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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte YIFAN TANG

Appeal 2019-006854
Application 15/156,183
Technology Center 2800

Before ROMULO H. DELMENDO, MICHAEL P. COLAIANNI, and MICHAEL G. MCMANUS, *Administrative Patent Judges*.

DELMENDO, *Administrative Patent Judge*.

DECISION ON APPEAL

The Appellant[1] appeals under 35 U.S.C. § 134(a) from the Primary Examiner's decision to reject claims 21–40.[2] We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42—i.e., "ATIEVA, INC." (Application Data Sheet filed May 16, 2016 at 4), which is also identified as the real party in interest (Appeal Brief filed February 11, 2019 ("Appeal Br.") at 1).

[2] *See* Appeal Br. 5–16; Non-Final Office Action entered September 11, 2018 ("Non-Final Act.") at 2–9; Examiner's Answer entered June 28, 2019 ("Ans.") at 3–10.

I. BACKGROUND

The subject matter on appeal relates to an induction motor controller and to a method for producing alternating current (AC) power for an induction motor (Specification filed May 16, 2016 ("Spec.") ¶¶ 4–6). Representative claim 21 is reproduced from the Claims Appendix to the Appeal Brief, as follows:

> 21. An induction motor controller, comprising:
>
> a DC (direct current) to AC (alternating current) inverter configured to produce AC power for an induction motor from switching signals and DC power;
>
> a space vector modulator configured to produce the switching signals, based on a commanded stator voltage vector in a phase voltage reference frame;
>
> a flux and torque estimator configured to produce at least a rotor flux, in a rotor flux feedback loop, and a torque in a torque feedback loop, based on outputs of the space vector modulator and the DC to AC inverter;
>
> a DQ to XY vector rotator configured to produce the commanded stator voltage vector in the phase voltage reference frame, based on a commanded stator voltage vector in a stator flux reference frame; and
>
> a torque regulator and flux regulator, configured to produce the commanded stator voltage vector in the stator flux reference frame, based on the rotor flux in the rotor flux feedback loop and the torque in the torque feedback loop.

(Appeal Br. 17).

II. REJECTION ON APPEAL

Claims 21–40 stand rejected under AIA 35 U.S.C. § 102(a)(1) as anticipated by Bhangu et al.[3] ("Bhangu") (Ans. 3–10; Non-Final Act. 2–9).

[3] US 2014/0203754 A1, published July 24, 2014.

III. DISCUSSION

The Appellant relies on the same or similar arguments for all claims on appeal, focusing only on independent claims 21, 28, and 35 (Appeal Br. 5–16). Absent any arguments that claims 21, 28, and 35 are separately patentable from one another, we decide this appeal on the basis of claim 21, which we designate as representative. 37 C.F.R. § 41.37(c)(1)(iv). By this rule, claims 22–40 stand or fall with claim 21.

The Examiner finds that Bhangu describes every limitation recited in claim 21 within the meaning of 35 U.S.C. § 102(a)(1) (Non-Final Act. 2–3). In support, the Examiner relies primarily on Bhangu's Figures 1, 5, and 8 and descriptions related thereto (*id.*).

The Appellant provides a number of arguments in support of reversal (Appeal Br. 5–16), but for the reasons stated in the Answer (Ans. 3–10) and below, we do not find any of them sufficient to identify reversible error in the Examiner's rejection. *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011).

First, the Appellant contends that Bhangu's Figure 5 does not disclose an induction motor controller because Bhangu's permanent magnet motor has been mischaracterized as an induction motor controller (Appeal Br. 5). According to the Appellant, "[a] person of ordinary skill in the art would know that induction motors and permanent magnet motors differ" (*id.* at 5–6).

As the Examiner finds (Ans. 4–5), Bhangu discloses that "[a]s is known in the art, permanent magnet synchronous machines can be classified according to the location of the one or more permanent magnets included in the rotor" and that a preferred example of such a machine is an interior permanent magnet synchronous machine ("IPMSM") (Bhangu ¶ 92).

Bhangu discloses a controller and method for controlling an IPMSM (e.g., *id.* ¶ 176; Fig. 5). According to Bhangu, "the method may be applied to a wide variety of AC machines, i.e. such that the AC machine could be any one of an *induction machine*, a synchronous machine, a synchronous reluctance machine, a switch reluctance machine, a brushless synchronous machine" (*id.* ¶ 93 (emphasis added)). Because an induction machine is one of only a few enumerated machine classes (*see, e.g.*, *In re Petering*, 301 F.2d 676, 681 (CCPA 1962)), Bhangu's disclosure directly refutes the Appellant's unsubstantiated argument that "a person of ordinary skill in the art would know that induction motors and permanent magnet motors differ" (Appeal Br. 5–6). *Cf. In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997).

Second, the Appellant argues that "[t]he Examiner has erred by citing elements of differing machines in differing drawings, with no evidence that these cited elements are all in the same machine or could be combined into one machine" (Appeal Br. 6). According to the Appellant, "[t]here is no disclosure in Bhangu that the space vector modulator 106 in Fig. 1, flux and torque estimator 414 in Fig. 5, and PI flux regulator 642 and PI torque regulator 644 in Fig. 8 belong together in one controller with one control scheme" (*id.* at 7).

We disagree. Our reviewing court has stated that, to anticipate, "'[t]he [prior art] reference must clearly and unequivocally disclose the claimed [invention] or direct those skilled in the art to the [invention] without *any* need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference.'" *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008) (quoting *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972) (plurality)).

Bhangu states that Figure 1 "is a schematic diagram showing an apparatus including a controller for controlling a permanent magnet synchronous machine according to a field oriented control scheme in a 2D rotating reference frame *using conventional field weakening techniques*" (Bhangu ¶ 133 (emphasis added)). But, with respect to Figures 5 and 8, Bhangu teaches that both figures are directed to a controller for controlling an IPMSM according to a direct torque and flux control scheme (*id.* ¶¶ 138, 141, 176, 205, 214). Therefore, Bhangu's teachings regarding Figures 5 and 8 are disclosures that are "directly related to each other" and thus may be considered together in an anticipation rejection. As Bhangu's Figures 5 and 8 appear to include all the limitations required by claim 21—e.g., a space vector modulator **606**, an observer **662** that estimates flux linkage of the stator and torque, and proportional-integral (PI) flux and torque regulators **642**, **644** as shown in Figure 8 (*id.* ¶¶ 208, 213–214, 217), we do not find the Appellant's argument sufficient to identify reversible error in the rejection.

Third, the Appellant argues that "[t]he Examiner has . . . mischaracterized a flux linkage of the stator as a rotor flux" because a "[r]otor flux is not the same as flux linkage of the stator" (Appeal Br. 8 (citing Spec. ¶ 2)). The Examiner, on the other hand, provides a detailed response, which we find to be reasonable (Ans. 8–9). The Appellant does not explain persuasively how and why the cited portion of the current Specification supports the Appellant's argument and does not rebut (e.g., by way of a reply brief) the findings made in the Examiner's response to the Appellant's argument. Therefore, the Appellant's argument is ineffective to identify reversible error.

Fourth, the Appellant argues that Bhangu's Figure 5 has not been shown to include a space vector modulator and that the flux and torque estimator **414** shown therein has not been shown to have inputs that are outputs of such a space vector modulator (Appeal Br. 9). The Appellant argues further that Bhangu's switching table **412** in Figure 5 has not been shown to be a space vector modulator (*id.*).

The Appellant's arguments are unpersuasive. Consistent with the Examiner's position (Ans. 9), Bhangu's Figure 5 shows that the flux and torque estimator **414** produces flux feedback and torque feedback to the switching table **412**, which, as in Figure 8's space vector modulator **606**, appears to provide switching signals to an inverter **404** (Bhangu ¶ 209; Figs. 5 and 8). Therefore, we do not find the Appellant's arguments persuasive to identify reversible error.

Fifth, the Appellant argues that "the PI flux regulator **642** and PI torque regulator **644** in Bhangu['s] Fig. 8 are not shown to produce output based on rotor flux, and there is no rotor flux feedback loop in Bhangu" (Appeal Br. 10 (some bolding removed)). Again, the Appellant contends that "[t]he Examiner has erred by mischaracterizing a reference flux linkage of the stator as a rotor flux" (*id.*).

We do not find the Appellant's argument persuasive. In addition to the Examiner's reasoning (Ans. 10), Bhangu's Figure 8 shows that the observer (estimator) **662** uses inputs from the outputs of the space vector modulator **606**, inverter **604**, and converter **664** to observe flux linkage of the stator and torque values to allow PI flux and PI torque regulators **642**, **644** to produce reference voltages (Bhangu ¶¶ 214, 217).

For these reasons, and those well-stated in the Answer and Non-Final Action, we uphold the Examiner's rejection.

IV. CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
21–40	102(a)(1)	Bhangu	21–40	

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

AFFIRMED