UNITED STATES PATENT AND TRADEMARK OFFICE

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

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 13/745,249 | 01/18/2013 | Ehud (Udi) Daon | NaviSurg-3-522-11920 | 9771 |

77741 7590 12/27/2019

Brannon Sowers & Cracraft PC
47 South Meridian Street
Suite 400
Indianapolis, IN 46204

| EXAMINER | |
|---|---|
| LINDSAY, BERNARD G | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2119 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 12/27/2019 | 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):

docket@bscattorneys.com

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

*Ex parte* EHUD (UDI) DAON

---

Appeal 2018-002541
Application 13/745,249
Technology Center 2100

---

Before DENISE M. POTHIER, JOHN P. PINKERTON, and JASON J. CHUNG, *Administrative Patent Judges*.

PINKERTON, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant[1] appeals under 35 U.S.C. § 134 from the Examiner's Final Rejection of claims 1–24, which are all of the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Navigate Surgical Technologies, Inc. Appeal Br. 1.

## STATEMENT OF THE CASE

### *Introduction*

Appellant generally describes the disclosed and claimed invention as follows:

> The present invention includes a method, system and software for dynamically creating an automatic patient tracking device specific to each patient without the need to take multiple X-ray or CT scans or to make patient specific casts. The automatic patient tracking device allows automatic surgical motion tracking in a regular clinical setting. The method may be used to reduce the time of admitting patient to a surgery significantly.
>
> The system uses particularly configured software to create a mount that may be employed to attach a tracking marker to patient specific anatomy. For example, in the example of dental surgery the method, system and software of the present invention may be used to manufacture a tight fitting splint or mount to which may be attached a tracking marker that is tracked by the motion tracking system.

Spec. ¶ ¶ 4–5.[2]

Independent claim 1, which is reproduced below, is representative of the subject matter on appeal:

> 1. A method for making a trackable mount for assisting with surgery within a surgical site, the mount trackable by a tracker disposed to obtain image information from the surgical site, the method, comprising:

[2] Our Decision refers to the Final Office Action mailed Dec. 2, 2016 ("Final Act."), Appellant's Appeal Brief filed Aug. 14, 2017 ("Appeal Br.") and Reply Brief filed Jan. 2, 2018 ("Reply Br."), the Examiner's Answer mailed Nov. 2, 2017 ("Ans."), and the original Specification filed Jan. 18, 2013 ("Spec.").

> creating a software model of the trackable mount based on scan data of the surgical site, the software model being based on the three dimensional shape of a single marker that is tracked by a tracker based on the marker shape; and
>
> making the trackable mount based on the software model.

Claims App. 19.[3]

*Rejections on Appeal*

Claim 4 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. Final Act. 4–5.

Claims 1–5, 7, 8, and 10–24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Franklin et al. (US 2005/0085719 A1; published Apr. 21, 2005) ("Franklin") in view of Plaskos et al. (US 2007/0239169 A1; published Oct. 11, 2007) ("Plaskos"). Final Act. 5–20.

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Franklin and Plasko, in view of Sonenfeld et al. (US 2008/0171305 A1; published July 17, 2008) ("Sonenfeld"). Final Act. 20–22.

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Franklin and Plaskos, in view of Cinader (US 2008/0026338 A1; published Jan. 31, 2008). Final Act. 22–23.

## ANALYSIS

*Rejection for Indefiniteness*

[3] The pages of the Appeal Brief are unnumbered. Accordingly, we consider the title page to be page number 1, and each of the following pages to be numbered consecutively thereafter.

The Examiner rejects claim 4 under 35 U.S.C. § 112, second paragraph, for indefiniteness. Final Act. 4–5. Claim 4 depends directly from claim 2, and indirectly from claim 1, and recites, *inter alia,* "confirming that the model exterior shape allows the trackable mount to be mountable at the location in a *stable condition*." Claims App. 19–20 (emphasis added). The Examiner finds the term "stable condition" is not clear because it "is open to very wide interpretation depending on the context." Final Act. 4. The Examiner also finds that, for example, "an object could be stable in a vertical or horizontal sense—or both; or it could be stable to within some prescribed tolerance," which may vary depending on the type of surgery. *Id.* at 4–5. The Examiner further finds that different surgeons may determine subjectively what a "stable condition" may be in a given set of circumstances, "thus failing to definitively allow determination of the metes and bounds." *Id.* at 5. The Examiner further finds, in response to Appellant's argument that a computer programmer of ordinary skill would know the meaning of the term "stable condition," that "the skills/training of a computer programmer . . . are not known to include determining the stable positioning of surgical devices." Ans. 19.

Appellant argues that a person of ordinary skill in the art would understand the term "stable condition" because the Specification describes "the process of identifying the appropriate mount shape for dental, arm, and knee surgery and the mounting location so that 'the identified exterior shape may stably fit on the selected location.'" Appeal Br. 11 (citing Spec. ¶¶ 62–64). Appellant also argues that the Examiner's focus on various types of surgery and different surgeons "misses the point" because the term "stable condition" refers to the trackable mount's connection to the mounting

location within the software model and "[t]he person of ordinary skill is not a surgeon, it is a person creating the software model, e.g., a computer programmer with experience in the medical imaging and modeling fields." *Id.* at 12; *see also* Reply Br. 2.[4] Appellant further argues:

> While it is possible for different surgeons to have different opinions on what constitutes "stable condition," the context of this claim recitation relates to the software model, and within the software model the mounting of the trackable mount to the location may be definitively and objectively determined on the basis of calculated values without the aid of a surgeon, and thus the metes and bounds of the [c]laim may be fairly ascertained by one of ordinary skill.

*Id.*

Under 35 U.S.C. § 112, second paragraph, the test for definiteness is whether "those skilled in the art would understand what is claimed when the claim is read in light of the specification." *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576 (Fed. Cir. 1986). Language in a claim is unclear if, when given its broadest reasonable interpretation, it is "ambiguous, vague, incoherent, opaque, or otherwise unclear in describing and defining the claimed invention . . . ." *In re Packard*, 751 F.3d 1307, 1311 (Fed. Cir. 2014).

We are persuaded by Appellant's arguments that the Examiner erred. First, we agree with Appellant that a person of ordinary skill in the art would understand the term "stable condition" because the Specification describes determining whether the trackable mount with the identified shape "may stably fit" or "be stably mounted" on the selected location. Spec. ¶ 63. As

[4] The pages of the Reply Brief are also unnumbered. Accordingly, we consider the title page to be page number 1, and each of the following pages to be numbered consecutively thereafter.

stated *supra*, the Examiner finds that an object could be "stable in a vertical or horizontal sense" or "within some prescribed tolerance." Final Act. 19. Although we agree with the Examiner that claim 4 is broad in this respect, "[b]readth is not indefiniteness." *In re Gardner*, 427 F.2d 786, 788 (CCPA 1970).

Second, considering claim 4 in the context of claims 1 and 2, we agree with Appellant that the context of claim 4 relates to creating "the software model" of the trackable mount. *See* Reply Br. 2. Thus, we also agree with Appellant that the person of ordinary skill in the field of implementing medical imaging technology would be a computer programmer who "would have insight into the meaning of 'confirming that the model exterior shape allows the trackable mount to be mountable at the location in a stable condition' step of [c]laim 4." *Id.* We further agree with the Appellant that because the context of claim 4 relates to creating the software model, "the mounting of the trackable mount to the location may be definitively and objectively determined on the basis of calculated values without the aid of a surgeon or other information, and thus the metes and bounds of the [c]laim may be fairly ascertained by one of ordinary skill." *Id.*

Thus, we determine that claim 4 is not indefinite because for the reasons discussed *supra*, the term "stable condition" is not ambiguous or unclear, and the scope of the claim would be reasonably ascertainable to a person of ordinary skill in the art. Accordingly, we do not sustain the Examiner's rejection of claim 4 under 35 U.S.C. § 112, second paragraph.

*Section 103(a) Rejections*

The dispositive issue raised by the arguments in Appellant's Briefs is whether the combination of Franklin and Plaskos teaches or suggests creating the trackable mount "software model being based on the three dimensional shape of a single marker that is tracked by a tracker based on the marker," as recited in method claim 1, and as similarly recited in independent claims 12 and 20.[5]

The Examiner rejects claim 1 under 35 U.S.C. § 103(a) for obviousness over the combination of Franklin and Plaskos. Final Act. 6–7. In particular, the Examiner finds, and we agree, that Franklin teaches a method for making a trackable mount for assisting with surgery within a surgical site because Franklin teaches making a customized surgical fixture, to which a tracking fixture having tracking markers, such as light-emitting diodes, is attached, and that the markers are tracked during surgery by a camera array. Final Act. 6 (citing Franklin, code (57); Figs. 12, 13; ¶¶ 12, 105, 107). The Examiner also finds that Franklin teaches "creating a software model of the trackable mount based on scan data of the surgical site, the software model being based on the three dimensional shape of a single marker." *Id.* (citing Franklin, code (57); Figs. 2, 11; ¶¶ 5, 17, 40, 41, 49, 114, 115). However, the Examiner finds that Franklin "fails to clearly specify a single marker that is tracked by a tracker based on the marker shape." *Id.* at 7. In that regard, the Examiner finds "Plaskos teaches a single marker that is tracked by a tracker based on the marker shape." *Id.* at 7

[5] Appellant argues the claims as a group focusing on claim 1. *See* Appeal Br. 6–11. Accordingly, we select claim 1 as representative, and the remaining claims stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).

(citing Plaskos ¶¶ 8, 21, 39–41, Figs. 4, 5 (finding "single reference marker 100 is tracked based on the marker shape")).

Appellant argues that although Franklin discloses surgical fixtures having markers, Franklin lacks any disclosure, teaching, or suggestion of "creating the solid model based on a marker, much less on the shape of a marker." Appeal Br. 13. Although Appellant notes that "the tracking markers of Franklin inherently 'have a three-dimensional shape and are mounted in the surgical fixture [¶¶ 12, 105, 107, Figs. 12, 13],'" Appellant argues there is no teaching or suggestion in Franklin or any of the cited art "that the shape of the marker is in any way used to track the marker and thus develop the software model." Reply Br. 3–4. Appellant also argues that, "[c]ontrary to the Examiner's unsubstantiated allegations, nothing in Plaskos discloses, teaches or suggests tracking on the three dimensional shape of the tracking marker." Appeal Br. 14 (citing Plaskos ¶¶ 8, 21, 39–41). According to Appellant, the disclosure of Plaskos "unambiguously states that reference marker 100 is tracked by the location of lines within the camera image, rather than ascertaining the shape of marker 100." *Id.*; *see* Plaskos ¶ 40 ("reference marker 100 is a pyramid shaped rigid body with 360 degrees of visibility by means of using bars or struts 120, which are identified as lines in 2D camera images"); *see also* Reply Br. 4 (arguing that Plaskos "has bars or struts that have a shape," but Plaskos identifies these items "as lines in 2D camera images").

We are not persuaded by Appellant's arguments that the Examiner erred. First, contrary to Appellant's arguments, we agree with the Examiner's findings that Franklin teaches creating a software model of the trackable mount based on scan data of the surgical site and based on the

three dimensional shape of tracking markers. *See* Final Act. 6 (citing Franklin, code (57), ¶¶ 5, 12, 40, 41, 49, 105, 107, 114, 115, Figs. 2, 11–13). In particular, the Examiner finds, and we agree, Franklin teaches "a solid model is computed based on a scanned image of a patient," and "a library (database) of standard fixtures 1120" can optionally be used. *Id.* (*see* Franklin ¶¶ 114–115). Paragraph 49 of Franklin describes that "after scanning markers 122 are attached to bone anchors 120, the patient is scanned . . . producing a three-dimensional image," which is transferred to a computer where it is stored. Paragraph 12 of Franklin describes "multiple tracking markers, such as light-emitting diodes, can be attached to a tracking fixture that is then attached to the surgical fixture" and "tracking locations of the tracking markers relative to a . . . camera array." In addition, paragraph 105 of Franklin describes that "[t]racking markers 1215 light-emitting diodes . . . three-dimensional location can be tracked using . . . a camera array." Thus, we agree with the Examiner's finding that the software model is based not only on "scan data of the surgical site," but is also based on the three dimensional shape of markers, such as "scanning markers 122" and "light-emitting diodes."

Second, contrary to Appellant's arguments, we agree with the Examiner that Plaskos teaches "a single reference marker 100 that is tracked based on the marker shape." Final Act. 7. Specifically, the Examiner finds, and we agree, that Plaskos teaches "tracking the relative movement of a reference marker" because paragraph 8 of Plaskos describes "tracking the relative movement of a reference marker attached to the object" and paragraph 21 explains that "[d]etecting and determining the position and orientation of an object is referred to herein as 'tracking' the object." The

Examiner also finds, and we agree, that Plaskos teaches tracking reference marker 100 based on its three dimensional shape. Final Act. 7 (citing Plaskos ¶¶ 39–41; Figs. 4–5). In that regard, Plaskos describes "reference marker 100 is a pyramid shaped rigid body with 360 degrees of visibility by means of using bars or struts 120, which are identified as lines in 2D camera images." Plaskos ¶ 40. In other words, Plaskos's marker 100 has the overall three dimensional shape of a pyramid, and it has 360 degrees of visibility because it is made of bars or struts 120, which also have a three dimensional shape. Thus, although any particular bar or strut is depicted as a line in a 2D camera image, we agree with the Examiner that the marker 100 is tracked based on its three-dimensional shape because marker 100 and the bars or struts 120 of which it is composed have a three-dimensional shape.[6]

On the record before us, we find the preponderance of the evidence supports the Examiner's (1) finding that the combined teachings of Franklin and Plaskos teach or suggest the disputed limitation of claim 1 and (2) conclusion that the combined teachings and suggestions of Franklin and Plaskos would have rendered the subject matter of claim 1 obvious under 35 U.S.C. § 103(a). Thus, we sustain the Examiner's rejection of claim 1. For the same reasons, we sustain the Examiner's rejections of independent claims 12 and 20, and dependent claims 2–11, 13–19, and 21–24, which are

[6] Although we agree with the Examiner's § 103 findings in the Final Action, as discussed *supra* and from which this appeal is taken, we disagree with the Examiner's statement in the Answer to the extent the Examiner finds a single bar or strut encompasses the claimed "marker shape." Ans. 20. Nonetheless, the overall disposition of this Decision is still an affirmance because we agree with the Examiner's § 103 analysis in the Final Action.

not argued separately and fall together with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).

## CONCLUSION

We reverse the Examiner's rejection of claim 4 under 35 U.S.C. § 112, second paragraph, for indefiniteness.

We affirm the Examiner's rejection of claims 1–5, 7, 8, and 10–24 under 35 U.S.C. § 103(a) as being unpatentable over Franklin and Plaskos.

We affirm the Examiner's rejection of claim 6 under 35 U.S.C. § 103(a) as being unpatentable over Franklin, Plaskos, and Sonenfeld.

We affirm the Examiner's rejection of claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Franklin, Plaskos, and Cinader.

Because we affirm at least one ground of rejection with respect to each claim on appeal, the Examiner's decision is affirmed. *See* 37 C.F.R. § 41.50(a)(1).

## DECISION SUMMARY

In summary:

| **Claims Rejected** | **35 U.S.C. §** | **Reference(s)/Basis** | **Affirmed** | **Reversed** |
|---|---|---|---|---|
| 4 | 112, 2nd paragraph | Indefiniteness | | 4 |
| 1–5, 7, 8, 10–24 | 103(a) | Franklin, Plaskos | 1–5, 7, 8, 10–24 | |
| 6 | 103(a) | Franklin, Plaskos, Sonenfeld | 6 | |
| 9 | 103(a) | Franklin, Plaskos, Cinader | 9 | |
| **Overall Outcome** | | | 1–24 | |

TIME PERIOD FOR RESPONSE

No period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv). *See* 37 C.F.R. § 41.50(f).

AFFIRMED