling apart.

**[0013]** Circular knitting is typically used for athletic apparel. The process includes circularly knitting yarns into fabrics. Circular knitting is a form of weft knitting where the knitting needles are organized into a circular knitting bed. A cylinder rotates and interacts with a cam to move the needles reciprocally for knitting action. The yarns to be knitted are fed from packages to a carrier plate that directs the yarn strands to the needles. The circular fabric emerges from the knitting needles in a tubular form through the center of the cylinder. This process is described in United States Patent 7,117,695. However, the machinery presently available for this method of manufacture can only produce a fabric with a maximum width of approximately 90 inches. Therefore, this process has not been known to manufacture sheets, since sheets can have dimensions of 91 inches by 102 inches or greater.

**[0014]** Further, the machinery that is used for bedding is very different than for athletic wear. For example, bedding manufacturing equipment is not equipped to sew flatlock stitching or to provide circular knitting. Bed sheets typically are knit using a process known as warp knitting, a process capable of producing finished fabrics in the widths required for bedding. This method, however, cannot be employed to produce high-quality performance fabrics. Warp knitting is not capable of reproducing these fabrics' fine tactile qualities nor their omni-direction stretch properties, for example.

**[0015]** Circular knitting must be employed to produce a performance fabric that retains these fabric's full range of benefits and advantages. However, in order to produce a fabric of the proper width for bedding applications, a circular knit machine of at least 48 inches in diameter would be necessary. Manufacturing limitations therefore preclude the construction of performance fabrics at proper widths for bedding. The industry is unsure if it could actually knit and then finish performance fabrics at these large sizes, even if the machinery were readily available.

**[0016]** Further, athletic sewing factories are typically not equipped to sew and handle large pieces of fabrics so that equipment limitations do not allow for the manufacture of bedding sheets.

**[0017]** What is needed, therefore, is a bedding system that utilizes performance fabrics and their beneficial properties, the design of which acknowledges and addresses limitations in the manufacture of these fabrics. It is to such a system that the present invention is primarily directed.

## BRIEF SUMMARY OF THE INVENTION

**[0018]** Briefly described, in preferred form, the present invention is a high gauge circular knit fabric for use in bedding, and a method for manufacturing such bedding. The bedding fabric has superior performance properties, while allowing for manufacture by machinery presently available and in use. In order to achieve a finished width of the size needed to create sheet-sized performance fabric, a high gauge circular knit machine of at least 48 inches in diameter is necessary. And while warp knitting machines are available that can produce wider fabrics, this method will not provide a fabric with the tactile qualities required, nor provide a fabric with omni-directional stretch.

**[0019]** In an exemplary embodiment, the present invention is a method of making a finished fabric comprising at least two discrete performance fabric portions, and joining at least two discrete performance fabric portions to form the finished fabric. Forming the at least two discrete performance fabric portions can comprise knitting at least two discrete performance fabric portions, and more preferably, circular knitting at least two discrete performance fabric portions. Joining the at least two discrete performance fabric portions to form the finished fabric can comprise stitching at least two discrete performance fabric portions together to form the finished fabric.

**[0020]** The at least two discrete performance fabric portions can have different fabric characteristics. Fabric characteristics as used herein include, among other things, moisture management, UV protection, anti-microbial, thermo-regulation, wind resistance and water resistance.

**[0021]** The finished fabric can be used in, among other applications, residential settings, or in marine, boating and recreational vehicle environments.

**[0022]** The present sheets offer enhanced drape and comfort compared to traditional cotton bedding, and are as fine as silk, yet provide the benefits of high elasticity and recovery along with superior breathability, body-heat transport, and moisture management as compared to traditional cotton bedding.

**[0023]** Conventional fitted sheets can bunch and slide on standard mattress sizes. Furthermore, if the fitted bed sheets do not fit properly, they do not provide a smooth surface to lie on. The present invention overcomes these issues.

**[0024]** The present high gauge circular knit fabrics stretch to fit and offer superior recovery on the mattress allowing the fabric to conform to fit the mattress without popping off the corners of the mattress or billowing. The performance fabric can include spandex, offers a better fit than conventional bedding products, can accommodate larger or smaller mattress sizes with a single size sheet, and can conform to mattresses with various odd dimensions.

**[0025]** Spandex - or elastane - is a synthetic fiber known for its exceptional elasticity. It is stronger and more

durable than rubber, its major non-synthetic competitor. It is a polyurethane-polyurea copolymer that was invented by DuPont. "Spandex" is a generic name, and an anagram of the word "expands." "Spandex" is the preferred name in North America; elsewhere it is referred to as "elastane." The most famous brand name associated with spandex is Lycra, a trademark of Invista.

**[0026]** The present high gauge circular knit fabric offers durability in reduced pilling and pulling when compared to other knit technologies, and offer reduced wrinkles and enhanced color steadfastness

**[0027]** In a preferred embodiment, the present performance fabric can allow for a one-size fitted sheet that can actually fit two different size mattresses. For example, the full fitted sheet of the present invention can fit on both the full and queen size bed. The twin fitted sheet of the present invention will also fit an XL twin. In a boating application, the present invention can be produced to fit almost every custom boat mattress.

**[0028]** Testing of the present invention conducted at the North Carolina State University (NCSU) Center for Research on Textile Protection and Comfort confirms that the present performance fabrics provide a cooler sleeping environment than cotton. Performance bedding was tested side-by-side with commercially available cotton bed sheets in a series of procedures designed to measure each product's heat- and moisture-transport properties, as well as warm/cool-to-touch thermal transport capabilities.

**[0029]** Across all tests, the present performance fabrics in bedding outperformed cotton, demonstrating the performance fabric's superiority in establishing and maintaining thermal comfort during sleep. This advantage is evident to users from the very onset, as NCSU testing indicates that, on average, performance bedding of the present invention offers improved heat transfer upon initial contact with the skin, resulting in a cooler-to-the-touch feeling.

**[0030]** During sleep, high gauge circular knit performance bedding of the present invention helps to maintain thermal comfort by trapping less body heat and breathing better than cotton. Testing has demonstrated that performance bedding made out of performance fabrics transfers heat away from the body up to two times more effectively than cotton. This is critically important not only for sustained comfort during sleep, but also in terms of enabling the body to cool itself as rapidly as possible to facilitate sleep onset. In addition to trapping less heat, performance bedding breathes better than cotton - up to 50% better, giving performance bedding a strong advantage in terms of ventilation and heat and moisture transfer.

**[0031]** The performance advantage over cotton holds true for simulated dry and wet skin conditions, confirming that certain performance fabrics in bedding are better suited than cotton at managing moisture (e.g., sweat) to maintain thermal comfort. In addition to wicking moisture away from the skin through capillary action, the performance fabric's advanced breathability further enables heat and moisture transfer through evaporative cooling. As a result, the user is kept cooler, drier and more comfortable than with cotton.

**[0032]** The present performance bedding holds a distinct advantage over cotton in enabling, accommodating and maintaining optimum thermal conditions for sleep, which in turn can lead to faster sleep initiation and deeper, more restorative sleep.

**[0033]** These and other objects, features and advantages of the present invention will become more apparent upon reading the following specification in conjunction with the accompanying drawings.

## BRIEF DESCRIPTION OF THE FIGURES

**[0034]**

**Fig. 1** illustrates a preferred embodiment of the present invention.

**Fig. 2** illustrates another preferred embodiment of the present invention.

**Fig. 3** illustrates a further preferred embodiment of the present invention.

**Fig. 4** illustrates another preferred embodiment of the present invention.

## DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

**[0035]** Although preferred embodiments of the invention are explained in detail, it is to be understood that other embodiments are contemplated. Accordingly, it is not intended that the invention is limited in its scope to the details of construction and arrangement of components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced or carried out in various ways. Also, in describing the preferred embodiments, specific terminology will be resorted to for the sake of clarity.

**[0036]** It must also be noted that, as used in the specification and the appended claims, the singular forms "a," "an" and "the" include plural referents unless the context clearly dictates otherwise. For example, reference to a sheet or portion is intended also to include the manufacturing of a plurality of sheets or portions. References to a sheet containing "a" constituent is intended to include other constituents in addition to the one named.

**[0037]** Also, in describing the preferred embodiments, terminology will be resorted to for the sake of clarity. It is intended that each term contemplates its broadest meaning as understood by those skilled in the art and includes all technical equivalents which operate in a similar manner to accomplish a similar purpose.

**[0038]** Ranges may be expressed herein as from "about" or "approximately" one particular value and/or to "about" or "approximately" another particular value. When such a range is expressed, another embodiment includes from the one particular value and/or to the other particular value.

**[0039]** By "comprising" or "containing" or "including" is meant that at least the named compound, element, particle, or method step is present in the composition or article or method, but does not exclude the presence of other compounds, materials, particles, method steps, even if the other such compounds, material, particles, method steps have the same function as what is named.

**[0040]** It is also to be understood that the mention of one or more method steps does not preclude the presence of additional method steps or intervening method steps between those steps expressly identified. Similarly, it is also to be understood that the mention of one or more components in a fabric or system does not preclude the presence of additional components or intervening components between those components expressly identified.

**[0041]** Referring now in detail to the drawing figures, wherein like reference numerals represent like parts throughout the several views, the present invention of **Figs. 1 and 4** provides a sheet **10** shown having dimensions of 102 inches in length and 91 inches in width. The material is manufactured from performance fabric, which can include, for example, varying amounts of one or more of Lycra, Coolmax, Thermax and Thermastat. In a preferred embodiment, the fabric is treated so that the fabric has antimicrobial properties. By using circular-knit performance fabric, the fabric is able to provide elasticity in all four directions. This property allows for the sheet to fit extraordinary mattress, cushion and bedding shapes, as well as providing better fits for traditional rectangular sheets. By using performance fabrics, the sheet has elastic properties that allow stretching in the directions shown as **30.** In addition, by using circular-knit performance fabric, the resulting bedding retains an exceptionally fine tactile quality critical for providing maximum levels of enhanced comfort.

**[0042]** An alternative to circular knitting is non-circular knitting - for example, warp knitting. This method can achieve widths greater than circular knitting. Industrial warp knit machines, for example, can produce tricote warp knit fabrics up to 130-140 inches in width. Circular knitting, however, is less expensive, as it requires less set-up time. Circular knitting also provides greater multi-directional stretch.

**[0043]** In order to provide a sheet that exceeds the maximum dimensions of fabric that can be produced by available circular knitting machines, flat lock stitching **12** is used to join a plurality of portions resulting in a sheet that is 91 inches wide (as shown). In an exemplary embodiment, piping **11** can be included in close proximity to the stitching. The stitching can be the same color as the fabric of the sheet portions, or different color(s). The piping can be 3/4 inch straight piping without a cord or other filler. In one preferred embodiment, the stitching is 16 stitches per inch. Piping **11** can be included at one end of the sheet and can be the same or a different color as the sheet fabric.

**[0044]** For a fitted sheet, the sheet can include an elastic portion surrounding the edge of the fitted sheet to better keep the fitted sheet in place when placed on a mattress or other sleeping surface. A cord can be sewn into the edge of the fitted sheet and cinched around the mattress or other sleeping surface to better hold the fitted sheet in place.

**[0045]** Referring to **Fig. 2,** a sheet is shown having dimensions of 91 inches wide and 102 inches in length. In this embodiment, stitching **14** is shown 34 inches from an interior edge **18** of a main portion **16** and another stitch **14** at edge **20** of the sewn-on portion. Flat lock stitching can be used for the stitching. Piping can be applied at or in proximity to the stitching.

**[0046]** Referring to **Fig. 3,** a non-rectangular shaped sheet is shown. In this exemplary embodiment, elastic can be included around the edge of the fitted sheet to better maintain the fitted sheet in position when placed on a sleeping surface. In one embodiment, pull ties **24** can be installed at various locations around the edge of the fitted sheet in order to assist in maintaining the fitted sheet secured to the sleeping surface. The pull tie can be cinched to increase tension around the edge of the fitted sheet as shown by **26.**

**[0047]** Stitching used for securing the portions of the sheet together can include that shown as **28a.** In another embodiment, the stitching used for securing the portion of fabric together is shown as **28b.**

**[0048]** Referring to **Fig. 4,** yet another preferred embodiment of the invention is shown. In this embodiment, the sheet can be assembled through stitching of differing fabrics for generating performance zones in the sheet. For example, zone **32** can have higher wicking properties than the other zones since this area is where the majority of the individual body rests. Areas **34a** through **34d** can have higher spandex or other elastic fabric properties so that the fit around a sleeping surface is improved. Area **36** may have thermal properties such as increased cooling since this area is generally where the individual's head lies. In an exemplary embodiment, the pillow covers of pillows used by the individual also have differing properties from the remainder of the sheet, e.g., thermal properties.

**[0049]** The present invention encompasses the construction of bedding materials that have superior performance properties while allowing for manufacture by machinery presently available and in use. More specifically, the invention is related to a new method for fabricating a covering and or sheets in bedding. When using the circular knitting machine, the high gauge performance fabrics can only be made to a maximum size of 72.5 inches without losing the integrity of the spandex in the fabric. Yet, normal sheet panels are 102 x 91 inches. This presents problems when manufacturing sheets from per-

formance fabrics.

**[0050]** Additionally, special stitching techniques must be used given the thread density of the fabric. Using this special stitching, panels are sewn together to produce bedding or a sheet that is the proper size for standard bed sheets. Because discrete portions/panels are used in the manufacture of the present fabrics, panels can be selected that provide different properties for different areas of the bedding **(Fig. 4).** Stitching or seams on the sheet can also allow for the ease of making the bed. Because the bedding is made from performance fabric with spandex, it stretches to permit multiple and custom sizing for applications in cribs, recreational vehicles and boats.

**[0051]** Circular knitting machines used for high gauge performance bedding fabrics are called high-gauge circular knitting machines, because of dense knitting with thin yarn. High gauge generally denotes 17 gauges or more. Seventeen gauges indicate that 17 or more cylinder needles are contained in one inch. Circular knitting machines of less than 17 gauges are referred to as low-gauge circular knitting machines. The low-gauge circular knitting machines are often used to knit outerwear.

**[0052]** "Yarn count" indicates the linear density (yarn diameter or fineness) to which that particular yarn has been spun. The choice of yarn count is restricted by the type of knitting machine employed and the knitting construction. The yarn count, in turn, influences the cost, weight, opacity, hand and drape of the resulting knitted structure. In general, staple spun yarns tend to be comparatively more expensive the finer their count, because finer fibers and a more exacting spinning process are necessary in order to prevent the yarn from showing an irregular appearance.

**[0053]** A top width in the 90-inch range is currently possible using a circular knit fabric formed on a 36-38-inch diameter machine, although higher levels of spandex in the performance fabric tend to pull the width in. In just one example, on a 30-inch diameter machine, the spandex can reduce an otherwise 94-inch circumference fabric tube to one with a 60-65 inch finished width.

**[0054]** A major limitation in finished width is not strictly a knitting concern but also concerns finishing. With performance fabric, it tends to sag in the middle - increasingly so with greater widths - making finishing difficult to impossible above a certain threshold. A possible 90-inch finished width is contingent upon having a good finishing set-up capable of handling the present performance fabric. This potential for difficulties would only become compounded at the larger widths required for bed sheets.

**[0055]** In a preferred process, the present fabric undergoes a heat setting finishing process. Applying a moisture-wicking finish to another fabric - like cotton - that can be produced at larger widths appears unlikely to match the moisture-control properties of the present fabric, as polyester itself is naturally moisture-resistant and there are physical actions (e.g. capillary action) at play. Further, the use of cotton comes at the expense of breathability and heat-transfer capabilities (as confirmed by laboratory testing) and stretchability.

**[0056]** Numerous characteristics and advantages have been set forth in the foregoing description, together with details of structure and function. While the invention has been disclosed in several forms, it will be apparent to those skilled in the art that many modifications, additions, and deletions, especially in matters of shape, size, and arrangement of parts, can be made therein without departing from the spirit and scope of the invention and its equivalents as set forth in the following claims. Therefore, other modifications or embodiments as may be suggested by the teachings herein are particularly reserved as they fall within the breadth and scope of the claims here appended.

**[0057]** Although the present invention is defined in the attached claims, it is to be understood that the invention can alternatively also be defined in accordance with the following embodiments:

1. A method of making a finished fabric at least 228.6 cm (90 Inch) wide comprising:

    forming at least two discrete performance fabric portions; and
    joining at least two discrete performance fabric portions to form the finished fabric.

2. The method according to embodiment 1, wherein forming at least two discrete performance fabric portions comprises knitting at least two discrete performance fabric portions.

3. The method according to embodiment 1, wherein forming at least two discrete performance fabric portions comprises circular knitting at least two discrete performance fabric portions.

4. The method according to embodiment 1, wherein joining at least two discrete performance fabric portions to form the finished fabric comprises stitching at least two discrete performance fabric portions together to form the finished fabric.

5. A method of making a finished fabric at least 228.6 cm (90 Inch) wide comprising: circular knitting at least two discrete performance fabric portions; and stitching at least two discrete performance fabric portions together to form the finished fabric.

6. The method according to embodiment 5, wherein the finished fabric comprises a bed sheet.

7. The method according to embodiment 5, further comprising heat setting finishing the finished fabric.

8. The method according to embodiment 5, further comprising providing piping to the finished fabric.

9. A method of making a bed sheet at least 228.6 cm (90 Inch) wide from performance fabric comprising:

circular knitting at least two discrete performance fabric portions;
stitching at least two discrete performance fabric portions together; and
heat setting finishing the stitched at least two discrete performance fabric portions to form the finished bed sheet.

10. The method according to embodiment 9, further comprising providing piping to the finished bed sheet.

11. The method according to embodiment 9, wherein the at least two discrete performance fabric portions have different fabric characteristics.

12. The method according to embodiment 11, wherein fabric characteristics are selected from the group consisting of moisture management, UV protection, anti-microbial, thermo-regulation, wind resistance and water resistance.

13. A finished fabric at least 228.6 cm (90 Inch) wide comprising:

a first circular knitted performance fabric; and
a second circular knitted performance fabric;
wherein the first and second performance fabrics are discrete; and
wherein the first and second performance fabrics are joined to form the finished fabric.

14. The finished fabric of embodiment 13, wherein the finished fabric comprises a bed sheet.

15. The finished fabric of embodiment 13, further comprising piping.

16. The finished fabric of embodiment 13, wherein the first and second performance fabrics have different fabric characteristics.

17. The finished fabric of embodiment 16, wherein fabric characteristics are selected from the group consisting of moisture management, UV protection, anti-microbial, thermo-regulation, wind resistance and water resistance.

## Claims

1. A bed sheet at least 228.6 cm (90 Inch) wide comprising:

a first fabric; and
a second fabric;
wherein the first and second fabrics are discrete and made of performance fabric;
wherein the first and second fabrics are joined to form the bed sheet;
**characterized in that** the first and second fabrics are circular knitted at a gauge of at least 17 gauges.

2. The bed sheet of claim 1, further comprising piping.

3. The bed sheet of claim 1, wherein the first and second performance fabrics have different fabric characteristics.

4. The bed sheet of claim 3, wherein fabric characteristics are selected from the group consisting of moisture management, UV protection, anti-microbial, thermo-regulation, wind resistance and water resistance.

5. The bed sheet of one of the claims 1 to 4, wherein the bed sheet provides superior breathability, body-heat transport, and moisture management as compared to traditional cotton bedding.

6. The bed sheet of one of the claims 1 to 5, wherein the performance fabric has omnidirectional stretch properties.

7. The bed sheet of one of the claims 1 to 6, wherein the performance fabric allows for a one-size fitted bed sheet to fit two different size mattresses.

8. A method of making a bed sheet at least 228.6 cm (90 Inch) wide comprising:

circular knitting at least two discrete performance fabric portions, ; and
stitching at least two discrete performance fabric portions together to form the bed sheet;
wherein the performance fabric portions are knit at a gauge of at least 17 gauges.

9. The method according to claim 8, further comprising heat setting finishing the finished fabric.

10. The method according to claim 8, further comprising providing piping to the finished fabric.

11. The method according to claim 8, wherein the at least two discrete performance fabric portions have different fabric characteristics.

12. The method according to claim 11, wherein fabric characteristics are selected from the group consisting of moisture management, UV protection, anti-

microbial, thermo-regulation, wind resistance and water resistance.

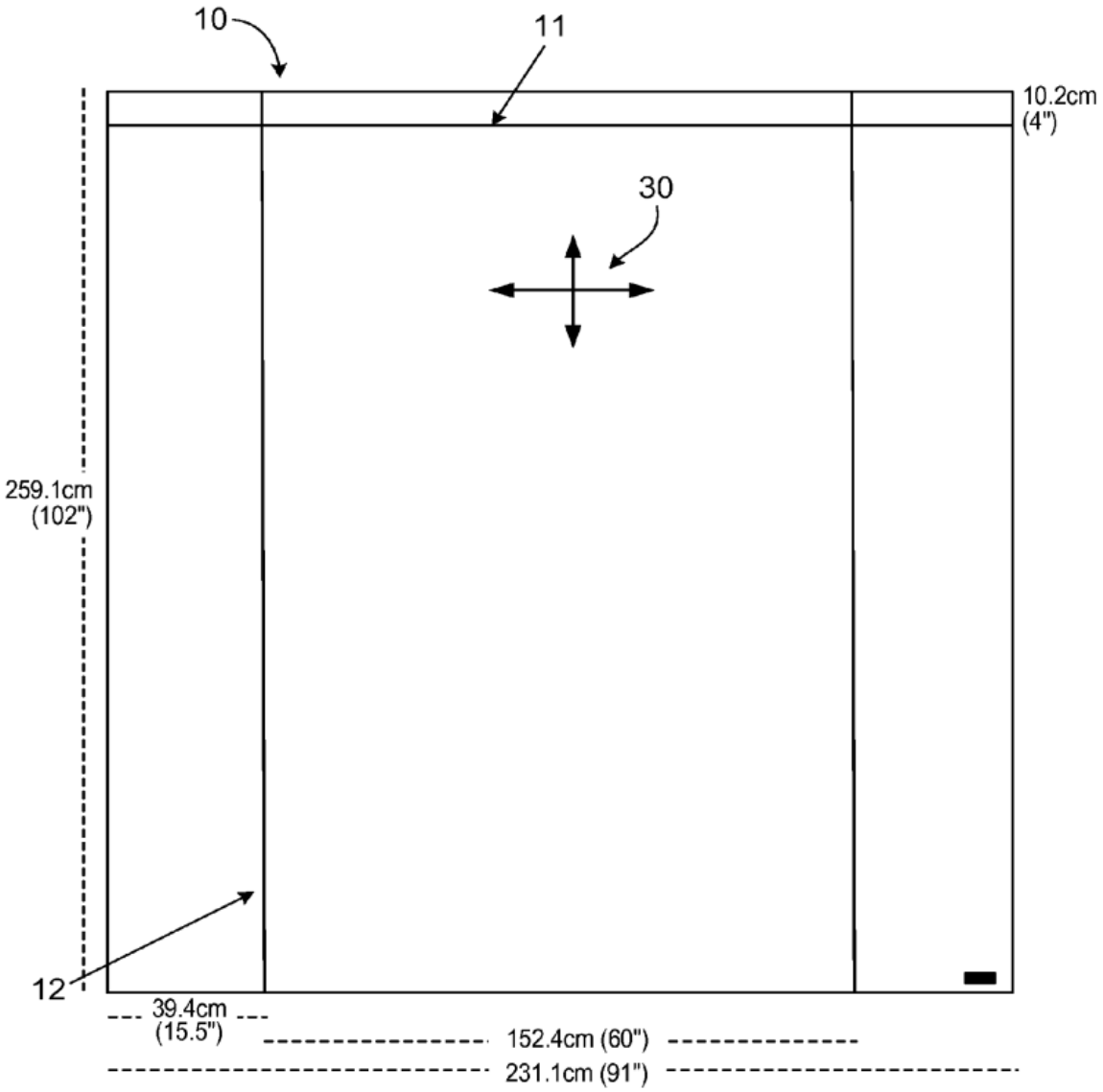


FIG. 1

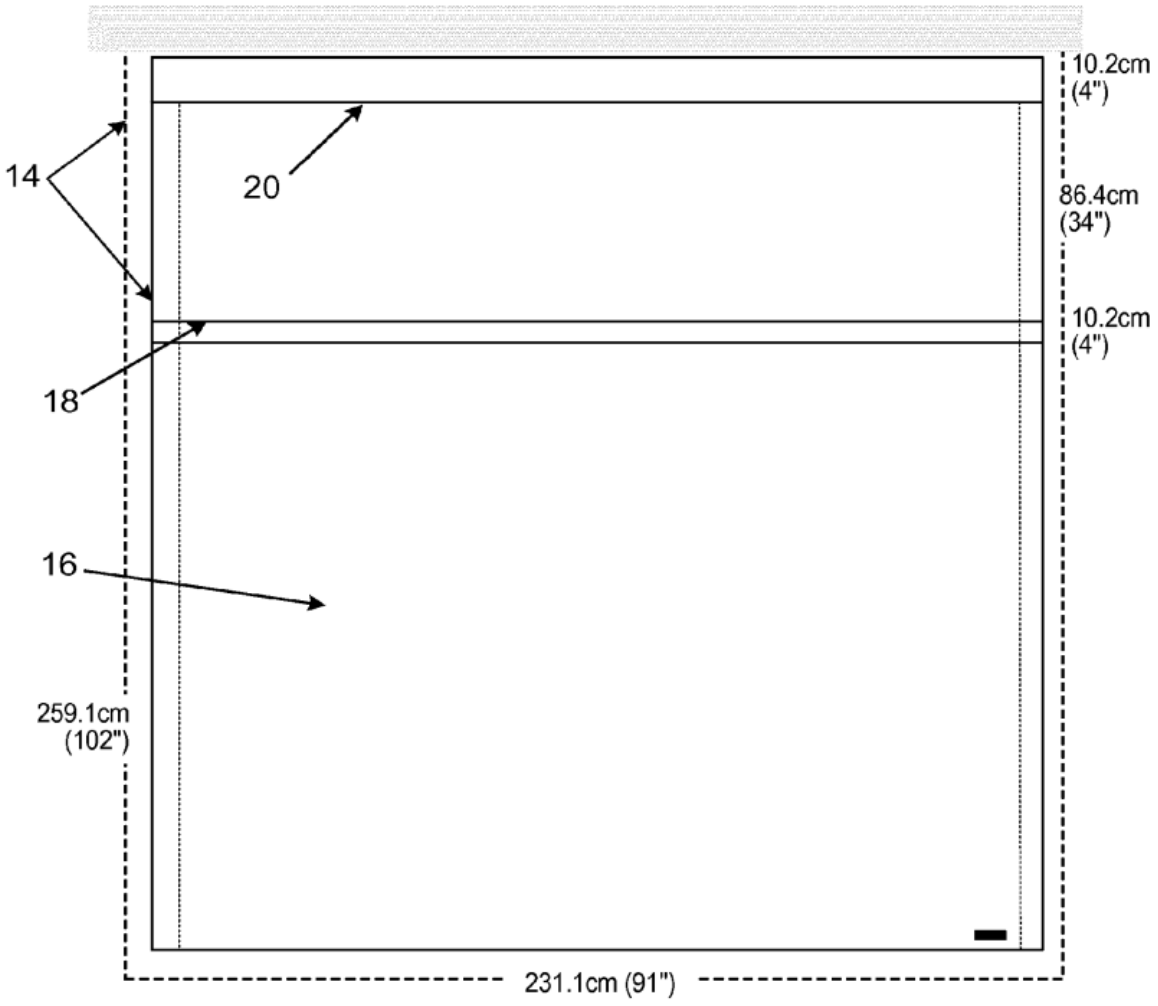


FIG. 2

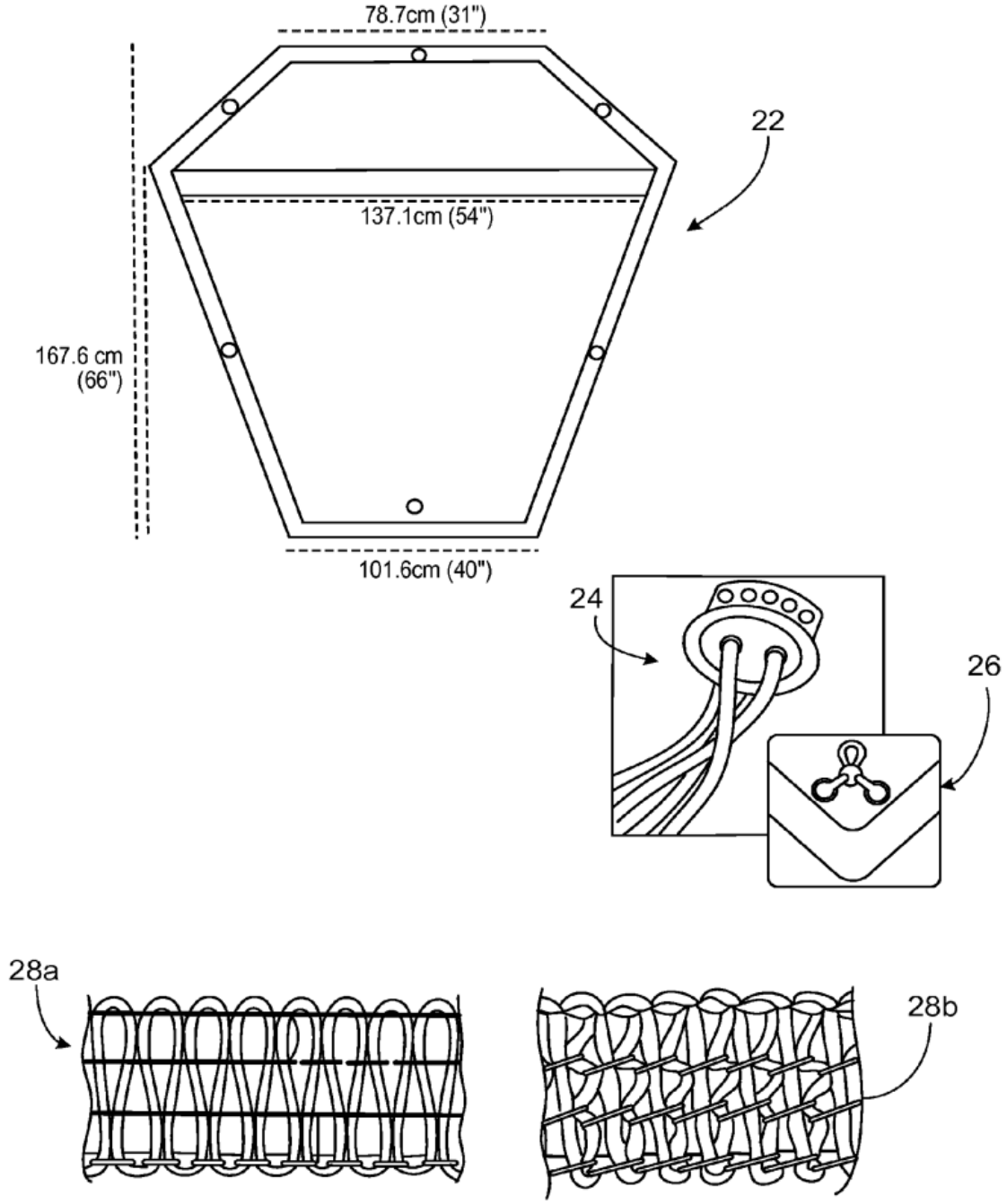


FIG. 3

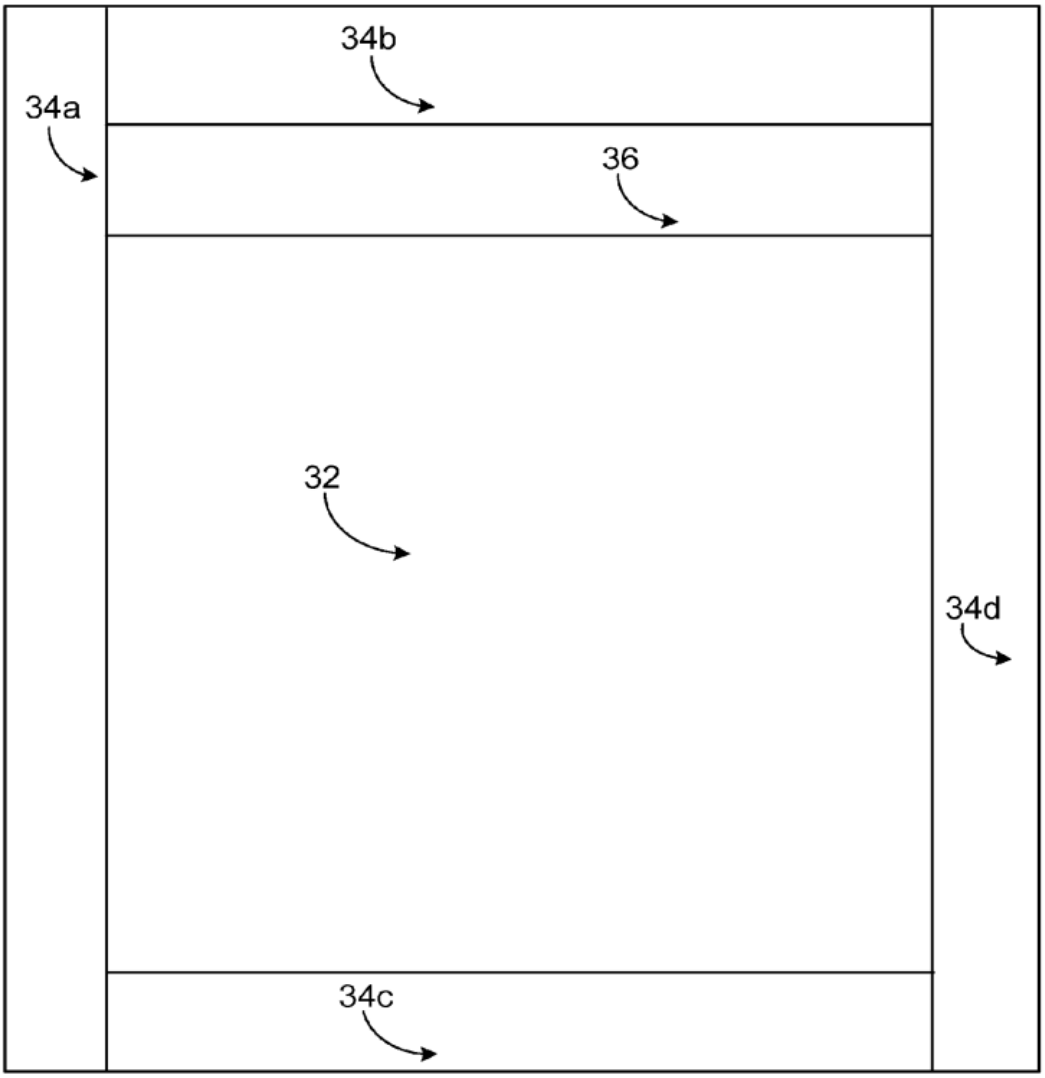


FIG. 4

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# EUROPEAN SEARCH REPORT

Application Number
EP 13 15 8245

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| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
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| | | | TECHNICAL FIELDS SEARCHED (IPC)<br>A47G<br>D04B |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| The Hague | 19 April 2013 | Beugeling, Leo |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 13 15 8245

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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19-04-2013

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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(54) **Knitted bed sheet**

Gestricktes Bettlaken

Drap de lit tricoté

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EP 2 344 691 B1

## Description

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

**[0001]** The present invention relates generally to a bed sheet constructed of high gauge circular knitted fabrics that accommodates and maintains optimum thermal conditions for sleep, which in turn can lead to faster sleep initiation and deeper, more restorative sleep.

#### 2. Description of Related Art

**[0002]** Sleep problems in the United States are remarkably widespread, affecting roughly three out of four American adults, according to research by the National Sleep Foundation (NSF). Consequently, a great deal of attention has been paid to the circumstances surrounding poor sleep, along with strategies for how to improve it.

**[0003]** The implications are not merely academic. Sleep - not only the right amount of it but also the right quality - impacts not just day-to-day performance, but also "the overall quality of our lives," according to the NSF. Addressing the causes of poor quality sleep, therefore, has ramifications for millions.

**[0004]** Though many factors contribute to sleep quality, the sleep environment itself plays a critical role, and sleep researchers routinely highlight temperature as one of the most important components in creating an environment for optimal sleep. As advised by the University of Maryland Medical Center, "a cool (not cold) bedroom is often the most conducive to sleep." The National Sleep Foundation further notes that "temperatures above 24C (75 degrees Fahrenheit) and below 12C (54 degrees) will disrupt sleep," with 18C (65 degrees) being the ideal sleep temperature for most individuals, according to the NSF.

**[0005]** A lower environmental temperature is not the only thermal factor associated with improved sleep. Researchers have noted a nightly drop in body temperature among healthy, normal adults during sleep. This natural cycle, when inhibited or not functioning properly, can disrupt sleep and delay sleep onset, according to medical researchers at Cornell University. Conversely, the researchers noted, a rapid decline in body temperature not only accelerates sleep onset but also "may facilitate an entry into the deeper stages of sleep."

**[0006]** Therefore, maintaining an appropriately cool sleep environment and accommodating the body's natural tendency to cool itself at night should be a top priority for individuals interested in optimizing their sleep quality. Performance fabrics crafted into bedding applications would be uniquely capable of promoting cool, comfortable - and therefore better - sleep, as these advanced fabrics maximize breathability and heat transfer. Performance fabrics are made for a variety of end-use applications, and can provide multiple functional qualities, such as moisture management, UV protection, anti-microbial, thermo-regulation, and wind/water resistance.

**[0007]** There has been a long felt need in several industries to provide improved bedding to help individuals get better sleep. Such improved bedding would include beneficial wicking among other properties. For example, in marine, boating and recreational vehicle applications, bedding should resist moisture, fit odd-shaped mattresses and beds, and reduce mildew. Particularly with watercraft, there is a need to protect bedding, and specifically sheets, from moisture and mildew accumulation.

**[0008]** An additional problem with bedding, not just with marine and recreational vehicles, is the sticky, wet feeling that can occur when the bedding sheets are wet due to body sweat, environmental moisture, or other bodily fluids. In particular, when bedding is used during hot weather, or is continuously used for a long time by a person suffering from an illness, problems can arise in that the conventional bed sheet of cotton fiber or the like cannot sufficiently absorb the moisture. All of these issues lead to poor sleep.

**[0009]** To date, large circular knit performance fabric bed sheets are not known. There are width limitations in the manufacturing of high gauge circular knit fabrics, because the finished width of bedding fabrics are dictated by the machine used in its construction. At present, performance fabrics are manufactured with a maximum width of under 229 cm (90 inches) wide, given present manufacturing and technical limitations, along with the inability of alternate manufacturing processes to produce a fabric with identical performance attributes. Yet, normal bed sheet panels can be 259 by 231 cm (102 by 91 inches) or larger. Thus, performance fabrics cannot yet be used for bed sheets.

**[0010]** Some conventional solutions for the above issues that hinder a good night's sleep include United States Patent 4,648,186, which discloses an absorbent wood pulp cellulose fiber that is provided in a variety of sizes and is placed under a mattress. The wood pulp is water absorbent and acts to capture moisture to prevent such moisture from being retained by the bedding or the bedding sheets. However, this proposed solution does not interact with the bedding or the bedding sheets, but merely acts as a sponge for moisture that is in proximity to the target bedding.

**[0011]** United States Patent 5,092,088 discloses a sheet-like mat comprised of a mat cover, the inside of which is divided into a plurality of bag-like spaces, and a drying agent packed into a bag and contained in the bag-like spaces in such a manner that the drying agent cannot fall out of the bag-like spaces. A magnesium sulfate, a high polymer absorbent, a silica gel or the like can be used as the drying agent. As can be seen, this proposed solution to moisture in bedding is cumbersome and chemically-based.

**[0012]** In the athletic apparel industry, moisture wicking fabric has been used to construct athletic apparel. For example, United States Patent 5,636,380 discloses

a base fabric of CoolmaxQ high moisture evaporation fabric having one or more insulating panels of ThermaxB or ThermastatQ hollow core fiber fabric having moisture wicking capability and applied to the inner side of the garment for skin contact at selected areas of the body where muscle protection is desired. However, this application cannot be applied to bedding sheets due to the limitations of the size of the performance fabrics manufactured. Further, performance fabric such as this type cannot be easily stitched together as the denier is so fine that stitching this fabric results in the stitching simply falling apart.

**[0013]** A fitted bed sheet formed from a circular kaitted fabric is disclosed in US 5765 241A.

**[0014]** Circular knitting is typically used for athletic apparel. The process includes circularly knitting yarns into fabrics. Circular knitting is a form of knitting where the knitting needles are organized into a circular knitting bed. A cylinder rotates and interacts with a cam to move the needles reciprocally for knitting action. The yarns to be knitted are fed from packages to a carrier plate that directs the yarn strands to the needles. The circular fabric emerges from the knitting needles in a tubular form through the center of the cylinder. This process is described in United States Patent 7,117,695. However, the machinery presently available for this method of manufacture can only produce a fabric with a maximum width of approximately 229 cm (90 inches). Therefore, this process has not been known to manufacture sheets having dimensions of 231 cm by 259 cm (91 inches by 102 inches) or greater.

**[0015]** Further, the machinery that is used for bedding is very different than for athletic wear. For example, bedding manufacturing equipment is not equipped to sew flatlock stitching . Bed sheets ean be knit using a flat bed process known as warp knitting, a

**[0016]** process capable of producing finished fabrics in the widths required for bedding. This method, however, cannot be employed to produce high-quality performance fabrics. Warp knitting is not capable of reproducing these fabrics' fine tactile qualities nor their omni-direction stretch properties, for example.

**[0017]** Circular knitting must be employed to produce a performance fabric that retains these fabric's full range of benefits and advantages. However, in order to produce a fabric of the proper width for a large bed sheet, a circular knit machine of at least 122 cm (48 inches) in diameter would be necessary. Manufacturing limitations therefore preclude the construction of a performance fabric at proper width for a large bed sheet. The industry is unsure if it could actually knit and then finish performance fabrics at these large sizes, even if the machinery were readily available.

**[0018]** Further, athletic sewing factories are typically not equipped to sew and handle large pieces of fabrics so that equipment limitations do not allow for the manufacture of bedding sheets.

**[0019]** A Large bed sheet of joined discrete fabrics according to the preamble of 1 is known from US 2008/002813A1.

**[0020]** What is needed, therefore, is a large bed sheet that utilizes circular knitted performance fabric and its beneficial properties, which acknowledges and addresses limitations in the manufacture of the fabric. It is to such a bed sheet that the present invention is primarily directed.

## BRIEF SUMMARY OF THE INVENTION

**[0021]** The present invention is a bed sheet according to present claim 1, and a method for manufacturing a bed sheat according to claim 8. The bed sheet has superior performance properties, while allowing for manufacture by machinery presently available and in use.

**[0022]** The first and second discrete performance fabrics can have different fabric characteristics. Fabric characteristics as used herein include, among other things, moisture management, UV protection, anti-microbial, thermo-regulation, wind resistance and water resistance.

**[0023]** The bed sheet can be used in, among other applications, residential settings, or in marine, boating and recreational vehicle environments.

**[0024]** The present bed sheet offers enhanced drape and comfort compared to traditional cotton bedding, and are as fine as silk, yet provide the benefits of high elasticity and recovery along with superior breathability, body-heat transport, and moisture management as compared to traditional cotton bedding.

**[0025]** The high gauge circular knit fabrics of the present bed sheet stretch to fit and offer superior recovery on the mattress allowing the sheet to conform to fit the mattress without popping off the corners of the mattress or billowing. The performance fabric includes pandex, the bed sheet offers a better fit than conventional bedding products, can accommodate larger or smaller mattress sizes with a single size sheet, and can conform to mattresses with various odd dimensions.

**[0026]** Spandex - or elastane - is a synthetic fiber known for its exceptional elasticity. It is stronger and more durable than rubber, its major non-synthetic competitor. It is a polyurethane-polyurea copolymer that was invented by DuPont. "Spandex" is a generic name, and an anagram of the word "expands." "Spandex" is the preferred name in North America; elsewhere it is referred to as "elastane." The most famous brand name associated with spandex is Lycra, a trademark of Invista.

**[0027]** The present bed sheet comprising gauge circular knit fabric offers durability in reduced pilling and pulling when compared to other knit technologies, and offer reduced wrinkles and enhanced color steadfastness

**[0028]** In a preferred embodiment, a one-size fitted bed sheet can actually fit two different size mattresses. For example, a full fitted bed sheet of the present invention can fit on both a full and queen size bed. A twin fitted bed sheet of the present invention will also fit an XL twin. In a boating application, the present invention can be pro-

duced to fit almost every large boat mattress.

**[0029]** Testing of the present invention conducted at the North Carolina State University (NCSU) Center for Research on Textile Protection and Comfort confirms that the present bed sheet provides a cooler sleeping environment than cotton. Performance bedding was tested side-by-side with commercially available cotton bed sheets in a series of procedures designed to measure each product's heat- and moisture-transport properties, as well as warm/cool-to-touch thermal transport capabilities.

**[0030]** Across all tests, the performance fabrics in bedding outperformed cotton, demonstrating the performance fabric's superiority in establishing and maintaining thermal comfort during sleep. This advantage is evident to users from the very onset, as NCSU testing indicates that, on average, The bed sheet of the present invention offers improved heat transfer upon initial contact with the skin, resulting in a cooler-to-the-touch feeling.

**[0031]** During sleep, a bed sheet of the present invention helps to maintain thermal comfort by trapping less body heat and breathing better than cotton. Testing has demonstrated that a bed sheet made out of performance fabrics transfers heat away from the body up to two times more effectively than cotton. This is critically important not only for sustained comfort during sleep, but also in terms of enabling the body to cool itself as rapidly as possible to facilitate sleep onset. In addition to trapping less heat, the bed sheet breathes better than cotton - up to 50% better, giving a strong advantage in terms of ventilation and heat and moisture transfer.

**[0032]** The performance advantage over cotton holds true for simulated dry and wet skin conditions, confirming that certain bed sheets are better suited than cotton at managing moisture (e.g., sweat) to maintain thermal comfort. In addition to wicking moisture away from the skin through capillary action, the bed sheet's advanced breathability further enables heat and moisture transfer through evaporative cooling. As a result, the user is kept cooler, drier and more comfortable than with cotton.

**[0033]** The present bed sheet holds a distinct advantage over cotton in enabling, accommodating and maintaining optimum thermal conditions for sleep, which in turn can lead to faster sleep initiation and deeper, more restorative sleep.

**[0034]** These and other objects, features and advantages of the present invention will become more apparent upon reading the following specification in conjunction with the accompanying drawings.

## BRIEF DESCRIPTION OF THE FIGURES

**[0035]**

**Fig. 1** illustrates a preferred embodiment of the present invention.

**Fig. 2** illustrates another preferred embodiment of the present invention.

**Fig. 3** illustrates a further preferred embodiment of the present invention.

**Fig. 4** illustrates another preferred embodiment of the present invention.

## DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

**[0036]** Although preferred embodiments of the invention are explained in detail, it is to be understood that other embodiments are contemplated. Accordingly, it is not intended that the invention is limited in its scope to the details of construction and arrangement of components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced or carried out in various ways. Also, in describing the preferred embodiments, specific terminology will be resorted to for the sake of clarity.

**[0037]** It must also be noted that, as used in the specification and the appended claims, the singular forms "a," "an" and "the" include plural referents unless the context clearly dictates otherwise. For example, reference to a sheet or portion is intended also to include the manufacturing of a plurality of sheets or portions. References to a sheet containing "a" constituent is intended to include other constituents in addition to the one named.

**[0038]** Also, in describing the preferred embodiments, terminology will be resorted to for the sake of charity. It is intended that each term contemplates its broadest meaning as understood by those skilled in the art and includes all technical equivalents which operate in a similar manner to accomplish a similar purpose.

**[0039]** Ranges may be expressed herein as from "about" or "approximately" one particular value and/or to "about" or "approximately" another particular value. When such a range is expressed, another embodiment includes from the one particular value and/or to the other particular value.

**[0040]** By "comprising" or "containing" or "including" is meant that at least the named compound, element, particle, or method step is present in the composition or article or method, but does not exclude the presence of other compounds, materials, particles, method steps, even if the other such compounds, material, particles, method steps have the same function as what is named.

**[0041]** It is also to be understood that the mention of one or more method steps does not preclude the presence of additional method steps or intervening method steps between those steps expressly identified. Similarly, it is also to be understood that the mention of one or more components in a fabric or system does not preclude the presence of additional components or intervening components between those components expressly identified.

**[0042]** Referring now in detail to the drawing figures,

wherein like reference numerals represent like parts throughout the several views, the present invention of **Figs. 1 and 4** provides a bed sheet **10** shown having dimensions of 259 cm (102 inches) in length and 231 cm (91 inches) in width. The material is manufactured from performance fabric, which includes Lycra, and for example, varying amounts of one or more of Coolmax, Thermax and Thermastat. In a preferred embodiment, the fabric is treated so that the fabric has antimicrobial properties. By using circular-knit performance fabric, the fabric is able to provide elasticity in all four directions. This property allows for the sheet to fit extraordinary mattress, cushion and bedding shapes, as well as providing better fits for traditional rectangular sheets. By using performance fabrics, the sheet has elastic properties that allow stretching in the directions shown as **30**. In addition, by using circular-knit performance fabric, the resulting bedding retains an exceptionally fine tactile quality critical for providing maximum levels of enhanced comfort.

**[0043]** Circular knitting, is less expensive, as it requires less set-up time. Circular knitting also provides greater multidirectional stretch.

**[0044]** In order to provide a bed sheet that exceeds the maximum dimensions of fabric that can be produced by available circular knitting machines, flat lock stitching **12** is used to join a plurality of portions resulting in a sheet that is 231 cm (91 inches) wide (as shown). In an exemplary embodiment, piping **11** can be included in close proximity to the stitching. The stitching can be the same color as the fabric of the sheet portions, or different color (s). The piping can be 1,9 cm (3/4 inch) straight piping without a cord or other filler. In one preferred embodiment, the stitching is 16 stitches per inch. Piping **11** can be included at one end of the sheet and can be the same or a different color as the sheet fabric.

**[0045]** For a fitted bed sheet, the sheet can include an elastic portion surrounding the edge of the fitted sheet to better keep the fitted sheet in place when placed on a mattress or other sleeping surface. A cord can be sewn into the edge of the fitted sheet and cinched around the mattress or other sleeping surface to better hold the fitted sheet in place.

**[0046]** Referring to **Fig. 2,** a bed sheet is shown having dimensions of 231 cm (91 inched wide and 259 cm (102 inches) in length. In this embodiment, stitching **14** is shown 86 cm (34 inches) from an interior edge **18** of a main portion **16** and another stitch **14** at edge **20** of the sewn-on portion. Flat lock stitching can be used for the stitching. Piping can be applied at or in proximity to the stitching.

**[0047]** Referring to **Fig. 3**, a non-rectangular shaped bed sheet is shown. In this exemplary embodiment, elastic can be included around the edge of the fitted sheet to better maintain the fitted sheet in position when placed on a sleeping surface. In one embodiment, pull ties **24** can be installed at various locations around the edge of the fitted sheet in order to assist in maintaining the fitted sheet secured to the sleeping surface. The pull tie can be cinched to increase tension around the edge of the fitted sheet as shown by **26.**

**[0048]** Stitching used for securing the portions of the sheet together can include that shown as **28a.** In another embodiment, the stitching used for securing the portion of fabric together is shown as **28b.**

**[0049]** Referring to **Fig. 4**, yet another preferred embodiment of the invention is shown. In this embodiment, the bed sheet can be assembled through stitching of differing fabrics for generating performance zones in the sheet. For example, zone **32** can have higher wicking properties than the other zones since this area is where the majority of the individual body rests. Areas **34a** through **34d** can have higher spandex or other elastic fabric properties so that the fit around a sleeping surface is improved. Area **36** may have thermal properties such as increased cooling since this area is generally where the individual's head lies. The pillow covers of pillows used by the individual also have differing properties from the remainder of the sheet, e.g., thermal properties.

**[0050]** The present invention encompasses a bed sheet that has superior performance properties while allowing for manufacture by machinery presently available and in use. Further, the invention is related to a method for making a bed sheet. When using a circular knitting machine, a high gauge performance fabric can only be made to a maximum width of 184cm (72.5 inches) without losing the integrity of the spandex in the fabric. Yet, normal sheet panels are 259 x 231cm (102 x 91 inches). This presents problems when manufacturing a bed sheet from performance fabric.

**[0051]** Additionally, special stitching techniques must be used given the thread density of the fabric. Using this special stitching, panels are sewn together to produce a bed sheet that is the proper size for standard bed sheets. Because discrete fabric portions/panels are used in the manufacture of the present bed sheet, panels can be selected that provide different properties for different areas of the bed sheet (**Fig. 4**). Stitching or seams on the bed sheet can also allow for the ease of making the bed. Because the bed sheet is made from performance fabric with spandex, it stretches to permit multiple and custom sizing for applications in cribs, recreational vehicles and boats.

**[0052]** Circular knitting machines used for high gauge performance bedding fabrics are called high-gauge circular knitting machines, because of dense knitting with thin yarn. High gauge generally denotes 17 gauges or more. Seventeen gauges indicate that 17 or more cylinder needles are contained in one inch. Circular knitting machines of less than 17 gauges are referred to as low-gauge circular knitting machines. The low-gauge circular knitting machines are often used to knit outerwear.

**[0053]** "Yarn count" indicates the linear density (yarn diameter or fineness) to which that particular yarn has been spun. The choice of yarn count is restricted by the type of knitting machine employed and the knitting construction. The yarn count, in turn, influences the cost,

weight, opacity, hand and drape of the resulting knitted structure. In general, staple spun yarns tend to be comparatively more expensive the finer their count, because finer fibers and a more exacting spinning process are necessary in order to prevent the yarn from showing an irregular appearance.

**[0054]** A top width in the 229 cm (90-inch) range is currently possible using a circular knit fabric formed on a 91-97 cm (36-38-inch) diameter machine, although higher levels of spandex in the performance fabric tend to pull the width in. In just one example, on a 76 cm (30-inch) diameter machine, the spandex can reduce an otherwise 239 cm (94-inch) circumference fabric tube to one with a 152-165 cm (60-65) inch) finished width.

**[0055]** A major limitation in finished width is not strictly a knitting concern but also concerns finishing. With performance fabric, it tends to sag in the middle - increasingly so with greater widths - making finishing difficult to impossible above a certain threshold. A possible 229 cm (90-inch) finished width is contingent upon having a good finishing set-up capable of handling the present performance fabric. This potential for difficulties would only become compounded at the larger widths required for bed sheets.

**[0056]** In a preferred process, the present bed sheet undergoes a heat setting finishing process. Applying a moisture-wicking finish to another bed sheet-like cotton - that can be produced at larger widths appears unlikely to match the moisture-control properties of the present bed sheet, as polyester itself is naturally moisture-resistant and there are physical actions (e.g. capillary action) at play. Further, the use of cotton comes at the expense of breathability and heat-transfer capabilities (as confirmed by laboratory testing) and stretchability.

**[0057]** Numerous characteristics and advantages have been set forth in the foregoing description, together with details of structure and function. While the invention has been disclosed in several embodiments, it will be apparent to those skilled in the art that many modifications, additions, and deletions, especially in matters of shape and arrangement of parts, can be made therein without departing from the invention as set forth in the following claims.

## Claims

1. A bed sheet at least 228.6 cm (90 Inch) wide comprising:

   a first fabric; and
   a second fabric;
   wherein the first and second fabrics are discrete and made of performance fabric which includes polynrethanepolynrea copolymere fiber;
   wherein the first and second fabrics are joined to form the bed sheet;
   **characterized in that** the first and second fabrics are circular knitted at a gauge of at least 17 gauges.

2. The bed sheet of claim 1, further comprising piping.

3. The bed sheet of claim 1, wherein the first and second performance fabrics have different fabric characteristics.

4. The bed sheet of claim 3, wherein fabric characteristics are selected from the group consisting of moisture management, UV protection, anti-microbial, thermo-regulation, wind resistance and water resistance.

5. The bed sheet of one of the claims 1 to 4, wherein the bed sheet provides superior breathability, body-heat transport, and moisture management as compared to traditional cotton bedding.

6. The bed sheet of one of the claims 1 to 5, wherein the performance fabric has omnidirectional stretch properties.

7. The bed sheet of one of the claims 1 to 6, wherein the performance fabric allows for a one-size fitted bed sheet to fit two different size mattresses.

8. A method of making a bed sheet at least 228.6 cm (90 Inch) wide comprising:

   circular knitting at least two discrete performance fabric portions, the performance fabric including polyurethanepolyurea copolymere fiber ; and
   stitching at least two discrete performance fabric portions together to form the bed sheet;
   wherein the performance fabric portions are knit at a gauge of at least 17 gauges.

9. The method according to claim 8, further comprising heat setting finishing the bed sheet.

10. The method according to claim 8, further comprising providing piping to the bed sheet.

11. The method according to claim 8, wherein the at least two discrete performance fabric portions have different fabric characteristics.

12. The method according to claim 11, wherein fabric characteristics are selected from the group consisting of moisture management, UV protection, anti-microbial, thermo-regulation, wind resistance and water resistance.

**Patentansprüche**

1. Bettlaken mindestens 228,6 cm (90 Inch) breit, umfassend:

   ein erstes Gewebe; und
   ein zweites Gewebe;
   wobei die ersten und zweiten Gewebe diskret sind und aus Leistungsgewebe hergestellt sind, welches Polyurethan-Polyharnstoff-Copolymer-Fasern beinhaltet;
   wobei die ersten und zweiten Gewebe verbunden sind, um ein Bettlaken zu bilden;
   **dadurch gekennzeichnet, dass** die ersten und zweiten Gewebe rundgewirkt sind mit einer Gauge von mindestens 17 Gauge.

2. Bettlaken nach Anspruch 1, außerdem Paspelierung umfassend.

3. Bettlaken nach Anspruch 1, wobei die ersten und zweiten Leistungsgewebe unterschiedliche Gewebeeigenschaften haben.

4. Bettlaken nach Anspruch 1, wobei Gewebeeigenschaften ausgewählt sind aus einer Gruppe die aus Feuchtigkeitsmanagement, UV Schutz, antimikrobieller Wirkung, Thermoregulation, Windbeständigkeit und Wasserbeständigkeit besteht.

5. Bettlaken nach einem der Ansprüche 1 bis 4, wobei das Bettlaken überdurchschnittliche Atmungsaktivität, Körperwärmetransport und Feuchtigkeitsmanagement verglichen mit herkömmlichen Baumwollbettwaren bietet.

6. Bettlaken nach einem der Ansprüche 1 bis 5, wobei das Leistungsgewebe multidirektionale Ausdehnungseigenschaften hat.

7. Bettlaken nach einem der Ansprüche 1 bis 6, wobei das Leistungsgewebe ein Einheitsformat-Bettlaken ermöglicht, um auf Matratzen mit zwei unterschiedlichen Größen zu passen.

8. Verfahren zum Herstellen eines mindestens 228,6 cm (90 Inch) breiten Bettlakens, umfassend:

   Rundwirken von mindestens zwei diskreten Leistungsgewebe-Teilen, wobei das Leistungsgewebe Polyurethan-Polyharnstoff-Copolymer-Fasern beinhaltet; und
   Zusammennähen von mindestens zwei diskreten Leistungsgewebe-Teilen, um das Bettlaken zu bilden;
   wobei die Leistungsgewebe-Teile mit einer Gauge von mindestens 17 Gauge gewirkt sind.

9. Verfahren gemäß Anspruch 8, außerdem umfassend Appretieren des Bettlakens durch Thermofixieren.

10. Verfahren gemäß Anspruch 8, weiter umfassend Erstellen von Paspelierung an dem Bettlaken.

11. Verfahren gemäß Anspruch 8, wobei die mindestens zwei Leistungsgewebe-Teile unterschiedliche Gewebeeigenschaften haben.

12. Verfahren gemäß Anspruch 11, wobei Gewebeeigenschaften ausgewählt sind aus einer Gruppe die aus Feuchtigkeitsmanagement, UV Schutz, antimikrobieller Wirkung, Thermoregulation, Windbeständigkeit und Wasserbeständigkeit besteht.

**Revendications**

1. Drap de lit d'une largeur d'au moins 228,6 cm (90 pouces), comprenant:

   un premier tissu; et
   un deuxième tissu;
   dans lequel le premier et le deuxième tissus sont discrets et sont constitués de tissu de performance contenant des fibres de copolymère polyuréthane et polyurée;
   dans lequel le premier et le deuxième tissus sont assemblés pour former le drap de lit;
   **caractérisé en ce que** le premier et le deuxième tissus sont tricotés en rond à une jauge d'au moins 17 jauges.

2. Drap de lit selon la revendication 1, comprenant en outre du passepoil.

3. Drap de lit selon la revendication 1, dans lequel le premier et le deuxième tissus de performance présentent des caractéristiques de tissu différentes.

4. Drap de lit selon la revendication 3, dans lequel les caractéristiques des tissus sont sélectionnées dans le groupe composé de la gestion de l'humidité, la protection UV, le caractère anti-microbien, la thermorégulation, la résistance au vent et la résistance à l'eau.

5. Drap de lit selon l'une quelconque des revendications 1 à 4, dans lequel le drap de lit procure une respirabilité, un transport de la chaleur corporelle et une gestion de l'humidité accrus par rapport au linge de lit traditionnel en coton.

6. Drap de lit selon l'une quelconque des revendications 1 à 5, dans lequel le tissu de performance présente des propriétés d'étirement omnidirectionnel-

les.

7. Drap de lit selon l'une quelconque des revendications 1 à 6, dans lequel le tissu de performance permet d'adapter un drap de lit à taille unique à des matelas de différentes tailles.

8. Procédé de fabrication d'un drap de lit d'une largeur d'au moins 228,6 cm (90 pouces), dans lequel:

on tricote en rond au moins deux pièces discrètes de tissu de performance, le tissu de performance contenant des fibres de copolymère polyuréthane et polyurée; et
on coud au moins deux pièces discrètes de tissu de performance l'une à l'autre pour former un drap de lit,
dans lequel les pièces de tissu de performance sont tricotées en rond à une jauge d'au moins 17 jauges.

9. Procédé selon la revendication 8, comprenant en outre la finition du drap de lit par thermofixage.

10. Procédé selon la revendication 8, comprenant en outre la réalisation de passepoil sur le drap de lit.

11. Procédé selon la revendication 8, dans lequel les au moins deux pièces discrètes de tissu de performance présentent des caractéristiques de tissu différentes.

12. Procédé selon la revendication 11, dans lequel on sélectionne les caractéristiques des tissus dans le groupe comprenant la gestion de l'humidité, la protection UV, le caractère anti-microbien, la thermorégulation, la résistance au vent et la résistance à l'eau.

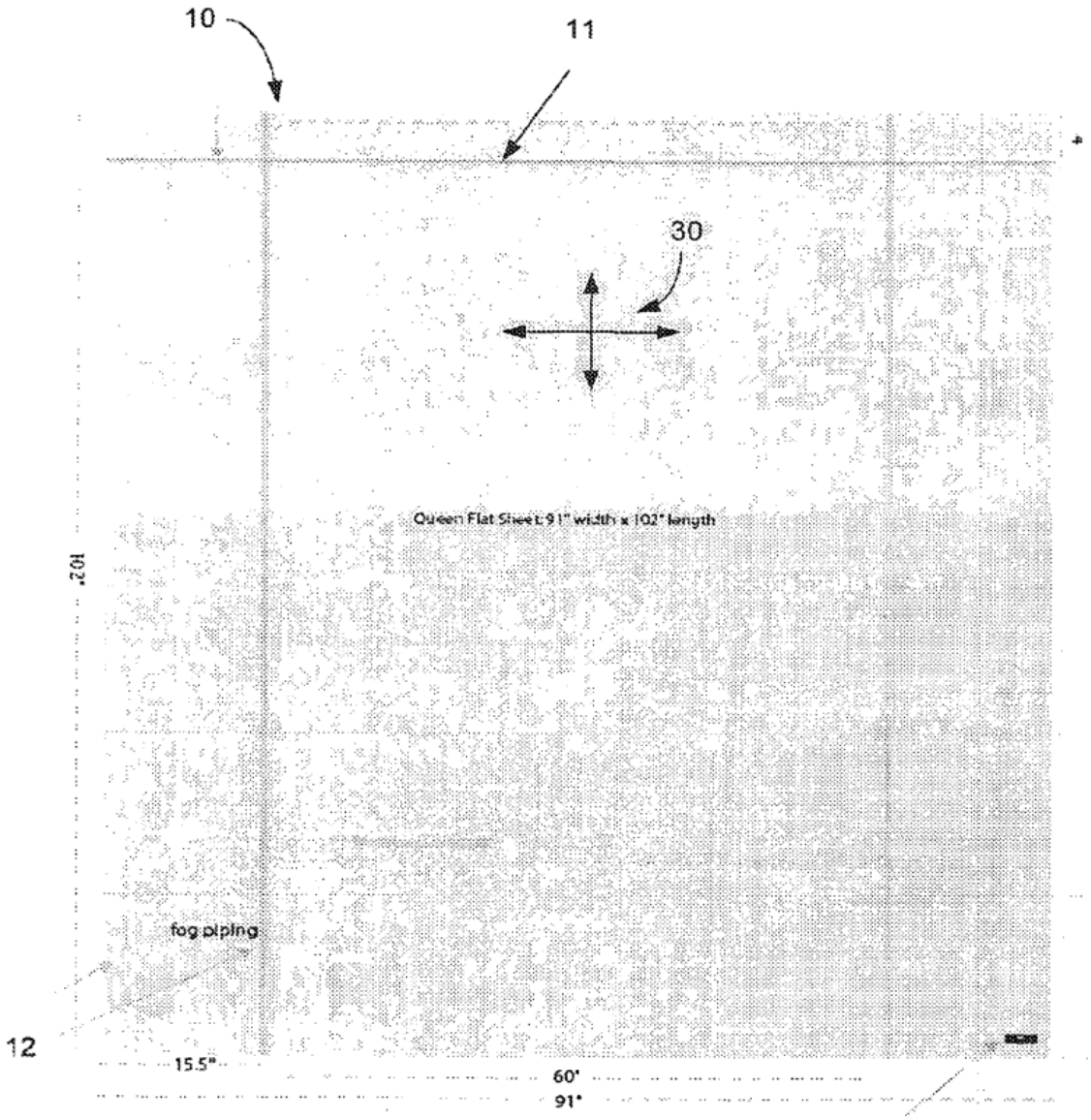
10
11
30
Queen Flat Sheet: 91" width x 102" length
102"
fog piping
12
15.5"
60"
91"

*Fig.1*

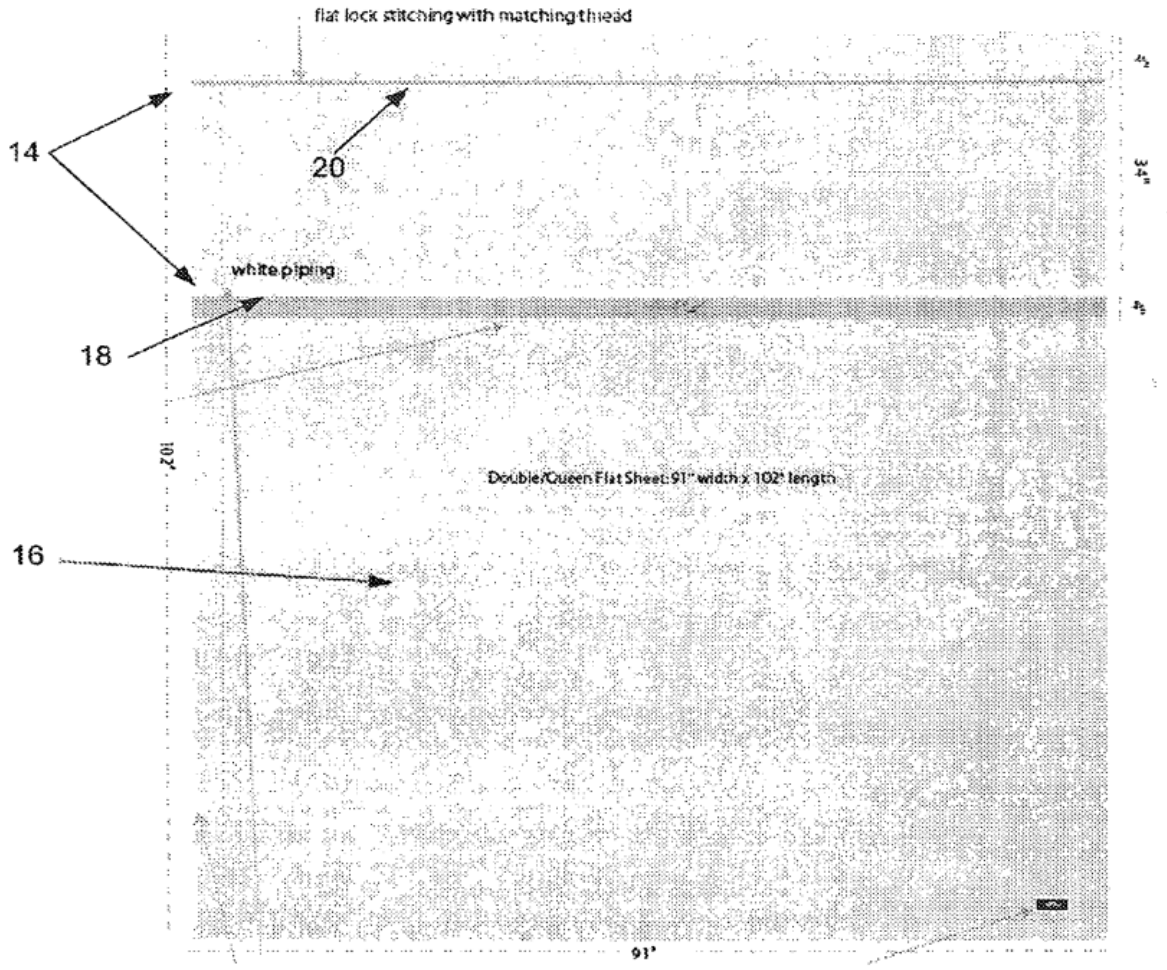
flat lock stitching with matching thread
14
20
white piping
18
16
Double/Queen Flat Sheet: 91" width x 102" length
102"
91"

*Fig.2*

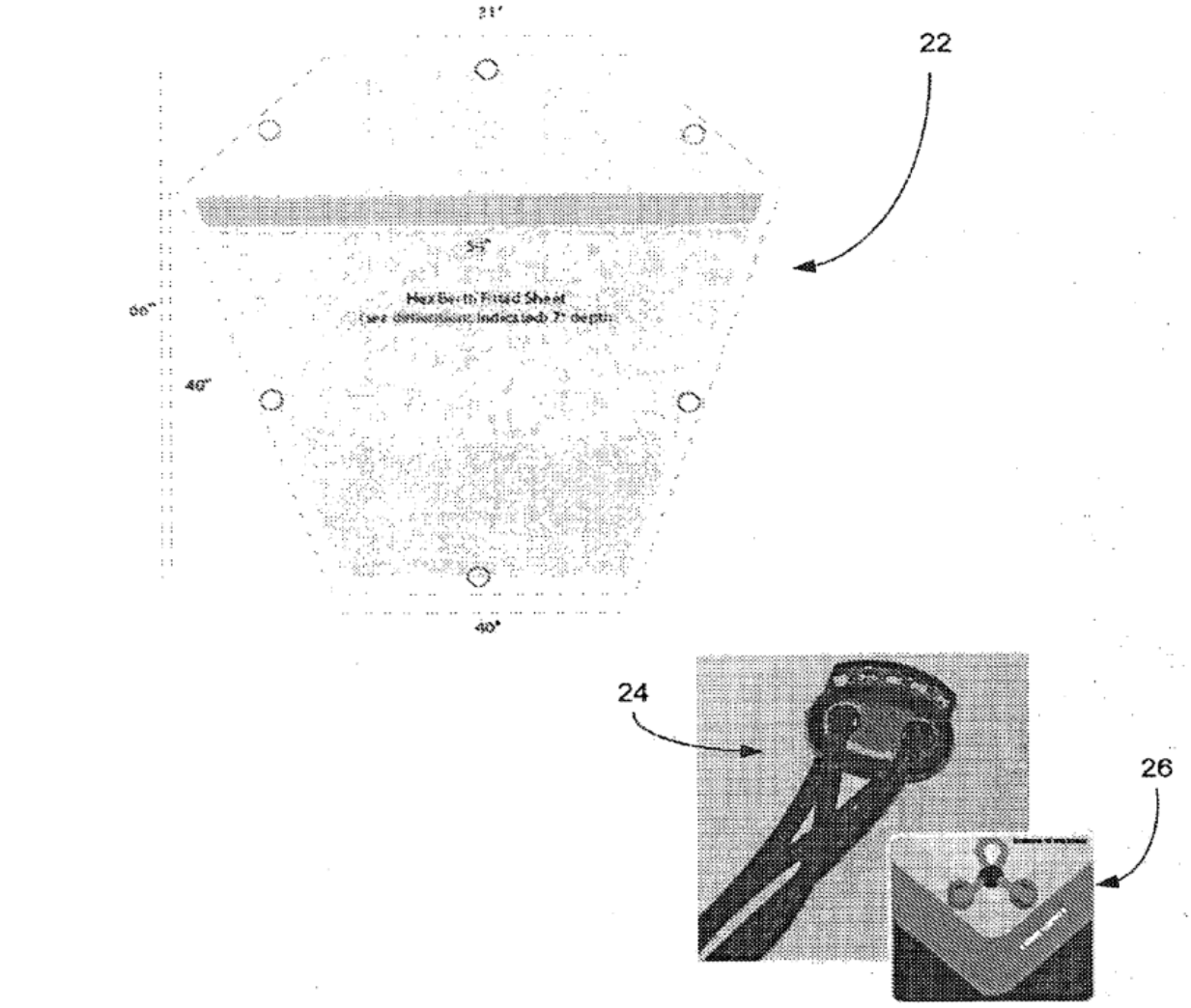


*Fig.3*

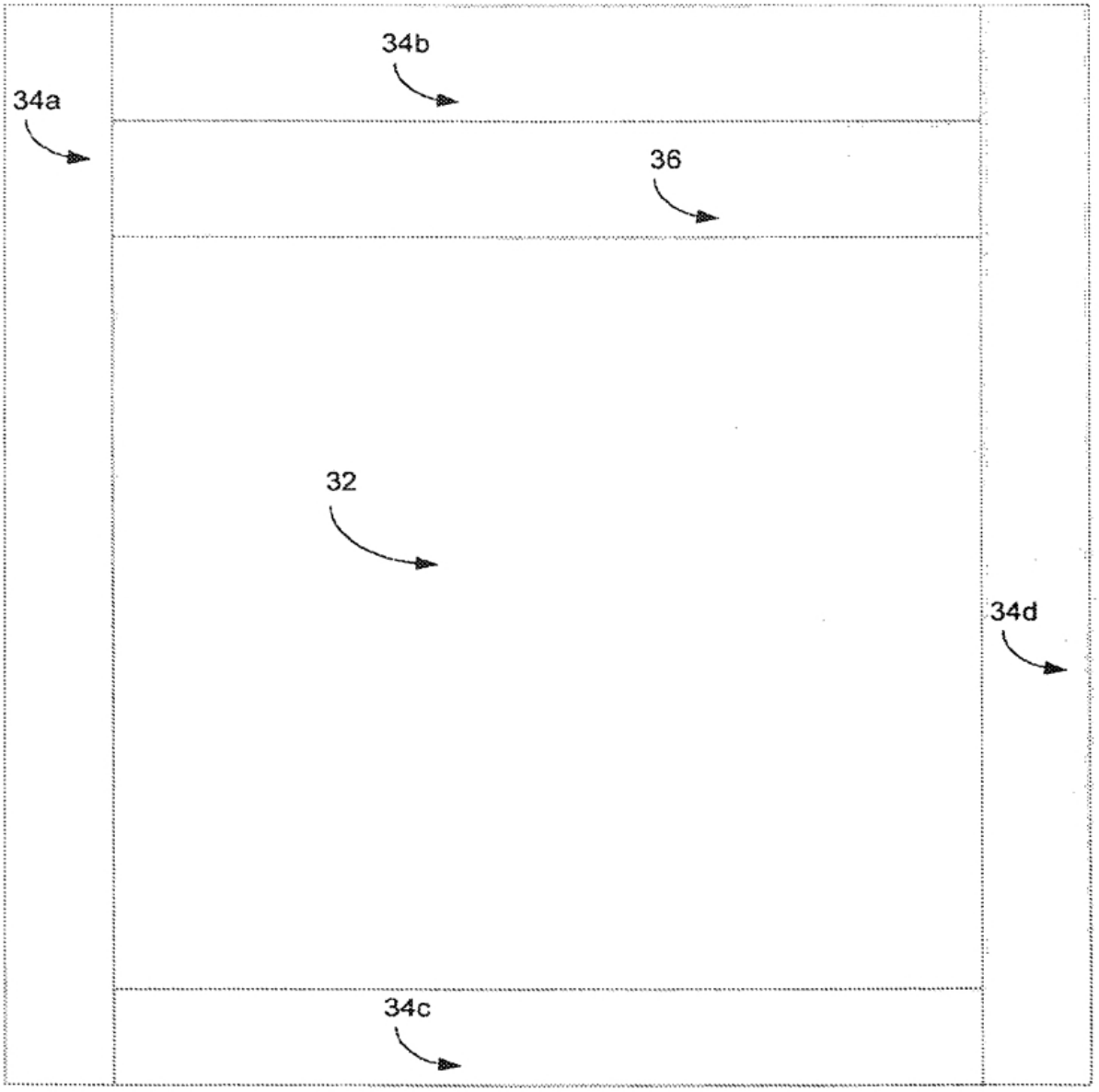


*Fig.4*

## REFERENCES CITED IN THE DESCRIPTION

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# Electronic Acknowledgement Receipt

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|---|---|
| **EFS ID:** | 16023725 |
| **Application Number:** | 13272977 |
| **International Application Number:** | |
| **Confirmation Number:** | 4915 |
| **Title of Invention:** | Fabric System |
| **First Named Inventor/Applicant Name:** | Susan Walvius |
| **Customer Number:** | 26161 |
| **Filer:** | Frank L. Gerratana/jennifer franco |
| **Filer Authorized By:** | Frank L. Gerratana |
| **Attorney Docket Number:** | 29712-0002003 |
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| **Filing Date:** | 13-OCT-2011 |
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| **Application Type:** | Utility under 35 USC 111(a) |

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## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Transmittal Letter | ids.pdf | 49168<br>a6fec30cb9e2da2c1c49e8fabdca8ae2ae68b4e9 | no | 1 |

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| **Warnings:** | |
| **Information:** | |

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| 2 | Information Disclosure Statement (IDS) Form (SB08) | 1449.pdf | 70217<br>3f2758a10b53306225deae40cf539708625e5ae3 | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| This is not an USPTO supplied IDS fillable form | | | | | |
| 3 | Foreign Reference | HK1173055A.pdf | 644612<br>a698b370bfc0439bb8aee522a808793bb26392e7 | no | 4 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 4 | Foreign Reference | EP2601866-A1.pdf | 229528<br>d5e4c4bdd9f7dfb67aa5e6e2122d1476eeb3da16c | no | 15 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 5 | Foreign Reference | EP2344691_B1-4-10-13.pdf | 398566<br>829d2ad79080e82c5fc6dae48f72ae02d62bde9d | no | 13 |
| **Warnings:** | | | | | |
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| 6 | Non Patent Literature | 2AU1_OA_3_28_13.pdf | 1843992<br>915914f88e7a1477177fef799b670f53fa5f44be | no | 5 |
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| **Warnings:** | | | | | |
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| 8 | Non Patent Literature | 2EP2_searchreport_4_25_13.pdf | 2345418<br>a29b592681a36a933f0aec1ec62cbfc20821c998 | no | 38 |
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| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 10 | Non Patent Literature | 2EP2-EPCOMM-5-22-13.pdf | 143361<br>6776c64db405e579d3f4c25f5017a044a643327b | no | 4 |

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**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|---|---|---|---|
| Applicant | : Susan Walvius et al. | Art Unit | : 3673 |
| Serial No. | : 13/272,977 | Examiner | : Nicholas F. Polito |
| Filed | : October 13, 2011 | Conf. No. | : 4915 |
| Title | : FABRIC SYSTEM | | |

**MAIL STOP AMENDMENT**
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Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-SB-08 or Disclosure Form. Foreign patent documents and non-patent literature are enclosed; cited U.S. patents and patent application publications will be provided on request.

This statement is being filed after a request for continued examination and before the mailing of a first Office Action. Please apply any necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: June 12, 2013_____

/Frank L. Gerratana/_____
Frank L. Gerratana
Reg. No. 62,653

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| Substitute Disclosure Form | U.S. Department of Commerce Patent and Trademark Office | Attorney Docket No. 29712-0002003 | Application No. 13/272,977 |
|---|---|---|---|
| **Information Disclosure Statement by Applicant** (Use several sheets if necessary) | | Applicant Susan Walvius et al. | |
| (37 CFR §1.98(b)) | | Filing Date October 13, 2011 | Group Art Unit 3673 |

**U.S. Patent Documents**

| Examiner Initial | Desig. ID | Document Number | Publication Date | Patentee | Class | Subclass | Filing Date If Appropriate |
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| | 1 | 8,402,580 | 3/26/13 | Walvius et al. | | | |

**Foreign Patent Documents or Published Foreign Patent Applications**

| Examiner Initial | Desig. ID | Document Number | Publication Date | Country or Patent Office | Class | Subclass | Translation Yes | Translation No |
|---|---|---|---|---|---|---|---|---|

**Other Documents (include Author, Title, Date, and Place of Publication)**

| Examiner Initial | Desig. ID | Document |
|---|---|---|
| | 2 | Australian office action from Australian application no. 2009296195, mailed March 28, 2013. |

| Examiner Signature | Date Considered |
|---|---|
| EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. | |

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| **EFS ID:** | 15588541 |
| **Application Number:** | 13272977 |
| **International Application Number:** | |
| **Confirmation Number:** | 4915 |
| **Title of Invention:** | Fabric System |
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| **Filer Authorized By:** | Frank L. Gerratana |
| **Attorney Docket Number:** | 29712-0002003 |
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|---|---|---|---|---|---|
| 1 | | IDS.pdf | 119127<br>f6c10efdfb89aa0966cc600325deb17d9ee21612 | yes | 2 |