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 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).

43. 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.

44. 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.

45. 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.

46. 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.

47. 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 is at least 72.5 inches wide.

48. 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.

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

50. 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.

51. 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.

52. 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).

53. Claim 27 is 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. Claims 15, 20, 21, 41 and 44-48 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Gretsinger Taniguchi et al.

56. Regarding claim 15, Gretsinger teaches in column 5, lines 28 to 57 the bed sheet of claim 14 wherein the fabric comprises a finished fabric at least 90 inches wide comprising: a first fabric portion; and a second fabric portion ("band could be configured as a series of smaller, intermittent or spaced apart panels"); at least one of the fabric portions comprising a performance fabric portion (col. 6, lines 12-32); and the first and second fabric portions being discrete and joined to form the finished fabric.

Gretsinger does not specify the at least one of the first and second fabric portions being circularly knit. Taniguchi et al. teaches in paragraphs 21, 22 and 35 a bed sheet having been circularly knit. 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 portions of Gretsinger, as in Taniguchi et al., to increase softness, elasticity and flexibility.

57. Regarding claim 20, Gretsinger teaches the bed sheet of claim 14. Gretsinger does not specify in which 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 connector band (32) of Gretsinger at 17 gauges or higher, as in Taniguchi et al., to increase softness, elasticity and flexibility.

58. Regarding claim 21, Gretsinger teaches the bed sheet of claim 14. Gretsinger does not specify in which the fabric is circularly knit. Taniguchi et al. teaches in paragraphs 21, 22 and 35 a bed sheet having been circularly knit. 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 connector band (32) of Gretsinger, as in Taniguchi et al., to increase softness, elasticity and flexibility.

59. Regarding claim 41, Gretsinger teaches in Figures 6 and 7 a bed sheet having a width of greater than 72.5 inches (king size) comprising a man-made fiber (col. 6, lines 12-32), 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 (MPEP 2112.01 [inherent properties of spandex]). *The standard dimensions for a king size flat sheet are 108" x 102". Gretsinger teaches a flat sheet (34) and use on a king size bed (col. 5, lines 53-57).*

Gretsinger does not specify 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 connector band (32) of Gretsinger at 17 gauges or higher, as in Taniguchi et al., to increase softness, elasticity and flexibility.

60. Regarding claim 44, Gretsinger teaches in column 5, lines 53 to 57 the bed sheet of claim 41 that is at least 90 inches wide.

61. Regarding claim 45, Gretsinger teaches in column 5, lines 53 to 57 the bed sheet of claim 41 having dimensions of approximately 102 inches in length and approximately 91 inches in width.

62. Regarding claim 46, Gretsinger teaches in Figure 7 the bed sheet of claim 41 comprising an element (38) that can be cinched to increase tension around an edge of the bed sheet.

63. Regarding claim 47, Gretsinger teaches in column 6, lines 12 to 32 the bed sheet of claim 41 in which the fabric comprises polyurethanepolyurea copolymer fiber.

64. Regarding claim 48, Gretsinger teaches in column 6, lines 12 to 32 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.

Allowable Subject Matter

65. Claims 17, 18, 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.

Response to Arguments

66. Applicant's arguments filed 9/25/2014 have been fully considered but they are not persuasive. Applicant stated that “examiner indicated that claims directed to sheets greater than 72.5 inches wide would be allowable”. Examiner’s Interview Summary mailed 9/17/2014 does not substantiate this comment.

Conclusion

67. The prior art made of record and not relied upon, found in the attached Notice of References Cited (PTO-892), is considered pertinent to applicant's disclosure.

68. 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

12/14/2014

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

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,884,349	03-1999	Gretsinger, Joyce A.	5/502
*	B	US-7,325,263	02-2008	Stribling, Hal D.	5/497
*	C	US-2007/0151028	07-2007	Bauer, Dennis E.	005/482
*	D	US-5,165,128	11-1992	Honig, Ethelyn	5/497
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*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.

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
	First Named Inventor: Susan Walvius	
	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
	1	2005/0284189	12-2005	Stewart, Richard F.			
	2	2007/0283493	12-2007	Link et al.			
	3	2005/0132754	06-2005	Taniguchi et al.			
	4	6,883,193	04-2005	Brooks et al.			
	5	7,176,419	02-2007	Ellis 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

Examiner Signature	Date Considered
/Nicholas Polito/	12/14/2014

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.

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

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
	First Named Inventor: Susan Walvius	
	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
	1	AU2009296195	2/20/2014	Australia				
	2	AU2012202375	2/20/2014	Australia				

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

Examiner Initial	Desig. ID	Document
	3	Chinese Office Action with English translation from corresponding Chinese Application No. 200980147643.6 issued May 17, 2013 (35 pages).
	4	Long, Hairu, "Knitting Technology", English translation included, China Textile & Apparel Press, 1st Edition, pages 12-13, June 2008 (9 pages).
	5	Response to Office Action dated May 27, 2013 in Canadian Application No. 2738658, filed with the Office on June 17, 2013 (20 pages).
	6	Response to Chinese Office Action with English translation from Chinese Application No. 200980147643.6 issued May 17, 2013, filed September 1, 2013 (7 pages).
	7	Chinese Office Action with English translation from Chinese Application 200980147643.6 issued December 6, 2013 (10 pages).
	8	Chinese Office Action with English translation from Chinese Application 200980147643.6 issued July 28, 2014 (37 pages).
	9	Chinese Office Action from Chinese Application 201110443469.9 issued December 20, 2013 (12 pages).
	10	Response with English translation to Chinese Office Action issued December 20, 2013, filed on July 2, 2014 from Chinese application 201110443469.9 (30 pages).

Examiner Signature	Date Considered
/Nicholas Polito/	12/14/2014

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.

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

✓	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	12/14/2014			
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	35	÷	✓	✓	✓	✓	✓			
	36	÷	✓	✓	✓	✓	✓			

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	Art Unit
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☐ 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	12/14/2014			
	37	÷	O	O	✓	✓	✓			
	38	÷	N	N	N	N	-			
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	69					O	O			
	70					✓	✓			
	71					✓	✓			
	72					✓	✓			

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	03/28/2014	12/14/2014			
	73					O	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

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

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
S57	4	(("20090025118") or ("5283909") or ("5970542") or ("5785219")).PN.	US-PGPUB;	OR	OFF	2014/03/28 17:10

			USPAT; USOCR			
S58	9	(flat adj sheet) same spandex	US-PGPUB; USPAT; USOCR	OR	OFF	2014/12/13 15:20
S59	1	(11/325041).APP.	USPAT; USOCR	OR	OFF	2014/12/13 15:30
S60	23	("20040200000" | "20060168726" | "2612646" | "3321782" | "3824640" | "4045831" | "4245365" | "4308626" | "4651371" | "5165128" | "5177821" | "5375274" | "5442822" | "6108836" | "6725477").PN. OR ("7380297").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/12/13 15:31
S61	33	(top adj sheet) same spandex	US-PGPUB; USPAT; USOCR	OR	OFF	2014/12/13 15:31
S62	101	("0924733" | "1327824" | "1732663" | "1865329" | "1959920" | "20040068794" | "20050071923" | "20050193490" | "20070240262" | "2151375" | "2870463" | "2942280" | "3144666" | "3258789" | "3654646" | "3824640" | "4045831" | "4308626" | "4338693" | "4437704" | "4517693" | "4651371" | "4672702" | "4686725" | "4723331" | "4809375" | "4809376" | "4825489" | "4841588" | "4862538" | "4862541" | "4955095" | "4962546" | "4979251" | "4980941" | "5027460" | "5029353" | "5033139" | "5056441" | "5127115" | "5142718" | "5165128" | "5177821" | "5189744" | "5247893" | "5249322" | "5287574" | "5465440" | "5491853" | "5515799" | "5523144" | "5542137" | "5603132" | "5615425" | "5642540" | "5642547" | "5729847" | "5809593" | "5970543" | "5970544" | "5996147" | "6061851" | "6067677" | "6108836" | "6122782" | "6134730" | "6199231" | "6226815" | "6243895" | "6253398" | "6272701" | "6286163" | "6301729" | "6353947" | "6393640" | "6447874" | "6496992" | "6499157" | "6502258" | "6539565" | "6618880" | "6634042" | "6842921" | "6883193" | "6971130" | "6988283").PN. OR ("7325263").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/12/13 15:43
S63	85	("0924733" | "1865329" | "2151375" | "2162755" | "2195039" | "2569627" | "2603793" | "2637094" | "2662234" | "2679056" | "2695414" | "2757389" | "2788532" | "2942280" | "3066323" | "3114156" | "3181179" | "3254348" | "3273175" | "3377636" | "3438068" | "3467174" | "3654646" | "3694832" | "3789441" | "3868735" | "3962739" | "3966633" | "4021869" | "4045831" | "4245365" | "4308626" | "4344196" | "4442558" | "4461048" | "4461049" | "4615061" | "4703530" | "4723331" | "5027460").PN. OR ("5165128").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/12/13 15:46

S64	126	5/482-502.ccls. and (spandex or lycra)	US-PGPUB; USPAT; USOCR	OR	OFF	2014/12/13 15:52
S65	71	(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-$ or US-20120030874-$ or US-20120024013-$ or US-20120102657-$ or US-20090227165-$ or US-20050132754-$ or US-20030054721-$ or US-20040172754-$ or US-20010044963-$ or US-20060282950-$ or US-20070151028-$).did. or (US-6192538-$ 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-$ or US-4567075-$ or US-7992242-$ or US-7319078-$ or US-6508897-$ or US-7117695-$).did. or (US-4944060-$ or US-6883193-$ or US-7176419-$ or US-7191480-$ or US-7240383-$ or US-7325263-$ or US-7398570-$ or US-8171581-$ or US-8402580-$ or US-7428772-$ or US-8566982-$ or US-4771496-$ or US-5299333-$ or US-6108836-$ or US-7380297-$ or US-5189744-$ or US-5165128-$ or US-3144666-$ or US-5884349-$).did. or (US-3187522-$).did.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/12/13 16:08
S66	7	S65 and (spandex or lycra) and king	US-PGPUB; USPAT; USOCR	OR	OFF	2014/12/13 16:09
S67	37	S65 and (spandex or lycra)	US-PGPUB; USPAT; USOCR	OR	OFF	2014/12/13 16:16
S68	5	(("20050284189") or ("20070283493") or ("20050132754") or ("6883193") or ("7176419")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/12/14 15:40
S69	66	5/482-484,486,499-502.ccls. and @pd>"20140301"	US-PGPUB; USPAT; USOCR	OR	OFF	2014/12/14 15:40

EAST Search History (Interference)

< This search history is empty>

12/ 14/ 2014 3:41:43 PM
C:\ Users\ npolito\ Documents\ EAST\ Workspaces\ 13272977.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	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
	Above Search Updated	12/14/2014	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
EAST Search History Attached	12/14/2014	NP

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

	/NICHOLAS POLITO/ Primary Examiner.Art Unit 3673

PTO/SB/30 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Request for Continued Examination (RCE) Transmittal

Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	13/272,977
Filing Date	October 13, 2011
First Named Inventor	Susan Walvius
Art Unit	3673
Examiner Name	Nicholas F. Polito
Attorney Docket Number	29712-0002003

This is a Request for Continued Examination (RCE) under 37 CFR 1 .114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

   a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

      i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

      ii. ☐ Other _____

   b. ☒ Enclosed

      i. ☒ Amendment/Reply

      ii. ☐ Affidavit(s)/ Declaration(s)

      iii. ☒ Information Disclosure Statement (IDS)

      iv. ☐ Other _____

2. Miscellaneous

   Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a

   a. ☐ period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

   b. ☐ Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.
   The Director is hereby authorized to charge the following fees any underpayment of fees or credit any overpayments to

   a. ☒ Deposit Account No. 06-1050 .

      i. ☒ RCE fee required under 37 CFR 1.17(e)

      ii ☒ Extension of time fee (37 CFR 1.136 and 1.17)

      iii ☒ Other any deficiencies

   b. ☐ Check in the amount of $ _____ enclosed

   c. ☐ Payment by credit card (Form PTO-2038 enclosed)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature	/Frank L. Gerratana/	Date	September 25, 2014
Name (Print/Type)	Frank L. Gerratana	Registration No.	62,653

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature			
Name (Print/Type)		Date	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Susan Walvius	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 April 4, 2014, for three months to and including October 4, 2014.

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

Respectfully submitted,

Date: September 25, 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

23294588.doc

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Susan Walvius	Art Unit	:	3673
Serial No.	:	13/272,977	Examiner	:	Nicholas F. Polito
Filed	:	October 13, 2011	Conf. No.	:	4915

Title : FABRIC SYSTEM

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

REPLY TO ACTION DATED APRIL 4, 2014

Amendments to the claims (replacing all prior versions):

1-13. (Cancelled)

14. (Currently Amended) A bed sheet at least 72.5 inches wide comprising

a knit fabric comprising a man-made fiber,

~~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 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; and

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. (Previously Presented) The bed sheet of claim 14 that is sufficiently stretchable to fit 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. (Previously Presented) The bed sheet of claim 14 that is sufficiently stretchable to fit a crib 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. (Previously Presented) The bed sheet of claim 14 comprising an element that can be cinched to increase tension around an edge of the bed sheet.

28. (Previously Presented) The bed sheet of claim 17, wherein at least one of the fabric characteristics comprises UV protection.

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

30. (Previously Presented) The bed sheet of claim 17, wherein at least one of the fabric characteristics comprises thermo-regulation.

31. (Previously Presented) The bed sheet of claim 17, wherein at least one of the fabric characteristics comprises wind resistance.

32. (Previously Presented) The bed sheet of claim 17, wherein at least one of the fabric characteristics comprises water resistance.

33. (Currently Amended) A bed sheet at least 72.5 inches wide 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. (Previously Presented) 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 - 40. (Canceled)

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.

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

43. (Previously Presented) 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. (Previously Presented) The bed sheet of claim 41 that is at least 90 inches wide.

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

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

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

48. (Previously Presented) 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. (Previously Presented) The bed sheet of claim 14 in which the fabric comprises polyurethanepolyurea copolymer fiber.

50. (Previously Presented) 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.

51-52. (Canceled)

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

54. (Previously Presented) 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. (Previously Presented) The bed sheet of claim 33 having dimensions of approximately 102 inches in length and approximately 91 inches in width.

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

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

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

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

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

61. (Currently Amended) A bed sheet <u>at least 72.5 inches wide</u> 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. (Currently Amended) 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. (Previously Presented) The bed sheet of claim 61 in which the first fabric area has a width of a twin size bed.

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

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

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

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

68. (Canceled)

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

70. (Previously Presented) 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. (Previously Presented) The bed sheet of claim 61, comprising piping.

72. (Previously Presented) 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. (Previously Presented) The bed sheet of claim 61 having dimensions of approximately 102 inches in length and approximately 91 inches in width.

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

75. (Previously Presented) 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.

REMARKS

Claims 61, 62, and 67 were objected to and have been amended.

Claims 41-48 and 51 stand rejected under 35 U.S.C. 112. Claims 14, 16, 19, 21-24, 49, 50, 52, 61-68, 70-72 and 75 stand rejected under 35 U.S.C. 102. Claims 20, 27, 33, 35-37, 53, 54, 56-60, and 74 stand rejected under 35 U.S.C. 103.

The applicant's representative Frank Gerratana (Reg. No. 62,653) thanks the examiner for attending a telephone interview on September 11, 2014. In accordance with 37 CFR § 1.133 and MPEP § 713.04, a written statement of the substance of the interview is included herein. The interview included a discussion of claim 14 in view of the cited references and a discussion of claim 41 in view of the section 112 rejection. The examiner indicated that claims directed to sheets greater than 72.5 inches wide would be allowable. In response, independent claims 14, 33, 41, and 61 have been amended to overcome the rejections. Accordingly, all of the pending claims are believed to be in condition for allowance, including the ones identified as allowable by the examiner in the outstanding office action.

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 any other charges or credits to deposit account 06-1050, referencing attorney docket 29712-0002003.

Respectfully submitted,

Date: September 25, 2014_____

/Frank L. Gerratana/_____
Frank L. Gerratana
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23276534.doc

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Susan Walvius	Art Unit	:	3673
Serial No.	:	13/272,977	Examiner	:	Nicholas F. Polito
Filed	:	October 13, 2011	Conf. No.	:	4915
Title	:	FABRIC SYSTEM			

MAIL STOP RCE
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. Foreign patent documents and non-patent literature are enclosed; cited U.S. patents and patent application publications will be provided on request.

This filing is being made with the filing of a Request for Continued Examination. No fee is required.

Respectfully submitted,

Date: September 25, 2014

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

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23276573.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) (37 CFR §1.98(b))		First Named Inventor Susan Walvius	
		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
	1	AU2009296195	2/20/2014	Australia				
	2	AU2012202375	2/20/2014	Australia				

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

Examiner Initial	Desig. ID	Document
	3	Chinese Office Action with English translation from corresponding Chinese Application No. 200980147643.6 issued May 17, 2013 (35 pages).
	4	Long, Hairu, "Knitting Technology", English translation included, China Textile & Apparel Press, 1st Edition, pages 12-13, June 2008 (9 pages).
	5	Response to Office Action dated May 27, 2013 in Canadian Application No. 2738658, filed with the Office on June 17, 2013 (20 pages).
	6	Response to Chinese Office Action with English translation from Chinese Application No. 200980147643.6 issued May 17, 2013, filed September 1, 2013 (7 pages).
	7	Chinese Office Action with English translation from Chinese Application 200980147643.6 issued December 6, 2013 (10 pages).
	8	Chinese Office Action with English translation from Chinese Application 200980147643.6 issued July 28, 2014 (37 pages).
	9	Chinese Office Action from Chinese Application 201110443469.9 issued December 20, 2013 (12 pages).
	10	Response with English translation to Chinese Office Action issued December 20, 2013, filed on July 2, 2014 from Chinese application 201110443469.9 (30 pages).

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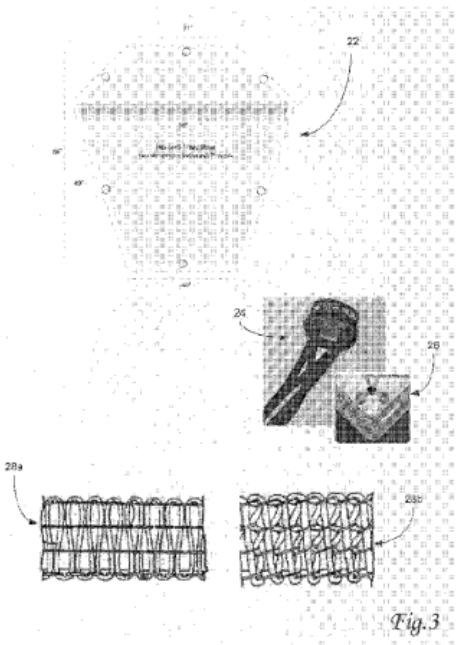

Fig.3

(57) **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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FABRIC SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

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

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.

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.

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.

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."

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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

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.

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.

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.

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

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.

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.

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.

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.

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

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.

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.

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.

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.

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.

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.

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

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

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.

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.

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.

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.

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.

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.

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.

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 multidirectional stretch.

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.

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.

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.

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**.

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**.

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.

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 performance fabrics.

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.

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.

"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.

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.

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.

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.

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.

Reference to any prior art throughout this specification is not, and should not be taken as, an acknowledgement or any form of suggestion that such prior art forms part of the common general knowledge in Australia.

2009296195 21 Oct 2013

CLAIMS:

1. A method of making a finished fabric at least 90 inches wide comprising:
forming at least two discrete performance fabric portions; and
joining at least two discrete performance fabric portions to form the finished fabric, wherein at least one of the performance fabric portions has been circularly knit at 17 gauges or higher.

2. The method of claim 1, wherein forming at least two discrete performance fabric portions comprises knitting at least two discrete performance fabric portions.

3. The method of claim 1, wherein forming at least two discrete performance fabric portions comprises circular knitting at least one of the discrete performance fabric portions.

4. The method of claim 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. The method of claim 1, wherein the two discrete performance fabric portions are joined by flatlock stitching.

6. The method of claim 1, comprising
heat setting finishing the joined at least two discrete fabric portions.

7. The method of claim 1 wherein the finished fabric comprises a bed sheet.

8. The method of claim 7, further comprising providing piping to the bed sheet.

9. The method according to claim 1, wherein the at least two discrete fabric portions have different fabric characteristics.

10. A method of making a finished fabric at least 90 inches wide comprising

circular knitting at least two discrete fabric portions;

stitching at least two discrete fabric portions; and

heat setting finishing the stitched at least two discrete fabric portions, wherein at least one of the discrete fabric portions includes a performance fabric portion that has been circularly knit at 17 gauges or higher.

11. A method of making a bed sheet at least 90 inches wide from performance fabric comprising:

circular knitting at least two discrete fabric portions; the two discrete fabric portions having different fabric characteristics including at least one of the following: moisture management, UV protection, anti-microbial, thermo-regulation, wind resistance, and water resistance;

stitching at least two discrete fabric portions together;

heat setting finishing the stitched at least two discrete fabric portions to form a finished bed sheet; and

providing piping to the finished bed sheet,

wherein at least one of the discrete fabric portions includes a performance fabric portion that has been circularly knit at 17 gauges or higher.

12. 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 circular knitted fabric portions comprising a circular knitted performance fabric portion that has been circularly knit at 17 gauges or higher;

wherein the first and second fabric portions are discrete; and

wherein the first and second fabric portions are joined to form the finished fabric.

13. The finished fabric of claim 12, further comprising piping.

14. The finished fabric of claim 12, wherein the first and second fabrics have different fabric characteristics.

15. The finished fabric of claim 14, wherein at least one of the fabric characteristics comprises moisture management.

16. The finished fabric of claim 14, wherein at least one of the fabric characteristics comprises UV protection.

17. The finished fabric of claim 14, wherein at least one of the fabric characteristics comprises anti-microbial properties.

18. The finished fabric of claim 14, wherein at least one of the fabric characteristics comprises thermo-regulation.

19. The finished fabric of claim 14, wherein at least one of the fabric characteristics comprises wind resistance.

20. The finished fabric of claim 14, wherein at least one of the fabric characteristics comprises water resistance.

21. The finished fabric of claim 12, wherein the performance fabric portion comprises a man-made fiber that has higher breathability than a cotton fabric.

22. The finished fabric of claim 12, wherein the performance fabric portion comprises a man-made fiber that has higher heat transfer than a cotton fabric.

23. The finished fabric of claim 12, wherein the performance fabric portion comprises a man-made fiber that has higher moisture wicking characteristics than a cotton fabric.

24. The finished fabric of claim 12, having a gauge of at least 17 gauges.

25. The finished fabric of claim 12, comprising a bed sheet.

26. The finished fabric of claim 25, comprising a bed covered by the bed sheet.

27. The finished fabric of claim 25, wherein the bed sheet is sufficiently stretchable to fit a standard rectangular bed and a smaller, non-rectangular marine bed.

28. The finished fabric of claim 25, wherein the bed sheet is sufficiently stretchable to fit either a crib or a standard adult bed.

29. The finished fabric of claim 12, comprising a knit fabric that includes polyurethanepolyurea copolymer fiber.

30. The finished fabric of claim 29, wherein the polyurethanepolyurea copolymer fiber is included in the knit fabric in a proportion that, if circularly knit at a high gauge, the knit fabric could be knit at no more than a 72.5 inch circumference without losing integrity of the polyurethanepolyurea copolymer fiber.

31. The method of claim 1, wherein the performance fabric has an elasticity such that the performance 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 performance fabric were circularly knit at greater than a 72.5 inch circumference.

32. The method of claim 1, wherein the performance fabric comprises a synthetic material in a proportion such that the fabric could be circularly knit at no more than a 72.5 inch circumference without losing integrity of the fabric.

33. The finished fabric of claim 12, wherein the circular knitted performance fabric portion comprises a performance fabric that has an elasticity such that the performance 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 performance fabric were circularly knit at greater than a 72.5 inch circumference.

34. The finished fabric of claim 12, wherein the circular knitted performance fabric portion comprises a synthetic material in a proportion such that the fabric could be

circularly knit at no more than a 72.5 inch circumference without losing integrity of the fabric.

35. A method of making a finished fabric substantially as herein described.

36. A method of making a finished fabric at least 90 inches substantially as herein described.

37. A method of making a bed sheet at least 90 inches wide from performance fabric substantially as herein described.

38. A finished fabric at least 90 inches wide substantially as herein described.

39. A finished fabric comprising:

a first circular knitted fabric portion; and a second circular knitted fabric portion, at least one of the circular knitted fabric portions comprising a circular knitted performance fabric portion, and at least one of the circular knitted fabric portions comprising polyurethanepolyurea copolymer fiber;

wherein the first and second fabric portions are discrete; and

wherein the first and second fabric portions are joined to form the finished fabric.

40. The finished fabric of claim 39, wherein the polyurethanepolyurea copolymer fiber is included in the circular knitted fabric portion in a proportion that, if circularly knit at a high gauge, the circular knitted fabric portion could be knit at no more than a 72.5 inch circumference without losing integrity of the polyurethanepolyurea copolymer fiber.

41. A method of making a finished fabric comprising:

forming at least two discrete performance fabric portions; and

joining at least two discrete performance fabric portions to form the finished fabric,

wherein the performance fabric has an elasticity such that the performance 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 performance fabric were circularly knit at greater than a 72.5 inch circumference.

42. A method of making a finished fabric comprising:

forming at least two discrete performance fabric portions; and

joining at least two discrete performance fabric portions to form the finished fabric,

wherein the performance fabric comprises a synthetic material in a proportion such that the fabric could be circularly knit at no more than a 72.5 inch circumference without losing integrity of the fabric.

43. A finished fabric comprising:

a first circular knitted fabric portion; and a second circular knitted fabric portion, at least one of the circular knitted fabric portions comprising a circular knitted performance fabric portion;

wherein the circular knitted performance fabric portion comprises a performance fabric that has an elasticity such that the performance 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 performance fabric were circularly knit at greater than a 72.5 inch circumference;

wherein the first and second fabric portions are discrete; and

wherein the first and second fabric portions are joined to form the finished fabric.

44. The finished fabric of claim 43, wherein the finished fabric comprises a bed sheet.

45. The finished fabric of claim 43, wherein the performance fabric portion has at least one of higher breathability, higher heat transfer, or higher moisture wicking characteristics than a cotton fabric.

46. A finished fabric comprising:

a first circular knitted fabric portion; and a second circular knitted fabric portion, at least one of the circular knitted fabric portions comprising a circular knitted performance fabric portion;

wherein the circular knitted performance fabric portion comprises a synthetic material in a proportion such that the fabric could be circularly knit at no more than a 72.5 inch circumference without losing integrity of the fabric;

wherein the first and second fabric portions are discrete; and

wherein the first and second fabric portions are joined to form the finished fabric.

47. The finished fabric of claim 46, wherein the finished fabric comprises a bed sheet.

48. The finished fabric of claim 46, wherein the performance fabric portion has at least one of higher breathability, higher heat transfer, or higher moisture wicking characteristics than a cotton fabric.

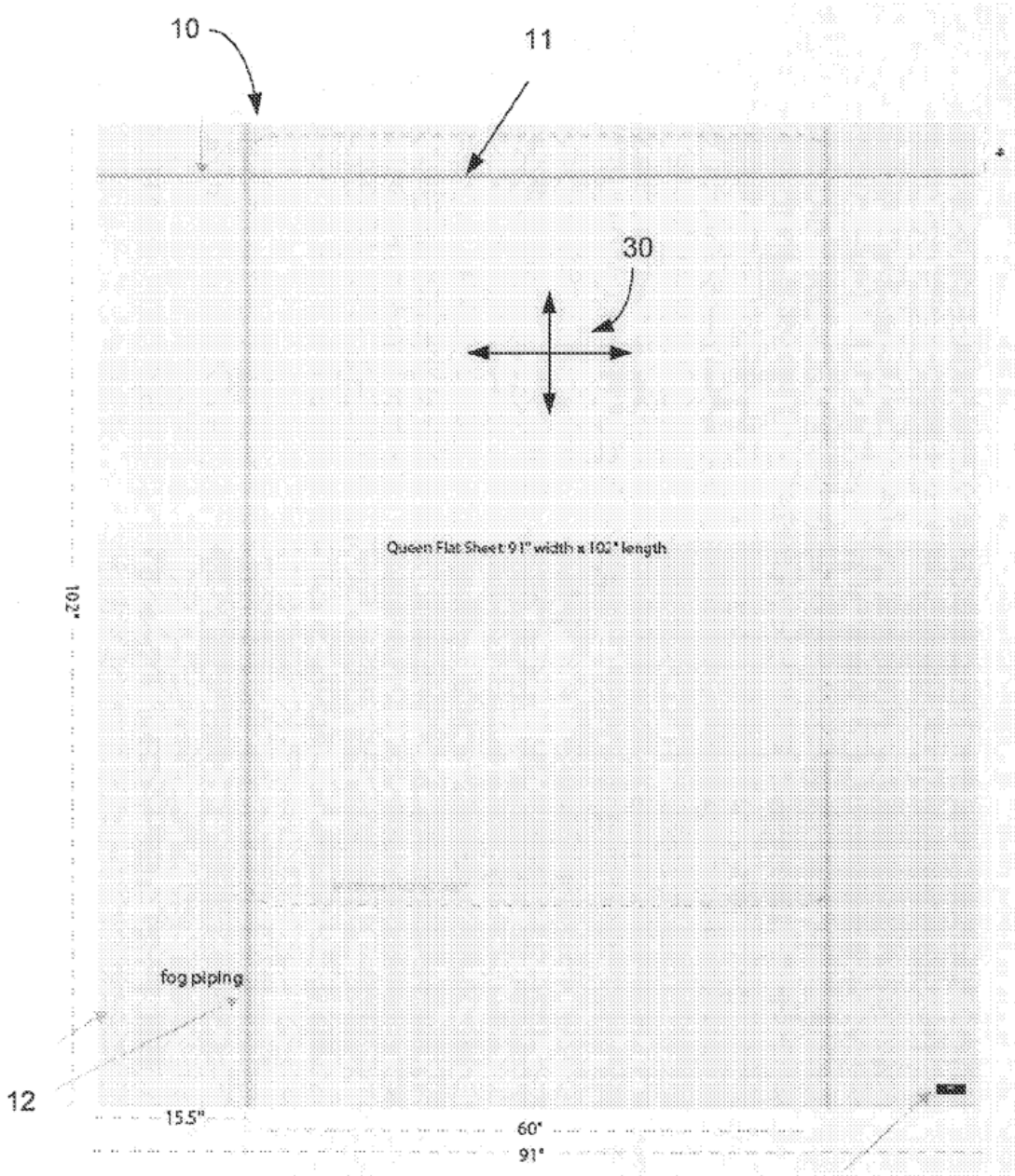
10
11
30
Queen Flat Sheet: 91" width x 102" length
102"
fog piping
12
15.5"
60"
91"

Fig. 1

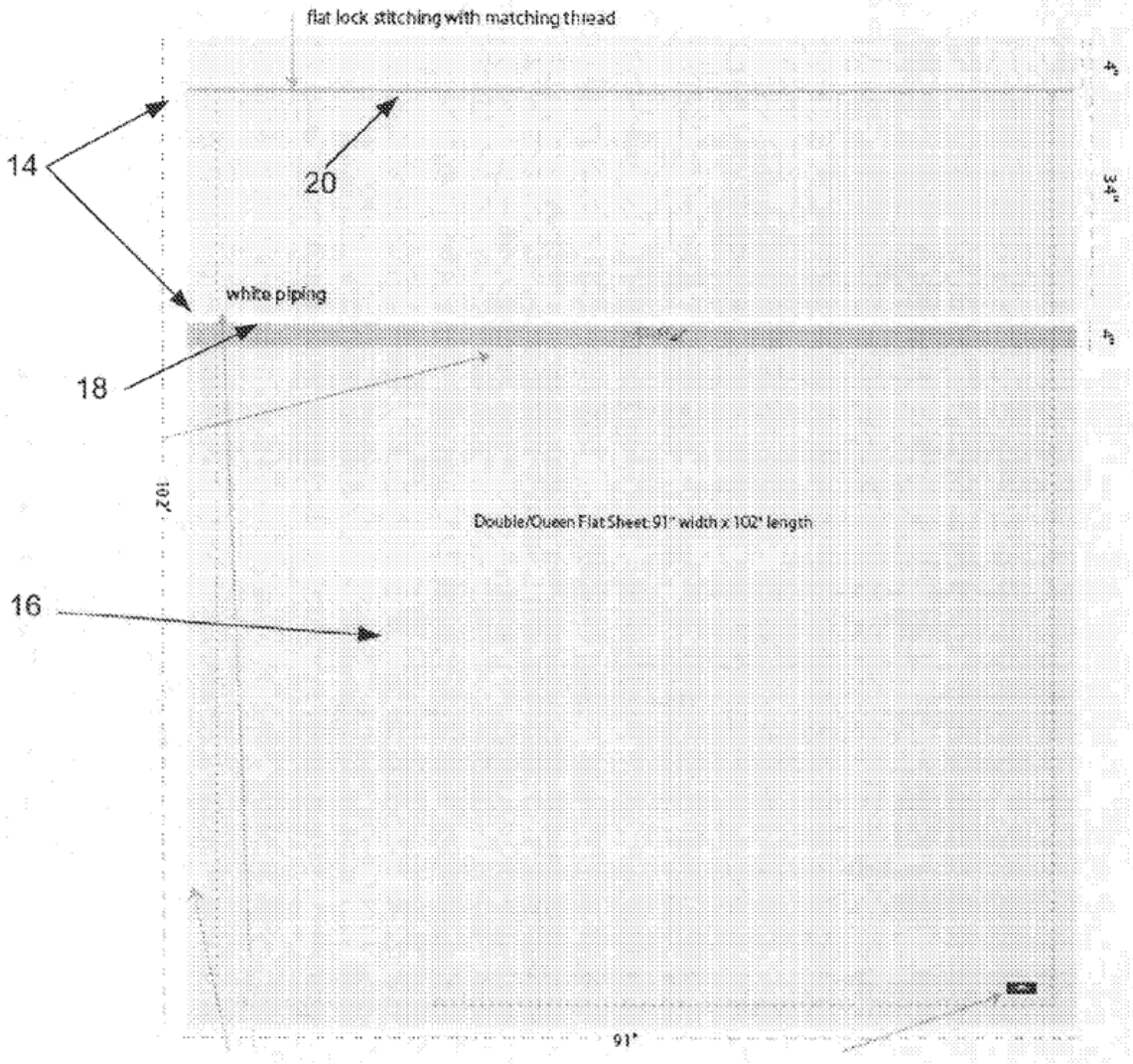
flat lock stitching with matching thread
14
20
white piping
18
16
Double/Queen Flat Sheet: 91" width x 102" length
102"
91"
4"
34"
4"

Fig.2

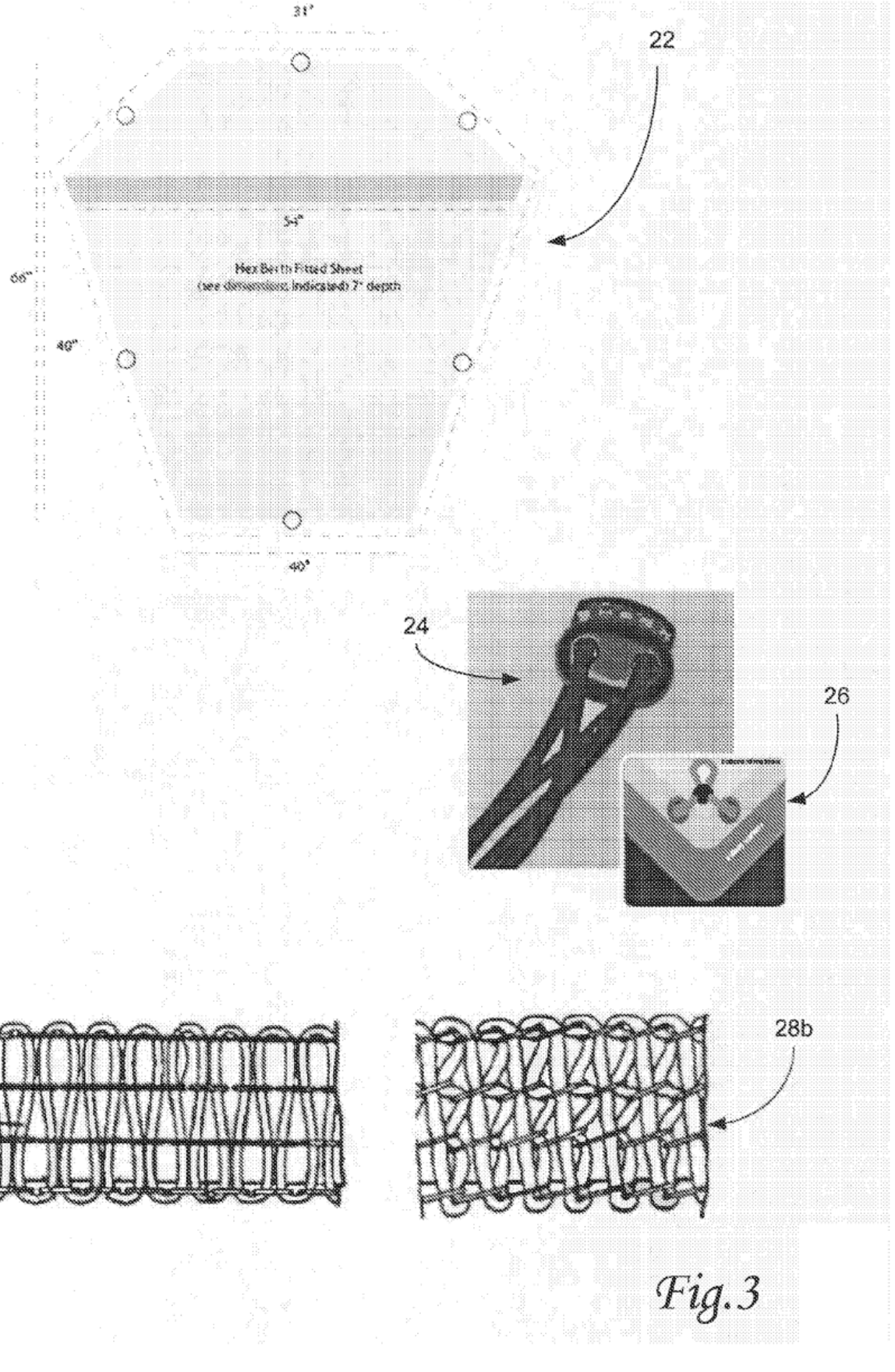
31"
22
54"
Hex Berth Fitted Sheet
(see dimensions indicated) 7" depth
66"
40"
40"
24
26
28a
28b

Fig.3

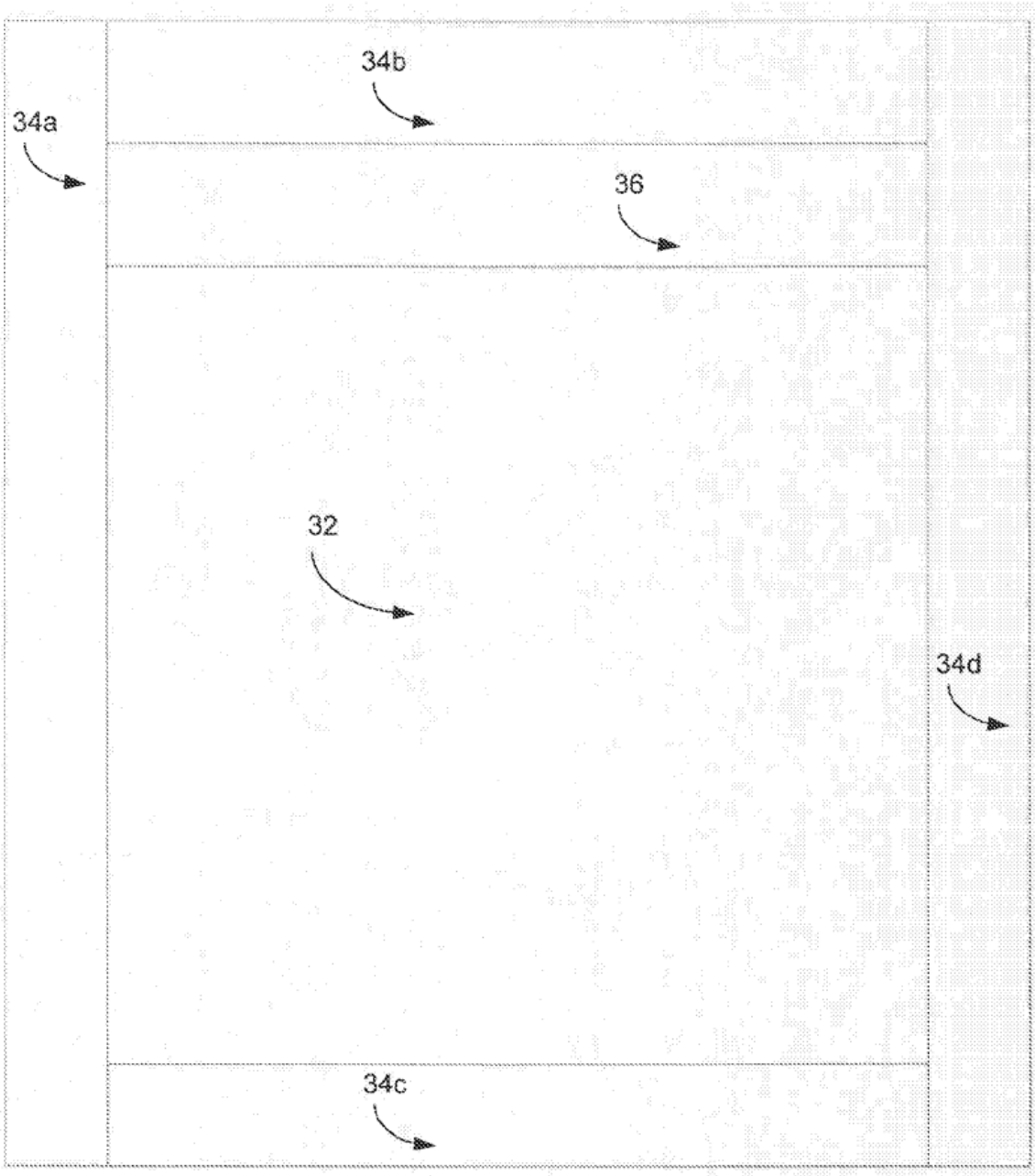

Fig.4

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(19) AUSTRALIAN PATENT OFFICE

(54) Title
Fabric system

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(56) Related Art
US 6,381,779 B1
JP 11-309183 A
US 6,823,548 B2

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.

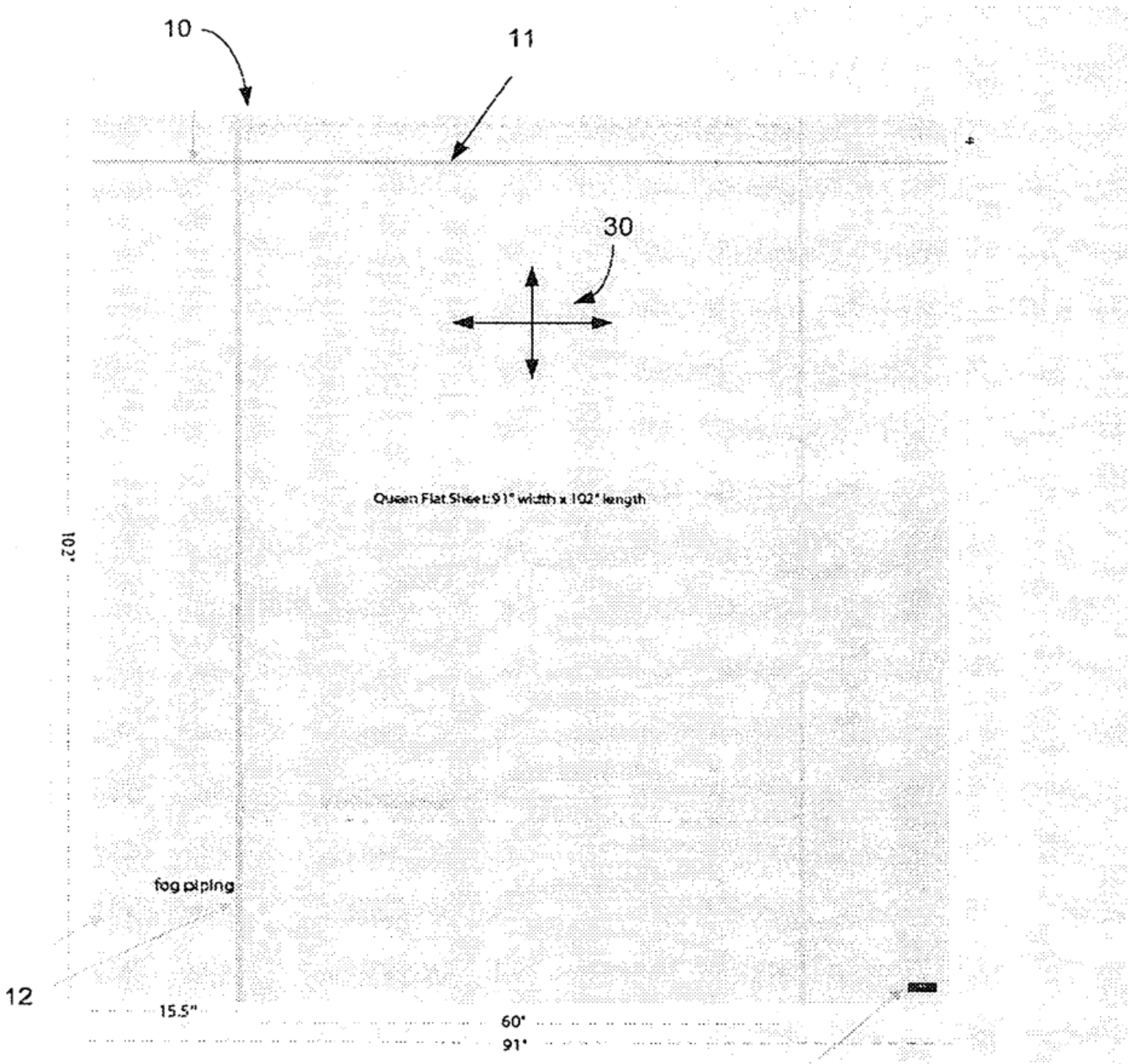


Fig. 1

2012202375 24 Apr 2012

AUSTRALIA
Patents Act 1990

Regulation 3.2

Complete Specification

Standard Patent

DIVISIONAL

APPLICANT: **Sheex, Inc.**

Invention Title: **FABRIC SYSTEM**

The following statement is a full description of this invention, including the best method of performing it known to me:

FABRIC SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

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

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.

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.

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.

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."

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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

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.

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.

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.

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

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.

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.

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.

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.

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

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.

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.

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.

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.

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.

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.

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

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

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.

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.

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.

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.

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.

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.

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.

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 multidirectional stretch.

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.

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.

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.

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**.

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**.

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.

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 performance fabrics.

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.

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.

"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.

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.

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.

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.

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.

Reference to any prior art throughout this specification is not, and should not be taken as, an acknowledgement or any form of suggestion that such prior art forms part of the common general knowledge in Australia.

2012202375 19 Oct 2013

CLAIMS:

1. A bed sheet comprising a fabric of a man-made fiber, the fabric having been knit at 17 gauges or higher, the fabric having higher breathability, higher heat transfer, and higher moisture wicking characteristics than a cotton fabric,

wherein the man-made fiber comprises a performance fabric that has an elasticity such that the performance 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 performance fabric were circularly knit at greater than a 72.5 inch circumference.

2. The bed sheet of claim 1 wherein the fabric comprises a finished fabric comprising:

a first circular knitted fabric portion; and

a second circular knitted fabric portion;

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.

3. The bed sheet of claim 1, comprising piping.

4. The bed sheet of claim 2, wherein the first and second fabric portions have different fabric characteristics.

5. The bed sheet of claim 4, wherein at least one of the fabric characteristics comprises moisture management.

6. The bed sheet of claim 1 in which the fabric is knit of the man-made fiber.

7. The bed sheet of claim 1 in which the fabric is circularly knit.

8. The bed sheet of claim 1 being stretchable to fit either a baby crib and an adult bed.

9. The bed sheet of claim 1 that is sufficiently stretchable to fit a standard rectangular bed and a smaller, non-rectangular marine bed.

10. The bed sheet of claim 1 that is sufficiently stretchable to fit either a crib or a standard adult bed.

11. The bed sheet of claim 1 that is at least 90 inches wide.

12. The bed sheet of claim 1 having dimensions of approximately 102 inches in length and approximately 91 inches in width.

13. The bed sheet of claim 1 comprising a pull tie that can be cinched to increase tension around an edge of the bed sheet.

14. The bed sheet of claim 4, wherein at least one of the fabric characteristics is UV protection.

15. The bed sheet of claim 4, wherein at least one of the fabric characteristics is anti-microbial fabric.

16. The bed sheet of claim 4, wherein at least one of the fabric characteristics is thermo-regulation.

17. The bed sheet of claim 4, wherein at least one of the fabric characteristics is wind resistance.

18. The bed sheet of claim 4, wherein at least one of the fabric characteristics is water resistance.

19. A bed sheet comprising a fabric circularly knit of a man-made fiber, the fabric having a gauge of at least 17 gauges, and the fabric having higher breathability, higher heat transfer, and higher moisture wicking characteristics than a cotton fabric, wherein the man-made fiber comprises a synthetic material in a proportion such that the fabric could be circularly knit at no more than a 72.5 inch circumference without losing integrity of the fabric.

20. A bed sheet comprising a fabric of a man-made fiber substantially as herein described.

21. The bed sheet of claim 19, wherein the man-made fiber comprises a performance fabric that has an elasticity such that the performance 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 performance fabric were circularly knit at greater than a 72.5 inch circumference.

22. The bed sheet of claim 19 that is at least 90 inches wide.

23. The bed sheet of claim 19 wherein the fabric comprises a finished fabric comprising:

a first circular knitted fabric portion; and

a second circular knitted fabric portion;

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.

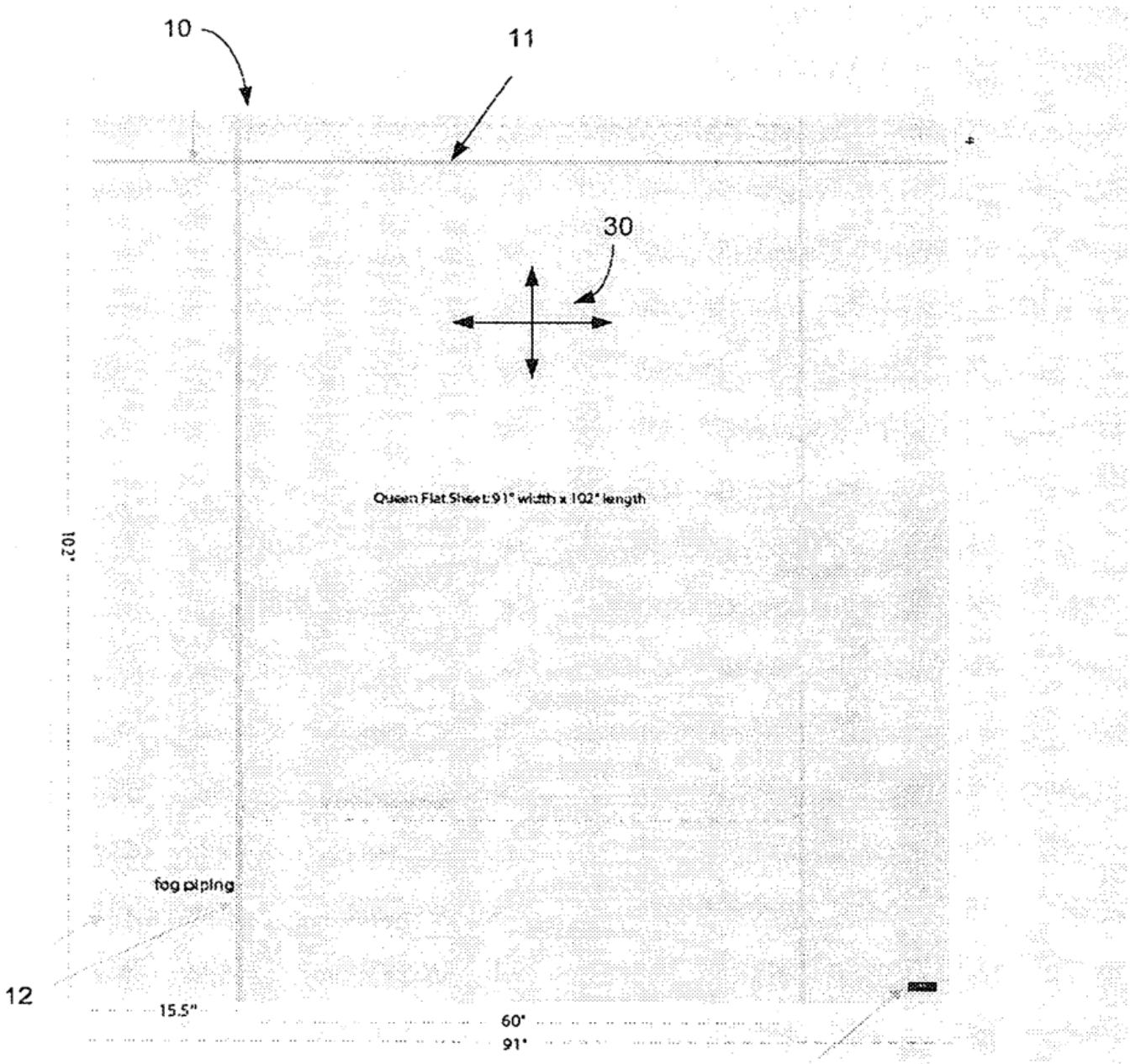


Fig. 1

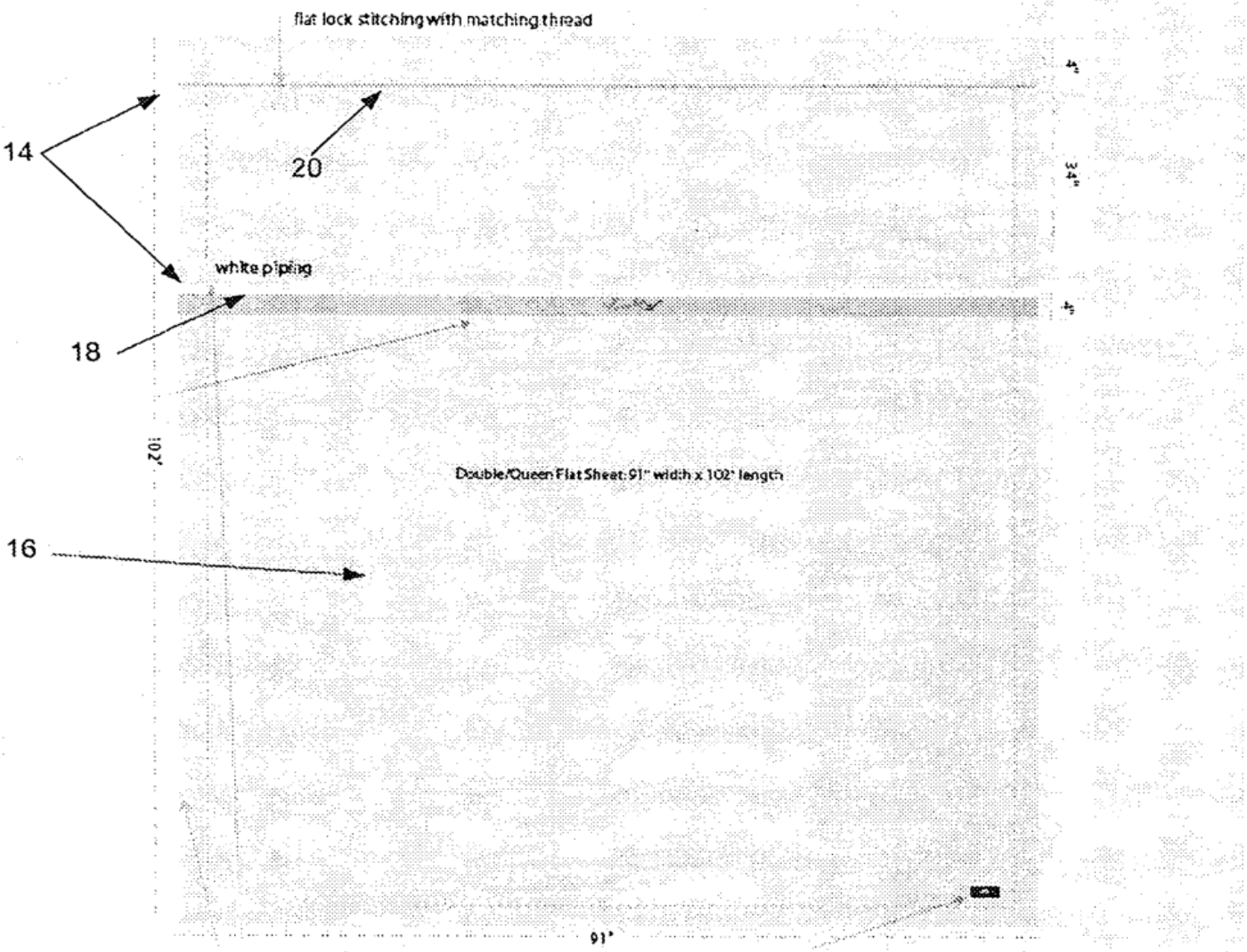
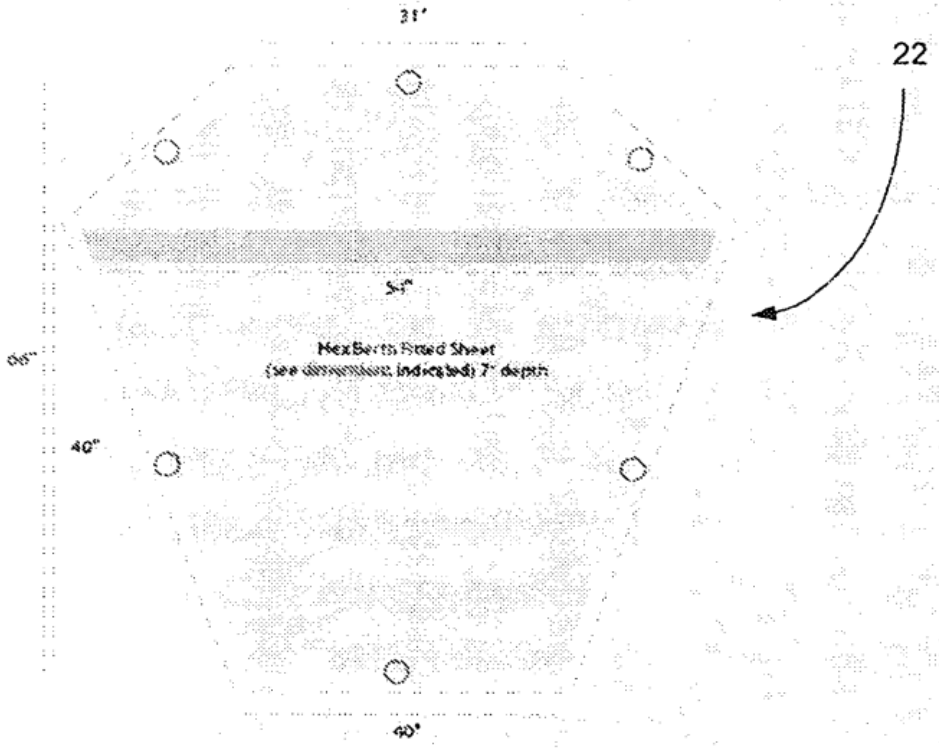
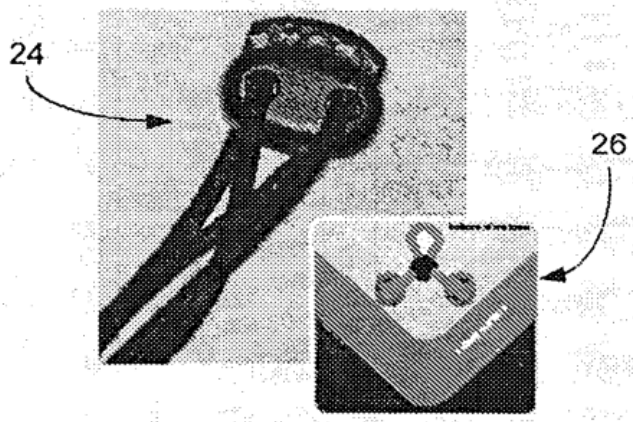


Fig.2





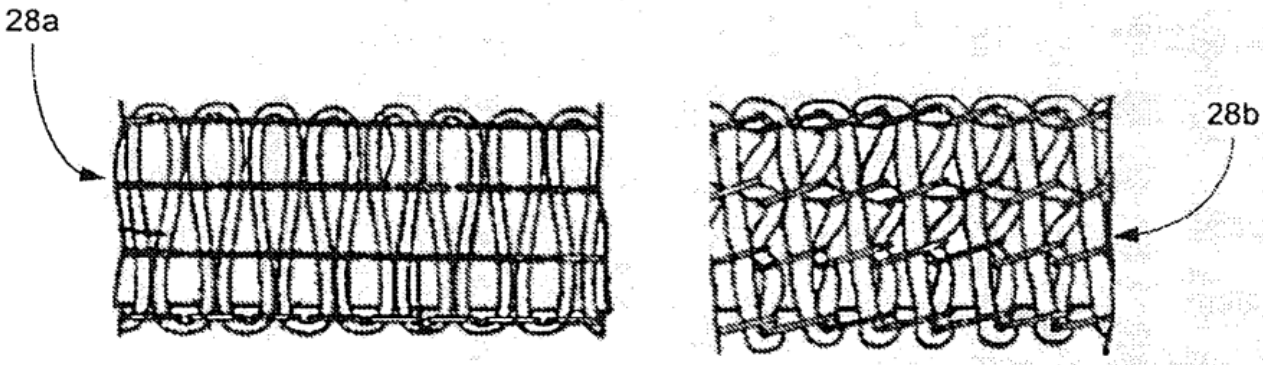


Fig.3

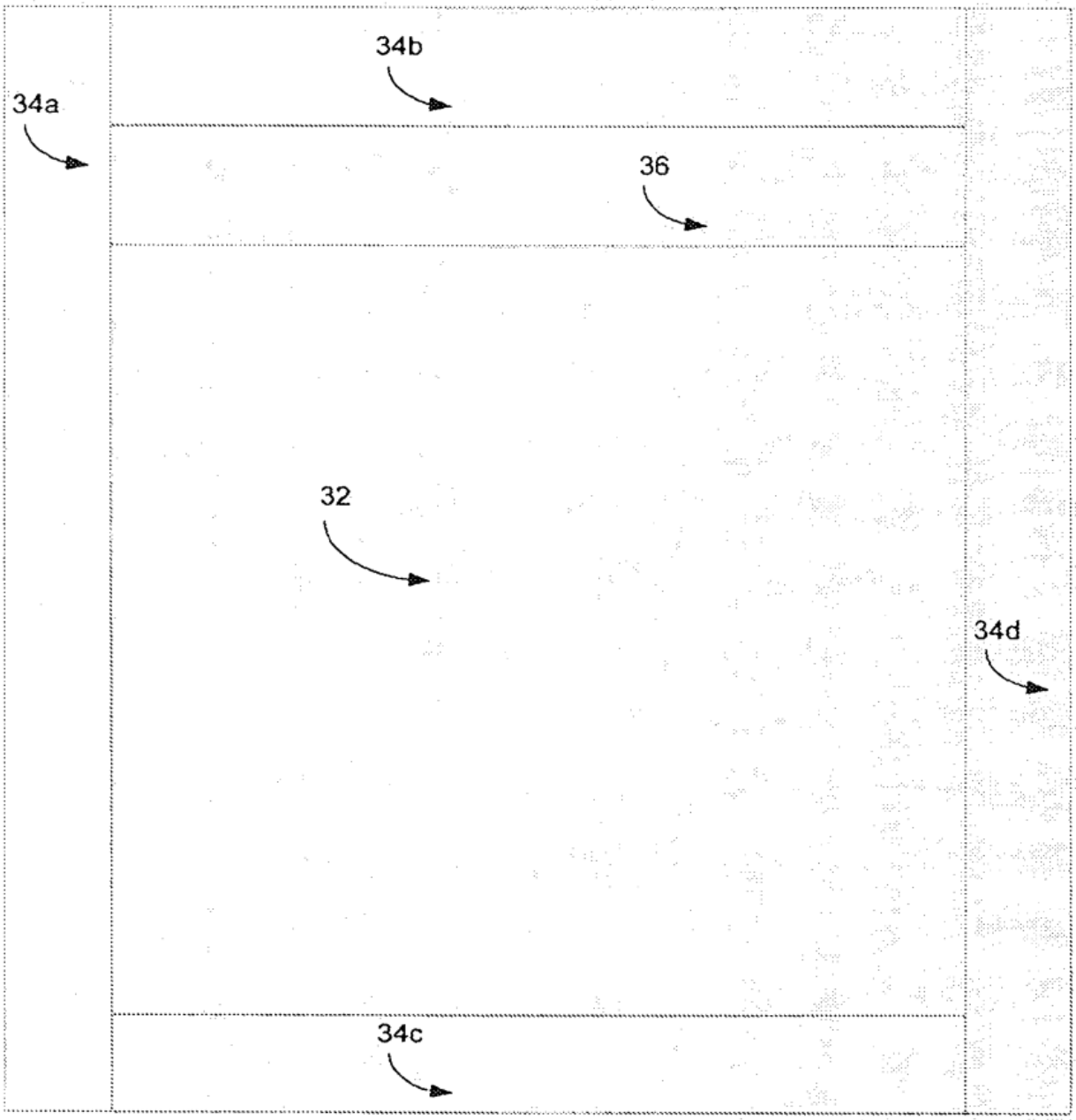


Fig.4

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($)
Miscellaneous:				
RCE - 2nd and Subsequent Request	1820	1	1700	1700
		Total in USD ($)		**3100**

Electronic Acknowledgement Receipt

EFS ID:	20246134
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:	25-SEP-2014
Filing Date:	13-OCT-2011
Time Stamp:	15:49:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$3100
RAM confirmation Number	2264
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	Request for Continued Examination (RCE)	RCE.pdf	144330 903fd2a0b759c86ea6ef5d14b7019d1c71e37eeb	no	1
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	Extension of Time	ext.pdf	46650 351a346370da1641fafd5d47252dfe8a343a9ede	no	1
Warnings:					
Information:					
3		response.pdf	79362 3332913244a8b5fd3f0be1d4f4c213af321aa0ea	yes	11

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment Submitted/Entered with Filing of CPA/RCE	1	1
	Claims	2	9
	Applicant Arguments/Remarks Made in an Amendment	10	11

Warnings:					
Information:					
4	Transmittal Letter	IDS.pdf	61653 2d0172718fb7d1a8da68c14253e08418442fde59	no	1
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	1449.pdf	92873 914fff14124f6e5900ad6f2b2ae1187380685ead	no	1
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
6	Foreign Reference	AU2009296195.pdf	1805391 040e654e2a585c8f3d026566b3a58fea22229e6d	no	26
Warnings:					
Information:					
7	Foreign Reference	AU2012202375.pdf	1179158 fd63916ae57cfb399fc1fe286bd0716e0639a1da	no	23

Warnings:					
Information:					
8	Non Patent Literature	2CN1_OA2_5_17_13.pdf	4245926 796f0e2231a8d3ec521db0d25c1ec51bce31dc4f	no	35
Warnings:					
Information:					
9	Non Patent Literature	Long.pdf	2689369 9c48b8cff886a0e97f7f9e0cb71db430c8989f5b	no	9
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Information:					
10	Non Patent Literature	2CA1_ROA_6_17_13.pdf	1598972 956a7691668ae8b054618d88a1170c151ab33970	no	20
Warnings:					
Information:					
11	Non Patent Literature	2CN1_OA3_12-6-13.pdf	862481 1b6378ecda6710500b326a05ad290fab3dee00d5	no	10
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Information:					
12	Non Patent Literature	2CN1-4-OA-7-28-14.pdf	2242554 70d6a7d602262ad5053d482ad7651aecf75880ff	no	37
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Information:					
13	Non Patent Literature	2CN2-OA1-12-20-13.pdf	1076660 e8635c8e4b2685e8ba5497e4ca3ffd3ac91278ea	no	12
Warnings:					
Information:					
14	Non Patent Literature	2CN2-ROA1-7-2-14.pdf	308205 2991f5a2b0199e13cf2ce9dd85d0bba031a6a0b4	no	30
Warnings:					
Information:					
15	Non Patent Literature	2CN1-Resp-OA-9-1-13.pdf	648155 47cf4b35e016cfe04bca553f26ac4f6a8d881f94	no	7
Warnings:					
Information:					
16	Fee Worksheet (SB06)	fee-info.pdf	31792 374131dd4015e78828c24c0361d0916aef1bfa49	no	2

Warnings:	
Information:	
Total Files Size (in bytes):	17113531

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.

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)		First Named Inventor Susan Walvius	
(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
	1	2005/0284189	12-2005	Stewart, Richard F.			
	2	2007/0283493	12-2007	Link et al.			
	3	2005/0132754	06-2005	Taniguchi et al.			
	4	6,883,193	04-2005	Brooks et al.			
	5	7,176,419	02-2007	Ellis 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

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 Acknowledgement Receipt

EFS ID:	20246538
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:	25-SEP-2014
Filing Date:	13-OCT-2011
Time Stamp:	16:05:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IDS-1449.pdf	116945 1791e9aa64ded19e49d13029105bca43cd23e73b	yes	2

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	1
	Information Disclosure Statement (IDS) Form (SB08)	2	2
Warnings:			
Information:			
	Total Files Size (in bytes):	116945	

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
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Susan Walvius	Art Unit	:	3673
Serial No.	:	13/272,977	Examiner	:	Nicholas F. Polito
Filed	:	October 13, 2011	Conf. No.	:	4915
Title	:	FABRIC SYSTEM			

MAIL STOP RCE
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. Foreign patent documents and non-patent literature are enclosed; cited U.S. patents and patent application publications will be provided on request.

This filing is being made with the filing of a Request for Continued Examination. No fee is required.

Respectfully submitted,

Date: September 25, 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

23276573.doc

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 Substitute for Form PTO-875	Application or Docket Number 13/272,977	Filing Date 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 **09/25/2014**

	(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))	* 56	Minus	** 61	= 0	X $80 =	0
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	0

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
/VENICE WILLIAMS/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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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 09/17/2014
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
09/17/2014	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

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: *11 September 2014*.

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 and 41*.

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 4/4/2014. Applicant argued that the features which examiner stated were inherent to spandex, were not inherent to spandex and that a specialized composite of fabric is used to meet the claimed features. Examiner found the arguments not persuasive as there is currently not enough information in the claims. Applicant will consult materials expert for further analysis. Applicant suggested amending claim 41 to overcome the 112 rejection by stating the bed sheet has a width of greater than 72.5 inches. Examiner agreed the proposed amendment would overcome the 112 rejection. The proposal, used for discussion purposes only, is attached.

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/ Primary 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.

FISH.
FISH & RICHARDSON

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Interview Agenda
For Discussion Purposes Only
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Date September 10, 2014

To Nicholas F. Polito
United States Patent Office
Box Duplicate TC3700
US patent and Trademark Office,
P.O. Box 2327
Arlington, VA 22202-2327
Telephone: 571-270-5923

Facsimile 571-270-6923

From Jennifer Pak Franco
Patent Paralegal/Case Manager

Re High performance bedding - CON
Your Ref.: USSN 13/272,977
Our Ref.: 29712-0002003

Pages including cover 3

Message
Dear Examiner,

Can you please confirm receipt of this fax by email to jfranco@fr.com?

Thank you.