



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.
14/932,156	11/04/2015	Zachary B. Suttin	5394.C87US1	4757
104326	7590	08/21/2020	EXAMINER	
Schwegman Lundberg & Woessner / Zimmer			FOLGMANN, DREW S	
P.O. Box 2938			ART UNIT	PAPER NUMBER
Minneapolis, MN 55402			3772	
			NOTIFICATION DATE	DELIVERY MODE
			08/21/2020	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):

SLW@blackhillsip.com
USPTO@slwip.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ZACHARY B. SUTTIN and STEPHEN S. PORTER

Appeal 2019-006264
Application 14/932,156
Technology Center 3700

Before BIBHU R. MOHANTY, PHILIP J. HOFFMANN, and
CYNTHIAL. MURPHY, *Administrative Patent Judges*.

HOFFMANN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the
Examiner’s rejection of claims 17–32. We have jurisdiction under 35 U.S.C.
§ 6(b).

We AFFIRM IN PART.

¹ We use the word “Appellant” to refer to “applicant” as defined in
37 C.F.R. § 1.42. Appellant identifies “BIOMET 3I, LLC,” as the real party
in interest. Appeal Br. 3.

According to Appellant, the “disclosure relates to using a robotic system to . . . automatically perform a variety of dental procedures and/or . . . monitor a manually performed dental procedure, thereby generating positional data of the robotic system that is usable in creating a modified three-dimensional model.” Spec. ¶ 2. Claims 17, 29, and 30 are the independent claims on appeal. Below, we reproduce claim 17 as illustrative of the appealed claims.

17. A method of creating a post-operative virtual model of at least a portion of a mouth of a patient, the mouth including a dental implant installed using a robotic system during a dental surgical procedure, the method comprising:

- attaching a rigid grounding member to a fixed position within the mouth of the patient;
- obtaining a pre-operative virtual model of the mouth of the patient with the rigid grounding member therein;
- coupling a grounding arm of the robotic system to the rigid grounding member in the mouth of the patient, thereby establishing an origin for the mouth of the patient;
- moving, as part of the dental surgical procedure, at least a portion of a working arm of the robotic system coupled to a dental-implant-driving tool to install the dental implant in the mouth of the patient;
- monitoring, during the dental surgical procedure, a position of the grounding arm and the working arm to generate positional data related to the location of the dental-implant-driving tool relative to the established origin; and
- creating, without scanning, a post-operative virtual model of the at least a portion of the mouth of the patient based on the obtained pre-operative virtual model and the generated positional data, the post-operative virtual model including a virtual dental implant that corresponds to a location and orientation of the dental implant in the mouth of the patient.

Appeal Br., Claims App.

REJECTIONS AND PRIOR ART

The Examiner rejects the claims as follows:

- I. Claims 17–28 under 35 U.S.C. § 112(b) as indefinite;
- II. Claims 17–22, 24–26, and 29–32 under 35 U.S.C. § 103 as unpatentable over Mushabac (US 2002/0133095 A1, published Sept. 19, 2002) (“Mushabac’095”), Akeel et al. (US 2015/0057675 A1, published Feb. 26, 2015) (“Akeel”), and Choi et al. (US 2014/0178832 A1, published June 26, 2014) (“Choi”);²
- III. Claim 23 under 35 U.S.C. § 103 as unpatentable over Mushabac’095, Akeel, Choi, and Berckmans, III, et al. (US 2009/0263764 A1, published Oct. 22, 2009) (“Berckmans”);
- IV. Claim 27 under 35 U.S.C. § 103 as unpatentable over Mushabac’095, Akeel, Choi, and Kamer (US 2010/0137881 A1, published June 3, 2010); and
- V. Claim 28 under 35 U.S.C. § 103 as unpatentable over Mushabac’095, Akeel, Choi, Kamer, and Mushabac (US 4,182,312, issued Jan. 8, 1980) (“Mushabac’312”).

ANALYSIS

Rejection I—Indefiniteness rejection of claims 17–28

The Examiner rejects independent claim 17 as indefinite. Answer 3. Specifically, the Examiner states that claim 17’s preamble . . . is indefinite. The preamble recites ‘a method of creating a post-operative virtual model’ but comprises steps ‘as

² Here, we combine two rejections from the Final Office Action.

part of the dental surgical procedure’ and ‘during the dental surgical procedure.’ Furthermore, it is unclear if the method is directed to a surgical procedure or modeling. Therefore, it is unclear what is encompassed therein.

Id. We disagree with the Examiner, however, and agree with Appellant that the claim is definite. Appeal Br. 9–10. In particular, we agree with Appellant that the claim is clear in reciting a “‘method of creating a post-operative virtual model’ [that] includes the [recited] surgical steps.” *Id.* Consequently, we do not sustain claim 17’s indefiniteness rejection.

The Examiner rejects dependent claim 26³ as indefinite, stating that “the limitation ‘wherein the origin for the mouth is a single origin’ is indefinite. It is unclear what is encompassed therein.” Answer 15. Appellant argues that the claim is definite, as it recites that “the origin (i.e., the reference point) defined in claim 17 [(from which claim 26 depends)] is further define[d] as a single origin or point of reference compared to having multiple reference points within the mouth.” Appeal Br. 10. Conversely, the Examiner provides no reasoning in either the Final Office Action or the Answer, and thus the Examiner does not support adequately that claim 26 is indefinite. *See* Final Action 2; *see* Answer 3, 15. Therefore, we do not sustain claim 26’s indefiniteness rejection.

The Examiner rejects dependent claim 28 as indefinite, stating that this claim “recites the limitation ‘the ground probe.’ There is insufficient antecedent basis for this limitation in the claim. For examination purposes the limitation is construed to be dependent from claim 27 rather than

³ We note that the Examiner corrects the error in identifying the claim number from the Final Office Action. *See* Final Action 2; *see, e.g.*, Answer 15.

claim 26.” Answer 3. Appellant does not argue against the indefiniteness rejection. However, the Claims Appendix that Appellant filed with the Appeal Brief indicates that claim 28 depends from claim 27, such that claim 28 does not appear to lack antecedent basis.

Based on our review of the prosecution history, it appears that on April 25, 2018, Appellant filed an Amendment adding new claim 28 depending from claim 26, such that claim 28’s recitation “the grounding probed” did not have antecedent basis. Amendment filed April 25, 2018, 3–4. On December 7, 2018, after the Examiner issued a Final Office Action, Appellant filed an Amendment changing the dependency of claim 28 from claim 26 to claim 27. *See* Amendment file December 7, 2018, 4. In an Advisory Action mailed January 28, 2019, however, the Examiner expressly indicates that the amendment is not entered, because “[t]he change in dependency of claim 28 requires further search and consideration.” Advisory Action 1. Thus, Appellant improperly indicates in the Appeal Brief’s Claim Appendix that claim 28 depends from claim 27. Consequently, we sustain the Examiner’s indefiniteness rejection of claim 28.

Also, Appellant also does not address the Examiner’s second reason for determining that claim 28 is indefinite—because “the limitation ‘biased outward away from a second central axis of the grounding probe’ is indefinite. It is unclear what is encompassed therein.” Answer 3. Appellant’s failure to address the Examiner’s determination provides a further basis for our sustaining claim 28’s indefiniteness rejection.

Rejection II—Obviousness rejection of claims 17–22, 24–26,
and 29–32

Independent claim 17 and its dependent claims 18–22
and 24–26

Independent claim 17 recites, in relevant part,

[a] method of creating a post-operative virtual model of at least a portion of a mouth of a patient, the mouth including a dental implant installed using a robotic system during a dental surgical procedure, the method comprising . . .

monitoring, during the dental surgical procedure, a position of the grounding arm and the working arm to generate positional data related to the location of the dental-implant-driving tool relative to the established origin; and

creating, without scanning, a post-operative virtual model of the at least a portion of the mouth of the patient based on the obtained pre-operative virtual model and the generated positional data, the post-operative virtual model including a virtual dental implant that corresponds to a location and orientation of the dental implant in the mouth of the patient.

Appeal Br., Claims App. Restated, claim 17 recites creating, without scanning, the post-operative virtual model of a portion of the patient's mouth based on the pre-operative virtual model and the positional data that is generated during the dental procedure.

Appellant argues that the Examiner's obviousness rejection of claim 17 is in error because no reference or combination of references discloses creating the post-operative virtual model based on positional data generated during the dental procedure. Appeal Br. 15–17. The Examiner determines that although

Mushabac['095]/Akeel discloses the invention substantially as claimed including taking preoperative scans and making a preoperative model . . . , they fail to disclose creating without scanning, a post-operative virtual model of the at least a portion of the mouth of the patient based on the obtained pre-

operative virtual model and the generated positional data, the post-operative virtual model including a virtual dental implant that corresponds to a location and orientation of the dental implant in the mouth of the patient.

Id. at 7. Thus, the Examiner appears to rely on Choi to disclose this recitation. *See* Final Action 8.

In the Appeal Brief, Appellant argue that “Choi, on the other hand, creates a virtual treatment plan including virtual implants **before any drilling/implanting** of the actual patient has occurred and creates a surgical drilling guide”—i.e., Choi does not disclose creating, without scanning, the post-operative virtual model of a portion of the patient’s mouth based on the pre-operative virtual model and the positional data that is generated during the dental procedure, as claim 17 recites. Appeal Br. 16. In response, the Examiner states that this argument is unpersuasive because “Appellant’s arguments [are] against the references individually,” and that

Appellant has failed to address the combination of Mushabac/Akeel and Choi. The language of ‘combine any pre-operative models with generated positional data’ is not consistent with claim terminology as currently presented. Choi was only relied upon to teach generating a post-operative model based on pre-operative data. Choi discloses a system for producing a model . . . based on pre-obtained scan/3d image data (pre-operative models) . . . which allows to place virtual implant in the patients mouth . . . and would thus produce a post-operative model based on pre-operative model data. Therefore, Appellant’s argument is not found to be persuasive and the grounds of rejection is upheld.

Answer 19–20 (citations omitted). It is not clear from this portion, or any other portion of the record, however, why it would have been obvious to create, without scanning, the post-operative virtual model of a portion of the

patient's mouth based on the pre-operative virtual model and the positional data that is generated during the dental procedure.

Consequently, we do not sustain the Examiner's obviousness rejection of independent claim 17, or of claims 18–22 and 24–26 that depend from, and the Examiner rejects with, claim 17. Further, each of independent claims 29 and 30 recites a similar recitation as that discussed above.

Therefore, we do not sustain the Examiner's obviousness rejection of independent claims 29 and 30, or of claims 31 and 32 that depend from claim 30, for the same reasons we do not sustain claim 17's rejection.

Rejections III–V—Obviousness rejections of claims 23, 27, and 28

Claims 23, 27, and 28 depend from independent claim 17. Above, we reverse claim 17's obviousness rejection. Inasmuch as the Examiner does not rely on Berckmans, Kamer, or Muchabac'312 to disclose anything that would remedy the above deficiency in claim 17's rejection, we do not sustain any of the Examiner's obviousness rejections of claims 23, 27, and 28.

CONCLUSION

We AFFIRM the Examiner's indefiniteness rejection of claim 28.

We REVERSE the Examiner's indefiniteness rejection of claims 17–27.

We REVERSE the Examiner's obviousness rejection of each of the claims.

In summary:

Claims Rejected	35 U.S.C. §	Basis/Reference(s)	Affirmed	Reversed
17-28	112(b)	Indefiniteness	28	17-27
17-22, 24-26, 29-32	103	Mushabac'095, Akeel, Choi		17-22, 24-26, 29-32
23	103	Mushabac'095, Akeel, Choi, Berckmans		23
27	103	Mushabac'095, Akeel, Choi, Kamer		27
28	103	Mushabac'095, Akeel, Choi, Kamer, Mushabac'312		28
Overall Outcome:			28	17-27, 29-32

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

AFFIRMED IN PART