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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SHUFANG DONG

Appeal 2019-006394
Application 14/787,329
Technology Center 3700

Before BENJAMIN D. M. WOOD, WILLIAM A. CAPP, and
JILL D. HILL, *Administrative Patent Judges*.

CAPP, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant¹ seeks our review under 35 U.S.C. § 134(a) of the final rejection of claims 1–3, 5–9, and 21–26. 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(a). Appellant identifies Koninklijke Philips N.V., as the Applicant and real party in interest. Appeal Br. 2.

THE INVENTION

Appellant's invention relates to a subject support platform for an imaging system. Spec. 1. Claim 1, reproduced below, is illustrative of the subject matter on appeal.

1. An imaging system, comprising:
 - a first scanner with a first examination region;
 - a subject support, including:
 - a tabletop configured to position a subject or object at least two different positions in the examination region, wherein a deflection of the tabletop is different at the at least two different positions; and
 - a base configured to position the tabletop vertically in the first examination region; and
 - a vertical drive system configured to produce an electrical signal indicative of a weight of a subject/object on the tabletop;
 - a subject/object weight estimator configured to estimate a weight of a subject or object on the tabletop based on the electrical signal;
 - a deflection delta predictor configured to predict a deflection delta of the tabletop between the at least two different positions based on the weight, a present horizontal position of the tabletop, a present vertical position of the base, and a predetermined deflection data look up table, which includes a deflection delta value for different combinations of weight, horizontal position of the tabletop, and vertical position of the base; and
 - wherein the predicted deflection delta value is used to correct for the deflection.

THE REJECTIONS

The Examiner relies upon the following as evidence in support of the rejections:

NAME	REFERENCE	DATE
Nasuta	US 5,393,939	Feb. 28, 1995
Bruns	US 5,666,295	Sept. 9, 1997
Bernstein	US 6,026,318	Feb. 15, 2000
Vaisburd	US 2002/0122575 A1	Sept. 5, 2002
Farooqui	US 2008/0235873 A1	Oct. 2, 2008
Aulbach	DE 102007060690 A1	June 25, 2009
NXT Motor Internals	non-patent literature	

The following rejections are before us for review:

1. Claims 23 and 26 are rejected under 35 U.S.C. § 112(a) as lacking written description support.
2. Claims 1–3, 5–9, 21, and 24 are rejected under 35 U.S.C. § 103 as being unpatentable over Vaisburd, Aulbach, and Nasuta.
3. Claims 22 and 25 are rejected under 35 U.S.C. § 103 as being unpatentable over Vaisburd, Aulbach, Nasuta, and Bruns.
4. Claims 23 and 26 are rejected under 35 U.S.C. § 103 as being unpatentable over Vaisburd, Aulbach, Nasuta, Bruns, Farooqui, NXT[®] Motor Internals, and Bernstein.

OPINION

Written Description – Claims 23 and 26

Claim 23 depends indirectly from independent system claim 1 and claim 26 depends from independent method claim 9. Claims App.

Claim 23 contains the following limitation.

a horizontal drive system, wherein the subject/object weight estimator extracts the weight from a horizontal motor current during an acceleration and a deceleration by averaging the acceleration or the deceleration and comparing the averaged acceleration or averaged deceleration with a calibrated value.

Id. Claim 26 contains a substantially similar limitation. *Id.* Appellant argues these claims together. Appeal Br. 3–4. We select claim 23 as representative. *See* 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner takes the position that the claimed subject matter is not described in Appellant’s disclosure in a manner that demonstrates that Appellant’s were actually in possession of the subject matter at the time of invention. Final Act. 4–5.

Appellant directs our attention to page 7 of the Specification which provides, in pertinent part, as follows:

In FIGURE 8, the device 526 includes the vertical drive system 512. For example, in one instance, the motor current of the motor of the vertical drive system 512 is used to estimate the weight. For this, the motor current can be the static vertical holding current. Then, by releasing the vertical holding brake and using the servo motor to hold the vertical position for a second or so, the motor current is sampled and averaged, and then compared with a calibrated value to extract the patient weight information. In alternative embodiments, the constant speed vertical motion current, or the *horizontal motor current during acceleration and deceleration phase can be used to extract the weight.*

Spec. 7, ll. 8–15 (emphasis added). Appellant argues that the italicized portion of the foregoing passage provides written description support for the claim. Appeal Br. 3–4.

In response, the Examiner states that Appellant’s Specification provides insufficient detail regarding how acceleration measurements can be

used to derive the weight of the patient. Ans. 3. According to the Examiner, knowledge of performing a weight calculation using a vertical drive does not readily translate to a horizontal drive. *Id.*

[T]he forces applied for the horizontal drive are more complicated since the tabletop with the patient weight is sliding horizontally with the additional friction force, reaction force and other forces applied and with some deformation/deflection of the table top as considered within the present invention with possible torque action which are affecting the acceleration or deceleration of the tabletop in some way that the Appellant did not describe in sufficient details such that one person of ordinary skills in the art would have been aware that the Appellants were actually in possession of such method at the time of the invention.

Id. at 4.

In reply, Appellant reiterates its position from the Appeal Brief and then asserts that

[T]he horizontal drive system motor current to maintain a given acceleration and deceleration, which is based on the weight on the tabletop, is translated via a corresponding calibration value to a weight of the subject on the tabletop.

Reply Br. 2.

The specification of a patent as filed must “contain a written description of the invention.” 35 U.S.C. § 112(a). A specification has an adequate written description when it “reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date” of the patent. *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). “The essence of the written description requirement is that a patent applicant, as part of the bargain with the public, must describe his or her invention so that the public will know what it is and that he or she has truly made the claimed invention.” *Nuvo*

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Pharmaceuticals (Ireland) Designated Activity Company v. Dr. Reddy's Labs Inc., 923 F.3d 1368, 1377 (Fed. Cir. 2019) quoting *AbbVie Deutschland GmbH & Co. v. Janssen Biotech, Inc.*, 759 F.3d 1285, 1298 (Fed. Cir. 2014). The purpose of the written description requirement is to prevent an applicant from later asserting that he invented that which he did not; the applicant for a patent is therefore required to recount his invention in such detail that his future claims can be determined to be encompassed within his original creation. *Amgen Inc. v. Hoechst Marion Roussel Inc.*, 314 F.3d 1313, 1330 (Fed. Cir. 2003) (citing *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1561 (Fed. Cir. 1991)).

The level of detail required to satisfy the written description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology. *Ariad*, 598 F.3d at 1351. With respect to generic claims, the Federal Circuit has set forth a number of factors for evaluating the adequacy of the disclosure, including the existing knowledge in the particular field, the extent and content of the prior art, the maturity of the science or technology, and the predictability of the aspect at issue. *Id.*

In the instant case, neither Appellant nor the Examiner provides analysis or discussion of the various *Ariad* factors listed above. The Examiner fails to convincingly explain why a person of ordinary skill in the art would not understand that Appellant possessed the invention merely by stating the intended result. On the other hand, Appellant's disclosure provides little or no actual teaching and essentially presumes that a person of ordinary skill in the art already knows how to determine weight based on

horizontal motor drive current.² We find this aspect of the disclosure to be somewhat troubling, but the issue goes more to whether the subject matter of the claim is enabled as opposed to whether there is written description support. Enablement is a different requirement from that of written description support to demonstrate possession.³ *Carnegie Mellon University v. Hoffmann-La Roche Inc.*, 541 F.3d 1115, 1121 (Fed. Cir. 2008); *see also Ariad*, 598 F.3d at 1344. The claims here have adequate support to demonstrate possession.

We do not sustain the Examiner's Section 112 written description rejection of claims 23 and 26.

*Unpatentability of Claims 1–3, 5–9, 21, and 24
Over Vaisburd, Aulbach, and Nasuta*

Appellant argues claims 1–3, 5–9, 21, and 24 as a group. Appeal Br. 4–6. We select claim 1 as representative. 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner finds that Vaisburd discloses the invention substantially as claimed except for measuring/estimating the weight of a subject with a vertical drive system, for which the Examiner relies on Aulbach and Nasuta.

² We are mindful that the laws of physics relating to forces to overcome friction and move a mass in a horizontal direction are well-known and generally understood by an artisan of ordinary skill. *See Streck, Inc. v. Research & Diagnostic Sys., Inc.*, 665 F.3d 1269, 1288 (Fed. Cir. 2012) (explaining that a patent preferably omits what is well known in the art). We do not believe that more than ordinary skill is required to correlate such forces with motor current.

³ We decline to enter a new ground of rejection based on lack of enablement. The Board enters a new ground of rejection at its discretion, and no inference should be drawn from a failure to exercise that discretion. *See* 37 C.F.R. § 41.50(b); *see also* Manual of Patent Examining Procedure (MPEP) § 1213.02.

Final Act. 5–9. The Examiner concludes that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Vaisburd by the teachings of Aulbach and Nasuta to achieve the claimed invention. *Id.* at 7–9. According to the Examiner, a person of ordinary skill in the art would have done this to provide a height correction capability and improved positioning of tumors detected by multiple modalities. *Id.*

Appellant argues that Aulbach does not disclose a deflection delta predictor that predicts a deflection delta based on a vertical position of the base. Appeal Br. 5. Appellant argues that Aulbach is limited to actual deflection delta based on actual vertical height of the table top. *Id.* Similarly, Appellant argues that Vaisburd does not predict a deflection delta as claimed. *Id.* (“[N]o prediction is made”).

In response, the Examiner looks to page 1 and Figs. 2–4 of Appellant’s disclosure to determine the meaning of “deflection delta.” Ans. 4. The Examiner quotes Appellant as disclosing that “[t]he difference between the deflections 206 and 306, or a deflection delta, represents a vertical height difference of the table top 114 at the two different locations.” Ans. 4–5; Spec. p. 1, ll. 18–20. The Examiner provides annotated versions of Appellant’s Figures 2–4 to illustrate the point. Ans. 5. Referring to the laws of physics, the Examiner interprets “deflection delta” as a value that is independent of the vertical position of either the tabletop or the “base” on which the tabletop rests. *Id.* at 6. With respect to Appellant’s “prediction” argument, the Examiner notes the similarity between Appellant’s disclosure and that of Vaisburd. Ans. 7 (citing Vaisburd, ¶¶ 44, 51–53; Figs. 2, 3A, and 3B).

Furthermore, the Examiner notes an anomaly regarding Appellant's use of the term "predict":

[T]he examiner is pointing out that the term "predict" appears to be used in the claim out of context, since the determination/prediction of the deflections is initially based on the distributed weight of the tabletop with or without the patient and the horizontal overhanging distance of the patient support, for which the examiner provided the combined teachings of Vaisburd and Aulbach. The total correction along the vertical direction is performed/predicted after the determination/prediction of the deflections or deflection delta since the specification appears to define the deflection delta as the difference between two deflections with the same reference/vertical position.

Ans. 8.

In reply, Appellant argues that the predicted deflection delta is dependent upon the height of the base. Reply Br. 4. Appellant further argues that the Examiner's rejection is erroneously based on deflections that are "actually measured." *Id.*

Appellant's invention, as well as Vaisburd and Aulbach, all deal with the effect of the force of gravity on the extended portion of a cantilevered platform. According to well-known laws of physics, the far end of a cantilevered platform will deflect downwardly as a function of: (1) the amount of weight that is distributed over the cantilevered portion of the platform; and (2) the distance that such weight is offset away from the base that provides vertical support for the platform. Practitioners would also understand that the amount of deflection can be affected by the relative rigidity or flexibility of the platform and the materials used therein. *See, e.g., Vaisburd* ¶ 39. Practitioners understand that increasing the amount of weight tends to increase the amount of deflection at the far end of the

platform. Increasing the horizontal offset distance of the weight relative to the location of the base support also tends to increase the amount of deflection.⁴

Vaisburd addresses a known problem in multi-modality imaging systems. Vaisburd ¶¶ 3–5. “If two images are not aligned properly, then the comparison of findings from one image with those of another image will be faulty.” *Id.* ¶ 3. Vaisburd recognizes that image alignment from successive imaging devices in multi-modality imaging systems is affected by the amount of differential “sag” that occurs as a cantilevered stretcher is extended. *Id.* ¶ 5. “As a result of the differential sag, the images from the various imaging systems are not properly aligned.” *Id.*

Vaisburd discloses a multi-modality imaging system including near imaging volume 220 and far imaging volume 210. *Id.* ¶ 31, Fig. 1. It further discloses stretcher 100 that accommodates a subject. *Id.* ¶ 30, Fig. 1. Stretcher 100 extends, in a cantilevered manner, into gantry 200 that houses imaging volumes 210, 220. *Id.* ¶¶ 30–32, Fig. 1. Stretcher 100 is supported by table 120. *Id.* Fig. 1.

Vaisburd teaches that stretcher 100 “sags” as the stretcher extends toward gantry 200. *Id.* ¶ 33, Fig. 2. Vaisburd explains how the amount of sag can be calculated for those parts of stretcher 100 that are currently in volume 210 based on measurements of the actual amount of sag that takes place in volume 220. *Id.* ¶¶ 33–36, Figs. 2–5.

[W]hen stretcher extension a is large enough that the edge of stretcher 100 reaches imaging plane 222, the sag of stretcher 100 at imaging plane 212 may be determined by measuring the sag in the far imaging system at plane 222 and

⁴ These principles are familiar to any lay person that has walked to the end of a diving board at a swimming pool.

calculating the sag in the near imaging system at plane 212. The sag at imaging plane 212 may thus be determined again at another extension of stretcher 100 further into volume 220, or even beyond volume 220.

Id. ¶ 35.

Appellant’s argument that Vaisburd’s deflections are “actually measured” is inconsistent with Vaisburd’s foregoing disclosure regarding “calculating the sag.” Reply Br. 4, Vaisburd ¶ 35. In that regard, we note that claim 1 “predicts” a deflection data based on a “present horizontal position” of the table top. Thus, both Vaisburd and Appellant’s system start with a known “present horizontal position” of the table top and then determine, calculate, estimate, or “predict” the amount of sag or deflection at a second horizontal position.

Furthermore, Appellant’s argument that the deflection delta depends on the height of the base (Reply Br. 4) cannot be reconciled with well-known scientific principles. The rotational moment at the base is a function of the weight and offset distance of the weight from the base. Such rotational moment does not change as base 508 is raised or lowered unless one considers that Appellant’s base 508 also deflects with Appellant’s table top 510, which is something that is not taught in Appellant’s Specification. *See generally* Spec.⁵ The Examiner correctly interprets “deflection delta” as a value that is independent of the vertical position of either the tabletop or the “base” on which the tabletop rests. Ans. 6. Appellant presents neither evidence nor persuasive technical reasoning to contravene the Examiner’s determination in this regard.

⁵ In the absence of any teaching to the contrary, we assume that Appellant’s base 508 does not bend or deflect under the weight of the subject.

Appellant's argument based on the meaning of the word "predict," does not withstand scrutiny. Both Appellant's invention and Vaisburd calculate a "sag" or "deflection delta" based on a set of numerical values. If the calculation is not performed in real time, but is performed based on a set of hypothetical conditions that might occur in the future, such a calculation might be considered to be a "prediction." However, we tend to agree with the Examiner that Appellant's use of the terms "predict" and "prediction" appears to be anomalous in the context of the subject matter before us. Claim 1 requires a weight of a subject determined from an electrical signal from a vertical drive system. Claims App. Claim 1 bespeaks of a current, real time calculation, not a hypothetical future situation. Thus, Appellant's use of the term "predict/prediction" is essentially synonymous and can be used interchangeably with terms such as calculate, determine, compute, estimate, etc. Under the circumstances and the context in which the term "predict" appears, we discern no patentable distinction between Appellant's "predicted" deflection delta and Vaisburd's calculated "sag" value.

In view of the foregoing discussion, we determine the Examiner's findings of fact are supported by a preponderance of the evidence and that the Examiner's legal conclusion of unpatentability is well-founded. We sustain the Examiner's unpatentability rejection of claims 1-3, 5-9, 21, and 24.

*Unpatentability of Claims 22 and 25
Over Vaisburd, Aulbach, Nasuta, and Bruns*

Appellant does not argue for the separate patentability of these claims apart from arguments previously presented with respect to claim 1 that we determine to be unpersuasive. Appeal Br. 7. We sustain the Examiner's

unpatentability rejection of these claims for the same reasons previously expressed with respect to claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv) (failure to separately argue claims constitutes a waiver of arguments for separate patentability).

*Unpatentability of Claims 23 and 26
Over Vaisburd, Aulbach, Nasuta, Bruns,
Farooqui, NXT[®] Motor Internals, and Bernstein*

Appellant does not argue for the separate patentability of these claims apart from arguments previously presented with respect to claim 1 that we determine to be unpersuasive. Appeal Br. 7. We sustain the Examiner's unpatentability rejection of these claims. 37 C.F.R. § 41.37(c)(1)(iv).

CONCLUSION

Claims Rejected	§	Reference(s)/Bases	Aff'd	Rev'd
23, 26	112	Written Description		23, 26
1-3, 5-9, 21, 24	103	Vaisburd, Aulbach, Nasuta	1-3, 5-9, 21, 24	
22, 25	103	Vaisburd, Aulbach, Nasuta, Bruns	22, 25	
23, 26	103	Vaisburd, Aulbach, Nasuta, Bruns, Farooqui, NXT Motor Internals, Bernstein	23, 26	
Overall Outcome			1-3, 5-9 21-26	

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

AFFIRMED