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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte PAUL A. FURZE, MICHAEL J. TOUPIN, GLENN GRENIER, RICHARD DAPRATO, and STEVE TOBIN

Appeal 2018-000377
Application 14/557,688
Technology Center 2800

Before TERRY J. OWENS, LINDA M. GAUDETTE, and JANE E. INGLESE, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

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[1] This Decision includes citations to the following documents: Specification filed Dec. 2, 2014 ("Spec."); Final Office Action mailed July 18, 2017 ("Final Act."); Appeal Brief filed July 27, 2017 ("Appeal Br."); Examiner's Answer mailed Sept. 13, 2017 ("Ans."); and Reply Brief filed Oct. 11, 2017 ("Reply Br.").

Appellant[2] appeals under 35 U.S.C. § 134(a) from the Examiner's decision finally rejecting claims 1–12. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

The invention relates to a lightweight, portable robot for analyzing golf balls for short game performance attributes. Spec. ¶ 20. The preferred robot is said to be lightweight, portable, and able to hit a golf ball off of the ground, or a mat that simulates the ground, such that realistic short game performance can be evaluated. *Id.* Claims 1 and 10 are representative of the claims on appeal, and are reproduced below:

> 1. A portable golf hitting robot, comprising:
>
> a frame, a drive shaft coupled to the frame, a drive unit coupled to a first end of the drive shaft for supplying torque thereto and a golf club gripping member coupled to a distal end of the drive shaft, and
>
> the robot further comprising a one-way clutch juxtaposed between the drive unit and the golf club gripping member, wherein the torque applied from the drive unit to the golf club gripping member is at a ratio of less than 4-1.
>
> 10. A portable golf hitting robot system for swinging a golf club, comprising: a frame, a drive shaft coupled to the frame, a pneumatic rotary actuator coupled to a first end of the drive shaft for supplying power thereto and a golf club gripping member coupled to a distal end of the drive shaft for coupling the golf club to the robot, wherein the torque ratio from the pneumatic rotary actuator to the golf club gripping member is less than 2-1, and wherein the golf club is rotated in a pendulum

[2] The Applicant under 37 C.F.R. § 1.46, and, therefore, the Appellant under 35 U.S.C. § 134, is Acushnet Company, also identified by Appellant as the real party in interest. Appeal Br. 3.

> manner about the drive shaft axis which extends proximate a grip portion of the golf club.

Appeal Br. 13–14 (Claims Appendix).

The claims stand finally rejected as follows:

1. claims 1–12 under 35 U.S.C. § 112(a) as failing to comply with the enablement requirement;

2. claims 1–9 and 12 under 35 U.S.C. § 112(b) as indefinite; and

3. claims 10 and 11 under 35 U.S.C. § 103 as obvious over Parente (US 5,763,761, iss. June 9, 1998).

Rejection of claims 1–12 under 35 U.S.C. § 112(a) as failing to comply with the enablement requirement

The Examiner contends the claims fail to comply with the enablement requirement of 35 U.S.C. § 112(a) because the Specification does not explain how (1) "the same single rotating shaft [can] extend through the clutch from the drive unit to the gripping members" (the "drive shaft/clutch limitations," recited in claims 1 and 12), (2) the torque ratio can be anything other than 1-1 (the "torque ratio limitation," recited in claims 1 and 10); and (3) the club can move like a pendulum if it can rotate freely in only one direction (the "pendulum limitation," recited in claim 10). Final Act. 2–3.

For an enablement rejection, the PTO must "set[ ] forth a reasonable explanation as to why it believes that the scope of protection provided by that claim is not adequately enabled by the description of the invention." *In re Wright*, 999 F.2d 1557, 1561–62 (Fed. Cir. 1993). "[T]o be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without 'undue experimentation.'" *Id.* at 1561. Some experimentation, even a considerable

amount, is not "undue" if, e.g., it is merely routine, or if the specification provides a reasonable amount of guidance as to the direction in which the experimentation should proceed. *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988). The following factors are relevant in determining whether undue experimentation would have been required to make and use an invention: "(1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims." *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988). It is not necessary for an examiner to review all Wands factors, as long as it is evident that the examiner's analysis is at least reasonably based on some of the factors. *In re Hillis*, 484 Fed. App'x 491, 495 (Fed. Cir. 2012) (unpublished); *see also Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 1213 (Fed. Cir. 1991) ("[I]t is not necessary that a court review all the Wands factors to find a disclosure enabling. They are illustrative, not mandatory.").

(1) The drive shaft/clutch limitations (claims 1–9 and 12)

The Examiner contends independent claims 1 and 12 require a clutch positioned between a drive unit and a gripping member. Ans. 4. The Examiner finds the written description indicates the purpose of the clutch is to disconnect structurally separate drive shaft elements located on opposite sides of the clutch to enable independent rotation of the separate shaft elements. *Id.* at 2–4. The Examiner contends claims 1 and 12 require a structure in which opposite "ends of *the same shaft* ('a drive shaft')" are connected to the drive unit and the gripping member, respectively. *Id.* at 2.

The Examiner contends the written description does not enable one of ordinary skill in the art to make or use the claimed configuration, because it is unclear how the ends of the same drive shaft could rotate independently when employed with a clutch. *Id.* at 6.

Appellant argues the Examiner's rejection is based on an overly narrow interpretation of the claim term "a drive shaft" (claims 1, 12) as requiring a one-piece shaft. Appeal Br. 8; *see* Final Act. 2; Ans. 2. As noted by Appellant (Reply Br. 3), "an indefinite article 'a' or 'an' in patent parlance carries the meaning of 'one or more' in open-ended claims containing the transitional phrase 'comprising.'" *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008) (quoting *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356 (Fed. Cir. 2000)). "The exceptions to this rule are extremely limited: a patentee must evince a clear intent to limit 'a' or 'an' to 'one.'" *Id.* (internal quotation marks omitted). As observed by Appellant (Appeal Br. 10), the Examiner fails to read the claim language in light of the Specification as it would be interpreted by one of ordinary skill in the art. The Examiner has not identified, nor do we find, any disclosure in the Specification that indicates the inventors intended to limit the invention to a one-piece drive shaft. We are persuaded by Appellant's argument that the ordinary artisan would have understood from Figure 3 and the corresponding description thereof (*see, e.g.*, Spec. ¶ 22) that the drive shaft may have a two-piece construction. Reply Br. 3. Indeed, the Examiner appears to acknowledge that such two-piece construction is described in the Specification. *See* Ans. 2 ("Appellant's Figure 3 employs a clutch unit 126 positioned between the drive unit 124 and grip member 130, which clutch unit 126 is employed to literally disconnect the separate

rotating elements located on the opposite sides of the clutch. As the clutch disconnects those 2 separate elements, those 2 elements are independently rotatable because they are structurally separate.").

To the extent the Examiner's analysis of the drive shaft/clutch limitations took into account *Wands* factors other than the breadth of the claims (*Wands* factor (8)), that analysis is based on an erroneous interpretation of the claims as requiring a one-piece drive shaft. *See, e.g.*, Ans. 5 ("Appellant's claim calls for 'a shaft' whose shaft ends are connected to a drive unit and gripping member, and no such shaft is operational with a clutch."). Accordingly, the Examiner has not met the burden to show that the drive shaft/clutch limitations of claims 1–9 and 12 are not enabled by the Specification.

(2) The torque ratio limitations (claims 1–3 and 5–10)

The Examiner contends the Specification fails to describe gearing between the drive actuator and gripping members and, therefore, only a torque ratio of 1-1 is enabled. Final Act. 2. Appellant directs us to Specification paragraph 8 (Appeal Br. 8), which discloses that

> [t]he pneumatic rotary actuator preferably has sufficient torque to rotate the club head using less than a 4-1 torque ratio and preferably less than 2-1. Most preferably, the pneumatic rotary actuator is coupled to the golf club gripping member without any gear members such that the torque ratio from the actuator to the golf club gripping member is 1-1.

(Spec. ¶ 8). Appellant also directs us to Specification paragraph 4 which describes the known use of a gearbox, as described in Parente, to achieve torque ratios above 1-1. Appeal Br. 8; Spec. ¶ 4; Reply Br. 4 (citing Parente 16:9–16 (use of a 10:1 gearbox)); *see also* Reply Br. 3 ("[W]hen the claim states that a 'drive unit is coupled to a first end of the drive shaft for

supplying torque thereto' the claim contemplates the possibility of something linking the drive unit to the shaft such that torque can be transmitted to the shaft. It could be linked by a gearbox or clutch or both like in an automobile."). Appellant argues the ordinary artisan would understand from the disclosure in Specification paragraphs 4 and 8 that gearing can be used to adjust torque ratio to less than 4-1, although the most preferred embodiment does not use gears (a torque ratio of 1-1). Appeal Br. 8–9.

As noted above, although the Examiner need not review all Wands factors, the Examiner's analysis must be at least reasonably based on some of the factors. Appellant's argument persuasively shows that the Examiner failed to give sufficient consideration to the *Wands* factors in determining the torque ratio limitation is not enabled. By the Examiner's own admission, the rejection is based on the claim language alone, without consideration of the amount of direction or guidance in the Specification, the nature of the invention, the state of the prior art, the relative skill in the art, etc. *See, e.g.*, Final Act. 3 ("[C]laims 1 and 10 are read by themselves (and without consideration of the specification). . . . (NOTE: This rejection treats the two claims literally as they are and in its own way treats them as different embodiments from those illustrated in the figures. . . .)."

As explained by the predecessor to our reviewing court, "[i]n cases involving predictable factors, such as mechanical or electrical elements, a single embodiment provides broad enablement in the sense that, once imagined, other embodiments can be made without difficulty and their performance characteristics predicted by resort to known scientific laws." *In re Fisher*, 427 F.2d 833, 839 (CCPA 1970); *see also*, *In re Vaeck*, 947 F.2d

488, 496 (Fed. Cir. 1991) ("Where, as here, a claimed genus represents a diverse and relatively poorly understood group of microorganisms, the required level of disclosure will be greater than, for example, the disclosure of an invention involving a 'predictable' factor such as a mechanical or electrical element."). We are persuaded by Appellant's argument, as supported by citations to the Specification and prior art, that one of ordinary skill in the art would have been aware that gearing could be employed to achieve the desired torque, and would have possessed the requisite skills to add such gearing without undue experimentation. *See Penda Corp. v. U.S.*, 29 Fed. Cl. 533, 554 (Fed. Cl. 1993) ("The law does not require that the specification, let alone the claims, list every parameter of operation, so long as those of ordinary skill in the art realize that the parameter may be readily obtained.").

Accordingly, the Examiner has not met the burden to show that the torque ratio limitations of claims 1–3 and 5–10 are not enabled by the Specification.

(3) The pendulum limitation (claims 10 and 11)

The Examiner contends the claim 10 recitation requiring that the golf club have the capability of rotating in a pendulum manner is not enabled because "[a] one way clutch will permit the club to rotate freely in only one direction, but not in the opposite direction." Ans. 7; *see* Final Act. 2–3. Appellant argues that the meaning of "pendulum manner" is clear from Specification paragraph 7 and Figure 2. Appeal Br. 9. Specifically, Appellant contends the ordinary artisan would have understood that the drive shaft extends through or proximate to the golf club grip and the club

head rotates about the drive shaft in the same manner a pendulum swings about a point or an axis. *Id.*

Appellant's argument is persuasive for reasons similar to those discussed above in connection with the drive shaft/clutch and torque ratio limitations. Namely, the Examiner fails to consider the meaning of the claim term "pendulum manner" when read in light of the Specification. We agree with Appellant that the Specification clearly describes the arrangement of parts necessary to achieve rotation of a golf club in a "pendulum manner." *See, e.g.*, Spec. ¶ 12 ("Preferably, the golf club is not attached to the robot through a swing arm and/or swing wrist, but rather is coupled to a club gripping member that is rotated about the axis of a drive shaft. Thus, the robot is comprised of a frame, a drive shaft coupled to the frame, a drive unit coupled to a first end of the drive shaft for supplying power thereto and a golf club gripping member coupled to a distal end of the drive shaft such that the torque ratio is 1-1. The club is thus rotated in a pendulum manner about the drive shaft axis which extends proximate the golf club grip."). The Examiner is reminded that claims 10 and 11 are apparatus claims and require only that a robot is capable of rotating a golf club in a pendulum manner. *See* Reply Br. 3–4 ("[T]he only important part of the robot's function is to swing the club about the drive shaft axis in one direction so that the club face hits the ball." "In reality, the club . . . can be rotated back to reset the club to hit another ball.").

In sum, the Examiner has not met the burden to show that the pendulum limitation of claims 10 and 11 is not enabled by the Specification.

Rejection of claims 1–9 and 12 under 35 U.S.C. § 112(b) as indefinite

A claim is indefinite under 35 U.S.C. § 112 when it contains words or phrases whose meaning is unclear. *In re Packard*, 751 F.3d 1307, 1309 (Fed. Cir. 2014). "[C]laim definiteness depends on the skill level of an ordinary artisan. Therefore, the specification need only disclose adequate defining structure to render the bounds of the claim understandable to an ordinary artisan." *Telcordia Techs, Inc. v. Cisco Sys., Inc.* (Fed. Cir. 2010) (citing *Intel Corp. v. VIA Techs., Inc.*, 319 F.3d 1357, 1365–66 (Fed. Cir. 2003) (holding that the internal circuitry of an electronic device need not be disclosed in the specification if one of ordinary skill in the art would understand how to build and modify the device)).

The Examiner contends

> claims 1 and 12 . . . call for ends of the same shaft being connected to the gripping means and actuator, but also states that the clutch is between those same ends. That is confusing, as the clutch would in that case divide that single shaft into 2 shafts (one between the actuator and clutch, and the other between the clutch and gripping means).

Final Act. 4. As discussed above, the Examiner's interpretation of the claim term "a drive shaft" as requiring a one-piece shaft is overly narrow. One of ordinary skill in the art, when reading this term in light of the Specification, would construe the term "a drive shaft" as encompassing a two-part shaft. *See* Appeal Br. 10–11. Therefore, we are not persuaded that claims 1 and 12 are unclear, and do not sustain the indefiniteness rejection of 1–9 and 12.

Rejection of claims 10 and 11 under 35 U.S.C. § 103 as obvious over Parente

Claim 10 recites "a golf club gripping member coupled to a distal end of the drive shaft for coupling [a] golf club to the robot . . . wherein . . . the drive shaft axis . . . extends proximate a grip portion of the golf club." The Specification discloses that

> [p]referably, the golf club is not attached to the robot through a swing arm and/or swing wrist, but rather is coupled to a club gripping member that is rotated about the axis of a drive shaft. Thus, the robot is comprised of . . . a golf club gripping member coupled to a distal end of the drive shaft . . . . The club is thus rotated in a pendulum manner about the drive shaft axis which extends proximate the golf club grip.

Spec. ¶ 12. In the illustrated embodiments, golf gripping member 130 is attached directly to the end of drive shaft 122, such that when golf club 102 is secured to golf gripping member 130, drive shaft axis 128 extends through the grip portion of the golf club 102. *See* Spec., Figs 2–4. The Specification discloses that "[p]referably, the drive shaft axis 128 extends through or approximate to the golf club grip and the golf club 102 is rotated in a pendulum manner about the drive shaft axis 128. Most preferably, a portion of the golf club grip is located within 4 inches of the drive shaft axis 128." Spec. ¶ 23.

The Examiner cites column 1, lines 11–20 of Parente for a teaching of the above-quoted claim 10 limitation. Final Act. 5; Ans. 12. The cited disclosure reads, in relevant part, "[g]enerally, golf club swinging machines include a frame, an arm that is movably attached to the frame, and a drive mechanism for rotating the arm. A golf club is held at one end of the arm and the arm is swung to cause the club to hit a golf ball." Parente 1:16–20;

see also id. at 4:11–12 ("The typical contemplated use of the invention is as a surrogate for a swinging human arm . . . .").

We agree with Appellant (*see* Appeal Br. 12) that the Examiner has not explained adequately how Parente's disclosure amounts to a teaching or suggestion of "a golf club gripping member coupled to a distal end of the drive shaft for coupling [a] golf club to the robot . . . wherein . . . the drive shaft axis . . . extends proximate a grip portion of the golf club" (claim 10). More specifically, the Examiner has not explained how Parente's configuration, wherein the golf club gripping member is separated from the end of the drive shaft by an arm, enables attachment of a golf club so that the grip portion of the club is "proximate"—very close to, e.g., within 4 inches of (*see* above-cited disclosure in the Specification)—the drive shaft axis. Accordingly, we do not sustain this ground of rejection.

Order

Claims Rejected	**Basis**	**Reference(s)**	**Affirmed**	**Reversed**
1–12	§ 112(a), enablement			1–12
1–9, 12	§ 112(b), indefiniteness			1–9, 12
10, 11	§ 103	Parente		10, 11
Summary				1–12

REVERSED