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EXAMINER
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* CHETAN MITTAL and BALASUNDAR IYYAVU RAJU

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Appeal 2017-011394  
Application 13/879,045  
Technology Center 3700

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Before STEFAN STAICOVICI, CHARLES N. GREENHUT, and  
FREDERICK C. LANEY, *Administrative Patent Judges*.

STAICOVICI, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Chetan Mittal and Balasundar Iyyavu Raju (Appellants)<sup>1</sup> appeal under 35 U.S.C. § 134(a) from the Examiner’s decision in the Final Office Action (dated Oct. 11, 2016, hereinafter “Final Act.”) rejecting claims 1–12, 14, 18, and 21.<sup>2</sup>

We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

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<sup>1</sup> According to Appellants’ Appeal Brief (filed Apr. 6, 2017, hereinafter “Appeal Br.”), Koninklijke Philips NV is the real party in interest. Appeal Br. 1.

<sup>2</sup> Claims 13 and 15–17 are canceled. *See* Amendment After Final 5–6 (filed Dec. 9, 2016, hereinafter “Amendment”).

SUMMARY OF DECISION

We AFFIRM-IN-PART.

INVENTION

Appellants' invention relates "to the field of Doppler ultrasound based fetal monitoring." Spec. 1, ll. 2–3.

Claims 1, 14, and 21 are independent. Claim 1 is illustrative of the claimed invention and reads as follows:

1. A Doppler ultrasound device for monitoring a fetus in a subject and limiting ultrasound radiation to the fetus, the device comprising:
  - an ultrasound transducer;
  - a computer programmed to perform a fetus wellbeing assessment method including:
    - estimating an adequacy of acoustic coupling between the ultrasound transducer and the subject;
    - accumulating a time duration for which ultrasound is radiated into the subject starting when the estimate indicates adequacy of the acoustic coupling;
    - detecting a movement of the fetus based on reflected ultrasound radiation;
    - counting the number of detected fetal movements;
  - and
    - stopping the ultrasound radiation and disabling further ultrasound radiation for a predetermined time duration upon the occurrence of any of:
      - (1) the accumulated time duration equaling a reference time duration and the number of counted fetal movements equaling zero, and
      - (2) the accumulated time duration equaling the sum of the reference time duration and a predefined extended time duration; and
    - a user interface configured to convey information to the subject including at least a result of the fetus wellbeing assessment.

REJECTIONS<sup>3,4</sup>

- I. The Examiner rejects claims 1–3, 5–11, 14, 18, and 21 under 35 U.S.C. § 103(a) as being unpatentable over Nguyen (US 2007/0102501 A1, published May 10, 2007), Appellants’ Admitted Prior Art (hereinafter “AAPA”), MacDonald et al. (US 7,338,446 B2, issued Mar. 4, 2008, hereinafter “MacDonald”), Grossman et al. (WO 93/18710, published Sept. 30, 1993, hereinafter “Grossman”), O’Brien (GB 2 225 637 A, published June 6, 1990), and Baker (US 4,781,200, issued Nov. 1, 1988).
- II. The Examiner rejects claim 4 under 35 U.S.C. § 103(a) as being unpatentable over Nguyen, AAPA, MacDonald, Grossman, O’Brien, Baker, and Nishihara et al. (US 2008/0154155 A1, published June 26, 2008, hereinafter “Nishihara”).
- III. The Examiner rejects claim 12 under 35 U.S.C. § 103(a) as being unpatentable over Nguyen, AAPA, MacDonald, Grossman, O’Brien, Baker, and Bieniarz (US 6,045,500, issued Apr. 4, 2000).

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<sup>3</sup> The rejection of claim 3 under 35 U.S.C. § 112, second paragraph, as being indefinite has been withdrawn. *See* Final Act. 2; Advisory Action (dated Jan. 18, 2017, hereinafter “Adv. Act.”).

<sup>4</sup> Although claims 19 and 20 are included in the Office Action Summary of the Final Office Action, the Examiner does not include claims 19 and 20 in either the headings or the bodies of any of the rejections. *See* Final Act. 3–11. Accordingly, as the status of these claims is not clear, we do not address claims 19 and 20.

ANALYSIS

*Rejection I*

*Claim Construction*

Independent claim 1 recites, *inter alia*,  
stopping the ultrasound radiation . . . upon the occurrence of  
*any* of: (1) the accumulated time duration equaling a reference  
time duration and the number of counted fetal movements  
equaling zero, *and* (2) the accumulated time duration equaling  
the sum of the reference time duration and a predefined  
extended time duration.

Appeal Br. 20 (Claims App.) (emphasis added). The Examiner finds that  
“[c]laim 1 recites conditions (1) and (2) in the alternative,” whereas  
Appellants “assert that these conditions are not in the alternative.”  
Examiner’s Answer 7 (dated July 14, 2017, hereinafter “Ans.”); Appeal Br.  
13.

The use of the adjective “any” in conjunction with the term “and” in  
the limitation “any of: (1) . . . and (2)” links alternatives that occur under  
different conditions. *See e.g., Ortho-McNeil Pharm., Inc. v. Mylan Labs.,  
Inc.*, 520 F.3d 1358, 1361–1362 (Fed. Cir. 2008). Such an interpretation is  
consistent with Appellants’ Specification which describes condition (1) of  
claim 1 as occurring “where not a single movement of the fetus is recorded .  
. . . [and] the accumulated time duration has reached the reference time  
duration.” Spec. 4, ll. 22–25. In contrast, the Specification describes  
condition (2) of claim 1, as occurring when the number of fetal movements  
has not reached a reference number and the counting is continued for a  
predefined extended time duration. *Id.* Hence, because condition (1) is  
based on no fetal movements, whereas condition (2) requires a number of  
fetal movements, the use of the term “and” conjoins mutually exclusive

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conditions. *See Medgraph, Inc. v. Medtronic, Inc.*, 843 F.3d 942, 949 (Fed. Cir. 2016) (citation omitted) (“For example, in *Ortho--McNeil [Pharm., Inc. v. Mylan Labs., Inc.]*, 520 F.3d 1358, 1361–1362 (Fed. Cir. 2008)], we held that ‘and’ meant ‘or’ because as used in [the] claim, *and* conjoins mutually exclusive possibilities.”).

Accordingly, the use of the term “any” and Appellants’ Specification support a *disjunctive* construction for conditions (1) and (2) of claim 1, such that, like the Examiner, we interpret the term “and” in the above noted limitation to be used in a manner synonymous with “or.”

#### *Claims 1 and 14*

Appellants have not presented arguments for the patentability of claim 14 apart from claim 1. *See* Appeal Br. 8–13.<sup>5</sup> Therefore, in accordance with 37 C.F.R. § 41.37(c)(1)(iv), we select claim 1 as the representative claim to decide the appeal of the rejection of these claims, with claim 14 standing or falling with claim 1.

Appellants argue that none of the cited references discloses “the stopping criteria of claim 1 which achieves the twin goals of (1) limiting ultrasound dosage to a recommended maximum dosage and (2) complying with ALARA.” Appeal Br. 8; Spec. 1, ll. 9–11<sup>6</sup>. Appellants contend that “Grossman and O’Brien are cited as disclosing turning off the transducer *when a target is reached*, and MacDonald is cited as disclosing powering

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<sup>5</sup> “Independent claim 14 recites features similar to claim 1, and thus the above arguments apply similarly to claim 14.”

<sup>6</sup> “The principle behind safe exposure to any radiation, in the present case to ultrasound radiation, is known as ALARA —As Low As Reasonably Achievable.”

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down *when not in use* to save energy and wear and tear.” Appeal Br. 11. As to the disclosure of Baker, Appellants assert that although “Baker may arguably disclose condition (1), Baker does not disclose stopping the ultrasound radiation and disabling further ultrasound radiation for a predetermined time duration upon the occurrence of any of (1), and (2),” as called for by claim 1. *Id.*

We are not persuaded by Appellants’ arguments because we agree with the Examiner that “[c]laim 1 recites conditions (1) and (2) in the alternative” for the reasons discussed *supra*. Ans. 7. As such, we agree with the Examiner that the “twin benefits (1) and (2) (limiting dosage and complying with ALARA) are not required by the claims,” and, thus, “[i]t is immaterial if conditions (1) and (2) enforce ALARA because ALARA is not part of the claims.” *Id.* at 5–6. After all, limitations not appearing in the claims cannot be relied upon for patentability. *In re Self*, 671 F.2d 1344, 1348 (CCPA 1982).

We are further not persuaded by Appellants’ arguments regarding the disclosures of MacDonald, Grossman, O’Brien, and Baker (*see* Appeal Br. 9–11) because Appellants cannot show nonobviousness by attacking these references individually when the rejection as articulated by the Examiner is based on a combination of these references. *See In re Merck & Co. Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). In this case, the Examiner is correct in that AAPA discloses estimating adequacy of ultrasound coupling. Final Act. 4; *see also* Spec. 4, ll. 31–33. We further agree with the Examiner’s finding that Grossman discloses a fetal monitoring system in which “sampling is discontinued when a time period or count has reached a target.” Final Act. 5 (citing Grossman, pp. 14, 19). Further, the Examiner is correct that MacDonald discloses powering down an ultrasound device when not in use

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to “save energy and wear and tear of the ultrasound device.” *Id.* (citing MacDonald, col. 1; O’Brien, pp. 3, 4, 9, and 10). The Examiner is also correct in that Baker discloses an ultrasound fetal monitoring system, which conveys a recommendation to a user when the number of fetal movements is zero and an accumulated time duration is equal to a reference time duration. *See id.* at 6 (citing Baker, col. 19, ll. 25–35).

As such, the facts support the Examiner’s determination that modifying the system of Nguyen, to ensure proper ultrasound coupling, as per AAPA, and to stop the ultrasound radiation, as per MacDonald, once the reference time duration of Grossman is reached or Baker’s alarm is set-off when the number of fetal movements is zero and an accumulated time is equal to a reference time, would have been obvious to a skilled artisan. We agree with the Examiner’s reasoning for such a modification, namely, to (1) ensure proper functioning of the ultrasound device; (2) “provide a user with a safety alarm if insufficient kicks occur in a given period of time”; and (3) “save energy and wear and tear of the ultrasound device” once counting is completed or an alarm is set-off. Final Act. 4–6. As Appellants have not apprised us of error in the Examiner’s reasoning, we are not persuaded that the Examiner relied on impermissible hindsight, as Appellants urge, rather than the knowledge of those skilled in the art at the time of the invention. *See Appeal Br. 10.* The Examiner’s modification constitutes an improvement to Nguyen’s ultrasound device in the same manner as taught by AAPA, MacDonald, Grossman, and Baker to lead to a predictable result, and the modification is well within the skill of one having ordinary skill in this art. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007).

Furthermore, we appreciate Appellants’ concern that because MacDonald’s ultrasound device is powered down when not in use with a

patient, in MacDonald “the act of powering down . . . [the] ultrasound device does *not stop* ongoing ultrasound radiating into the subject.” Reply Brief 5, dated Sept. 7, 2017, hereinafter “Reply Br.”). However, obviousness does not require that all of the features of the secondary reference be bodily incorporated into the primary reference. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). Here, a skilled artisan would readily understand to stop the ultrasound device of Nguyen, as modified by AAPA, Baker, and Grossman, from radiating ultrasound energy into a patient when reaching a reference time duration and visual and audio alarms are set-off, in order to prevent wear and tear, as per MacDonald, as testing is finished when the alarms are set-off. Furthermore, as we attribute skill to the hypothetical person described in 35 U.S.C. § 103(a),<sup>7</sup> a skilled artisan would further understand to stop the ultrasound device from radiating ultrasound energy into a patient when visual and audio alarms are set-off because other medical personnel would then need to be contacted for help.<sup>8</sup>

Appellants further argue that the Examiner’s reliance on AAPA to show that methods for determining whether acoustic coupling is adequate are known is insufficient because it does not disclose “estimating *and* accumulating a time duration for which ultrasound is radiated into the subject *starting when the estimate indicates adequacy of acoustic coupling*,” as called for by claim 1. Appeal Br. 13 (citing Spec. 4, ll. 31–33). Rather, according to Appellants, AAPA “suggest[s] to the skilled artisan to perform

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<sup>7</sup> See *In re Sovish*, 769 F.2d 738, 742 (Fed. Cir. 1985).

<sup>8</sup> For example, in O’Brien the mother (user) “should ring the hospital” when “one or other of the measurements . . . [falls] outside the accepted ranges.” O’Brien, p. 10, ll. 2–6.

such an acoustic coupling as an equipment check prior to performing the fetal monitoring.” *Id.*

We are not persuaded by Appellants’ argument because an artisan must be presumed to know something about the art apart from what the references disclose. *See In re Jacoby*, 309 F.2d 513, 516 (CCPA 1962). Here, a person of ordinary skill in the art of medical ultrasound monitoring would have readily understood to start measuring time and detecting fetal movement only after establishing adequate ultrasound coupling because, otherwise, the results of the ultrasound test would be compromised and the test would have to be redone. We, thus, agree with the Examiner that “a skilled artisan would ensure [ultrasound] coupling at the start of accumulating time and detecting movement.” Ans. 8–9. Moreover, we note that Grossman specifically discloses that “the *start* of a recording session” occurs “[o]nce the patient *correctly* placed the Doppler transducer 100 on herself and a *consistent* fetal heart signal is detected.” Grossman, p. 14, ll. 6–10 (emphasis added). As a consistent fetal heart signal can be determined only when adequate ultrasound coupling has been established, Grossman discloses measuring time and detecting fetal movement after determining adequate ultrasound coupling.

In conclusion, for the foregoing reasons, we sustain the rejection of claim 1 under 35 U.S.C. § 103(a) as unpatentable over Nguyen, AAPA, MacDonald, Grossman, O’Brien, and Baker. Claim 14 falls with claim 1.

*Claims 2, 3, 5–11, and 18*

Appellants’ arguments with respect to the rejection of claims 2 and 11 rely on the arguments discussed *supra* that we did not find persuasive. *See* Appeal Br. 14.

As to the rejection of claims 3, 5–10, and 18 Appellants’ arguments recite additional claim limitations and baldly assert that these limitations are not taught or suggested by the applied references. *See id.* at 14–15. Such statements do not constitute separate arguments for patentability of the dependent claims. *See In re Lovin*, 652 F.3d 1349, 1357 (Fed. Cir. 2011). Appellants have waived any argument for separate patentability of these dependent claims. *See id.*

In conclusion, for the foregoing reasons, we likewise sustain the rejection of claims 2, 3, 5–11, and 18 over the combined teachings of Nguyen, AAPA, MacDonald, Grossman, O’Brien, and Baker.

*Claim 21*

In contrast to independent claim 1, independent claim 21 does not use the adjective “any” in conjunction with the term “and.” As such, we give the term “and” its customary and ordinary conjunctive meaning.

Therefore, claim 21 requires, *inter alia*, a computer readable medium having instructions for “stop[ing] the ultrasound radiation and disabl[ing] further ultrasound radiation” (1) “upon the occurrence of the number of counted fetal movements equaling a reference number,” (2) “upon the occurrence of the accumulated time duration equaling a reference time duration and the number of counted fetal movements equaling zero,” *and* (3) “upon the occurrence of the accumulated time duration equaling the sum of

the reference time duration and a predefined extended time duration.”

Appeal Br. 26. We, thus, agree with Appellants that in claim 21 “all three sets of instructions must be stored by the computer readable media.” Reply Br. 9.

With respect to option (3) stated above, the Examiner finds that O’Brien discloses that when insufficient ultrasound data has been collected in a time range, an additional amount of time is allocated to collect further data until the results are adequate or it is determined that a medical professional needs to be contacted. Final Act. 5–6 (citing O’Brien, pp. 3, 4, 9, and 10). Hence, according to the Examiner, O’Brien discloses option (3) of claim 21 in that “the [claimed] accumulated time duration is equal to the sum of the first reference time duration and the predefined extended time duration.” *Id.* at 5.

Appellants argue that “O’Brien’s recommendation does not appear to be based on any time duration equaling any reference time duration at all.” Appeal Br. 9; *see also* Reply Br. 7.

Although we appreciate the Examiner’s position that O’Brien’s system requires additional testing when ultrasound measurements are unsatisfactory, and such testing requires additional time, nonetheless, in O’Brien the additional ultrasound measurements are not performed for a “predefined extended time duration,”<sup>9</sup> but rather are performed until two fetal kicks are recorded, after which the recording is discontinued. *See* O’Brien, pp. 3–4. O’Brien specifically states that “[t]he mother records the heart rate until two foetal kicks have occurred . . . and the recording is then

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<sup>9</sup> An ordinary and customary meaning of the term “predefined” is “defined in advance.” *See* <https://www.merriam-webster.com/dictionary/predefined>.

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discontinued.” *Id.* at 4. In other words, O’Brien’s system does not allocate a “*predefined* extended time duration,” as recited in claim 21 (emphasis added), for performing additional ultrasound measurements. Rather, it performs ultrasound measurements until the number of fetal kicks equals two kicks and, hence, an indeterminate (not predefined) amount of time has passed. The Examiner’s use of the disclosures of Nguyen, AAPA, MacDonald, Grossman, and Baker does not remedy the deficiency of O’Brien described *supra*. See Final Act. 3–7.

Accordingly, because O’Brien fails to disclose the limitation of a “predefined extended time duration,” the combined teachings of Nguyen, AAPA, MacDonald, Grossman, O’Brien, and Baker fail to disclose an “accumulated time duration equaling the sum of the reference time duration and a predefined extended time duration,” as called for by claim 21. Therefore, we do not sustain the rejection of claim 21 under 35 U.S.C. § 103(a) as unpatentable over Nguyen, AAPA, MacDonald, Grossman, O’Brien, and Baker.

### *Rejections II and III*

Appellants’ arguments rely on the arguments discussed *supra* in the rejection of claim 1, from which claims 4 and 12 depend. See Appeal Br. 17–18.

Therefore, for the same reasons as discussed above, we also sustain the rejections under 35 U.S.C. § 103(a) of claim 4 as unpatentable over Nguyen, AAPA, MacDonald, Grossman, O’Brien, Baker, and Nishihara and of claim 12 as unpatentable over Nguyen, AAPA, MacDonald, Grossman, O’Brien, Baker, and Bieniarz.

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SUMMARY

The Examiner's decision to reject claims 1–12, 14, 18, and 21 under 35 U.S.C. § 103(a) is affirmed as to claims 1–12, 14, and 18 and reversed as to claim 21.

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-IN-PART