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Paper 35
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BLUE BELT TECHNOLOGIES, INC.,
Petitioner,

v.

ALL-OF-INNOVATION GMBH,
Patent Owner.

Case IPR2015-00765
Patent 7,346,417 B2

Before SALLY C. MEDLEY, KEVIN F. TURNER, and WILLIAM M. FINK, *Administrative Patent Judges.*

FINK, *Administrative Patent Judge.*

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

On February 19, 2015, Blue Belt Technologies ("Petitioner") filed a Petition requesting an *inter partes* review of claims 1, 3, 5–7, 9, 10, 16, 17, 21, 26, 40, 45, 56, and 57 of U.S. Patent No. 7,346,417 B2 (Ex. 1001, "the '417 patent"). Paper 1 ("Pet."). On June 5, 2015, All-Of-Innovation GmbH

("Patent Owner") filed a Preliminary Response. Paper 9 ("Prelim. Resp."). On August 3, 2015, we granted the Petition and instituted trial as to claims 1, 3, 5–7, 9, 10, 16, 17, 21, 26, 40, 45, 56, and 57 of the '417 patent on one of the grounds of unpatentability, under 35 U.S.C. § 103, that was alleged in the Petition. Paper 10 ("Inst. Dec.").

After institution Patent Owner filed a Patent Owner Response ("PO Resp."). Paper 14. Petitioner filed a Reply to the Patent Owner Response. Paper 21 ("Pet. Reply"). Patent Owner also filed a Motion to Amend. Paper 15 ("Mot."). Petitioner filed an Opposition to Patent Owner's Motion to Amend. Paper 22 ("Opp. Mot."). Patent Owner filed a Reply to Petitioner's Opposition. Paper 25 ("Reply Mot."). Patent Owner also filed a Motion for Observation on Cross-Examination. Paper 27 ("Mot. Obsv."). Petitioner filed a Response to Petitioner's Motion for Observation. Paper 31 ("Resp. Obsv.") An oral hearing for IPR2015-00765 was held on April 7, 2016. The transcript of the hearing has been entered into the record. Paper 34 ("Tr.").

We have jurisdiction under 35 U.S.C. § 6(c). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). Petitioner has shown that claims 1, 3, 5–7, 9, 10, 16, 17, 21, 26, 40, 45, 56, and 57 of the '417 patent are unpatentable. Patent Owner's Motion to Amend is *denied*.

A. Related Proceeding

According to the Petition, the '417 patent is involved in at least the following lawsuit: *Mako Surgical Corp. v. Blue Belt Techs., Inc.*, Case No. 14-cv-61263 (S.D. Fla.), filed May 30, 2014. Pet. 1–2.

B. The '417 Patent

The '417 patent relates to a method and system for removing tissue or other material in dentistry or surgery. Ex. 1001, 1:7–10, 6:12–19. Figure 1 is reproduced below:

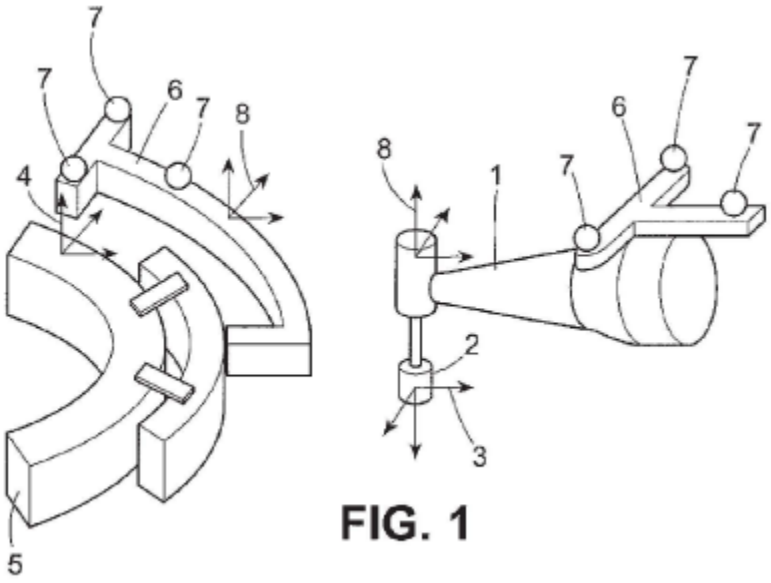

FIG. 1

Figure 1 illustrates a medical instrument with a tissue-removing effector 2 in a position and orientation relative to a reference position of tissue object 5, in accordance with the invention. Ex. 1001, 8:50–53. The effector can be implemented as a saw blade, cutter, drill, laser, etc., which can be powered on or off according to the position of the effector relative to the reference position of the tissue object. *Id.* at 8:53–65. The effector may have one or more markers 7, such as glass spheres, secured in a fixed position relative to the effector on marker support 6. *Id.* at 8:65–9:5. In general, the markers are a set of points whose position relative to a position coordinate system can be determined. *Id.* at 9:5–10. Various measurement methods, including optical, acoustical, electromagnetic, etc., can be used. *Id.* at 9:10–15. A physician or dentist uses information obtained from, e.g.,

an X-RAY or CT-image, to plan a cut volume to allow fitted pieces to be integrated within the fitted shape of the residual tissue volume. *Id.* at 9:33–60; 10:8–12; 12:60–65. Importantly, the invention prevents accidental tissue removal outside the fitted shape by powering off the effector when its position is outside of the cutting geometry. *Id.* at 13:17–28.

C. Illustrative Claim

Claims 1 and 40 are independent claims. Claims 3, 5–7, 9, 10, 16, 17, 21, and 26 directly or indirectly depend from claim 1, and claims 45, 56, and 57 directly or indirectly depend from claim 40. Claim 1 is reproduced below.

> 1. A method for removing and processing material with at least one effector, wherein the effector defines a volume and has a predetermined geometry, the method comprising:
>
> removing and processing material from an object with the effector, wherein the removing and processing comprises:
>
> manually guiding the effector in relation to the object;
>
> determining, using a navigation system, position and orientation of the effector in relation to at least one reference body as the effector removes material from the object;
>
> storing data representative of the position and orientation of the effector in relation to the reference body as the effector removes the material from the object; and
>
> supplying at least one of power and parameterization control commands to the effector as a function of at least one of a predetermined work volume for the object, volume of the material removed from the object and volume of residual material in the work volume, wherein the removed material volume and the residual material volume

> are determined based on the volume and the geometry of the effector and the position and orientation of the effector data.

Ex. 1001, 17:40–63.

D. Pending Ground of Unpatentability

The pending ground of unpatentability challenges claims 1, 3, 5–7, 9, 10, 16, 17, 21, 26, 40, 45, 56, and 57 as obvious, under 35 U.S.C. § 103(a), over the combined teachings of Mushabac[1] and Klimek.[2] Petitioner also relies on the Declarations of Dr. Brian Davies in support of its contentions (Ex. 1002; Ex. 1012).

E. Level of Ordinary Skill in the Art

Petitioner's declarant, Dr. Davies, testifies that a person of ordinary skill in the art, for purposes of the '417 patent, would have had a "Master's or Doctorate degree with a concentration in mechanical or medical engineering from an accredited engineering program with an area of emphasis of medical robotics and at least two years of relevant experience in industry." Ex. 1002 ¶ 16. Patent Owner's declarant, Dr. Robert Howe, testifies that a person of ordinary skill in the art would have had "at least a bachelor's degree in mechanical, electrical, or biomedical engineering or computer science and at least five years of experience developing or researching image-guided medical devices and procedures or surgical robotics." Ex. 2023 ¶ 21.

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[1] U.S. Patent No. 5,562,448, issued Oct. 8, 1996 (Ex. 1004) ("Mushabac").
[2] Klimek, et al., "A Passive-Marker-Based Optical System for Computer-Aided Surgery in Otorhinolaryngology: Development and First Clinical Experiences," *The Laryngoscope*, Vol. 109, pp. 1509–1515, Sept. 1999 (Ex. 1005) ("Klimek").

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