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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JERRY C. BURCH, JAMES W. MORAN, and ALLEN ABEL

Appeal 2019-004846
Application 15/139,393
Technology Center 2800

Before JULIA HEANEY, DEBRA L. DENNETT, and LILAN REN, *Administrative Patent Judges*.

DENNETT, *Administrative Patent Judge.*

DECISION ON APPEAL[1]

Pursuant to 35 U.S.C. § 134(a), Appellant[2] appeals from the Examiner's decision to reject claims 1–5, 7–17, and 19–26 of Application 15/139,393. We have jurisdiction under 35 U.S.C. § 6(b).

For the reasons set forth below, we REVERSE.

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[1] In our Decision, we refer to the Specification ("Spec.") of Application No. 15/139,393 filed Apr. 27, 2016 ("'393 App."); the Final Office Action dated Sept. 21, 2018 ("Final Act."); the Advisory Action dated Nov. 30, 2018 ("Advisory Act."); the Appeal Brief filed Feb. 19, 2019 ("Appeal Br."); the Examiner's Answer dated Apr. 1, 2019 ("Ans."); and the Reply Brief filed May 31, 2019 ("Reply Br.").

[2] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Globe Motors, Inc. Appeal Br. 3.

STATEMENT OF THE CASE

The ’393 Application relates to a wound stator for a dynamo-electric machine. Spec. 1, ll. 26–27. The invention electrically isolates the windings from the stator core through complete phase-to-phase isolation between windings or turn-to-turn isolation between adjacent turns forming the windings. Spec. 6, ll. 22–25.

The stator core of the wound stator is an integral preformed structure comprising a unitary cylindrical yoke and having a plurality of radially inward extending stator teeth formed integrally with the yoke. Spec. 6, ll. 27–29. The stator teeth are spaced circumferentially and define circumferentially distributed stator slots. Spec. 6, l. 29–7, l. 1. The stator windings are formed around the stator teeth and into the slots. Spec. 7, ll. 1–2. Isolation between windings is accomplished without adding insulation on the wire or otherwise altering the structure of the wire to increase insulating properties of the wire. Spec. 7, ll. 2–4.

Fig. 1 of the ’393 Application is reproduced below:

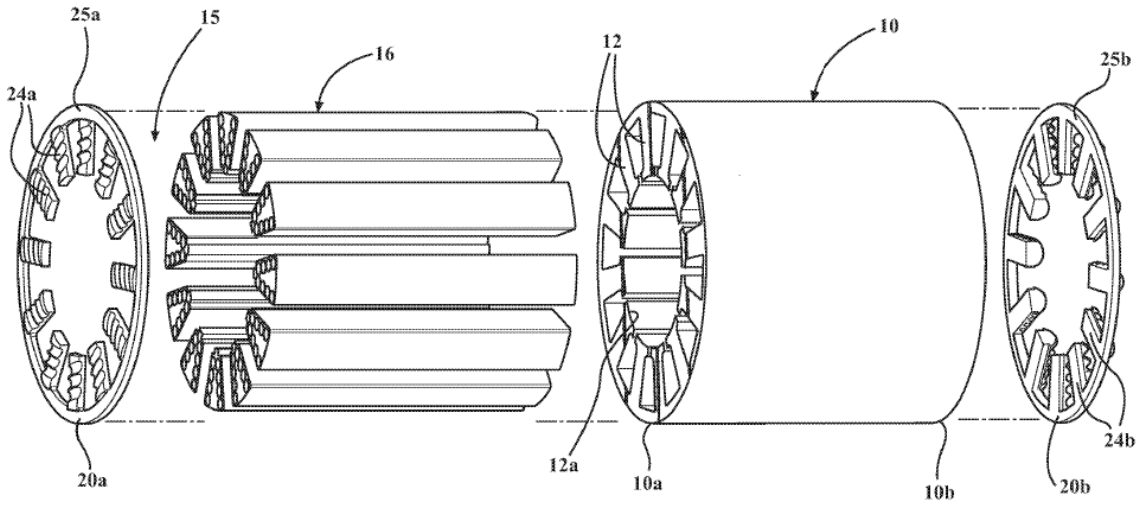


FIG. 1

Fig. 1 is an exploded perspective view of a stator core (10), insert members (16), and top (20a) and bottom (20b) end laminae in accordance with the invention. Spec. 5, ll. 11–12; 12, ll. 4–6. Stator core (10) comprises a unitary cylindrical yoke forming an outer peripheral wall structure and a plurality of radially inward extending stator teeth (12) defining axially extending stator slots therebetween. Spec. 7, ll. 14–17.

An insulation system is mounted to stator core (10). The insulation system includes insulating structure (15) adapted to extend into stator slots and top and bottom laminae. Spec. 7, ll. 20–24. Insulating structure (15) is formed by insert members (16) that further function as wire guides to facilitate placement of wire in stator slots. Spec. 7, ll. 24–26.

The ’393 Application’s FIG. 4A is reproduced below:

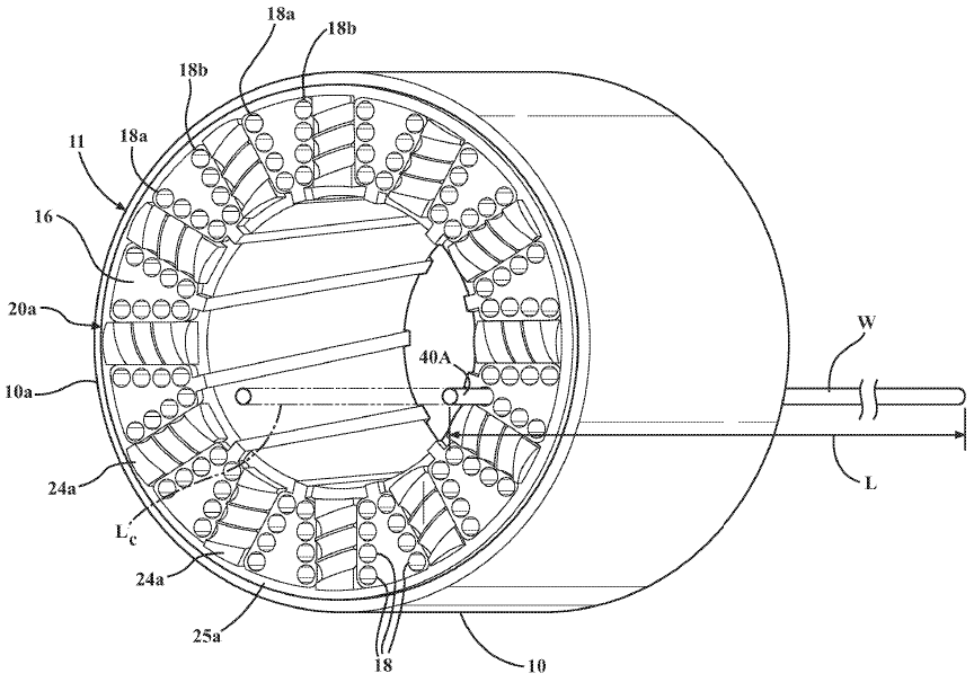


FIG. 4A

FIG. 4A is a perspective end view of a stator assembly comprising insert members (16) inserted into stator slots and including a top end lamina

positioned on the end of the stator. Spec. 5, ll. 16–18. Insert members (16) completely fill a stator slot and may form a predefined axial path through stator core (10) for each of the wire passes through a stator slot during formation of turns forming a wire winding on stator core (10). Spec. 8, ll. 4–7.

Claim 1, reproduced below from Claims Appendix A of the Appeal Brief, illustrates the claimed subject matter:

> 1. A wound stator for a dynamo-electric machine comprising:
>
> a stator stack comprising a unitary cylindrical yoke and a plurality of circumferentially spaced, radially inward extending stator teeth defining stator slots therebetween;
>
> a winding formed by a continuous strand of wire of a predetermined gauge forming a plurality of turns around each stator tooth and defined by wire passes extending through the slots and connected by bent portions of the continuous strand of wire forming end turns, each winding including a first lead end extending from a stator slot on a first side of a respective stator tooth and a second lead end extending from a stator slot on a second side of the respective stator tooth; and
>
> an insulation system including an insulating structure extending through each stator slot between windings located on two adjacent stator teeth, the turns of each winding located between a respective stator tooth and a first surface of the insulating structure engaged with the winding.

REFERENCES

The Examiner relies on the following references in rejecting the claims:

Name	Reference	Date
Harada et al. ("Harada")	US 2009/0096313 A1	Apr. 16, 2009
Rhoads	US 2011/0095641 A1	Apr. 28, 2011
Stark et al. ("Stark")	US 2011/0115317 A1	May 19, 2011
Takahashi	US 2014/0292119 A1	Oct. 2, 2014

REJECTIONS

The Examiner maintains the following rejections under 35 U.S.C. § 103: (1) claims 1, 2, 7, 10, 12, 14–17, 21, and 24–26 over Harada in view of Takahashi; (2) claims 3–5, 8, 9, 11, 22, and 23 over Harada and Takahashi, and further in view of Rhoads; and (3) claims 13, 19, and 20 over Harada and Takahashi, and further in view of Stark. Final Act. 4–17.

DISCUSSION

We review the appealed rejections for error based upon the issues identified by Appellant and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential), (cited with approval in *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011)) ("[I]t has long been the Board's practice to require an applicant to identify the alleged error in the [E]xaminer's rejections."). After considering the evidence presented in this Appeal and each of Appellant's arguments, we are persuaded that Appellant identifies reversible error in the Examiner's rejections.

The Examiner rejects all of the claims as obvious over at least Harada in view of Takahashi. Final Act. 4–17.

Appellant argues for patentability of claims 2–5, 7–17, and 19–26 "for the same reasons as discussed" regarding claim 1. Appeal Br. 11–13 (independent claims 14 and 24 patentable "for the same reasons as discussed

with regard to independent claim 1" and dependent claims patentable based on their dependence from patentable claims). Independent claims 1 and 14 recite "a continuous strand of wire of a predetermined gauge forming a plurality of turns around each stator tooth and defined by wire passes extending through the slots and connected by bent portions of the continuous strand of wire forming end turns." Appeal Br. 14–16. Similarly, independent claim 24 recites "at least one continuous strand of wire of a predetermined gauge forming a winding having a plurality of turns defined by wire passes extending through the slots on either side of a stator tooth and connected by bent portions of the continuous strand of wire forming end turns." *Id.* at 17.

We select independent claim 1 as representative of the claims subject to the first ground of rejection. 37 C.F.R. § 42.37(c)(1)(iv). We also consider these arguments to the extent applicable to the claims subject to the remaining grounds of rejection.

With regard to claim 1, the Examiner finds that Harada teaches most of the limitations, but does not teach a "winding formed by a continuous strand of wire defined by wire passes extending through the slots and connected by bent portions of the continuous strand of wire forming end turns." Final Act. 5. However, the Examiner finds that Takahashi discloses this limitation. *Id.* The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention to form the winding of Harada from a continuous strand of wire, as taught by Takahashi, in order to reduce the axial height of the end turns thereby reducing the overall size of the motor. *Id.* (citing Takahashi ¶ 74).

In the Answer the Examiner explains that Harada is cited as teaching a winding formed by a strand of wire of a predetermined gauge forming a

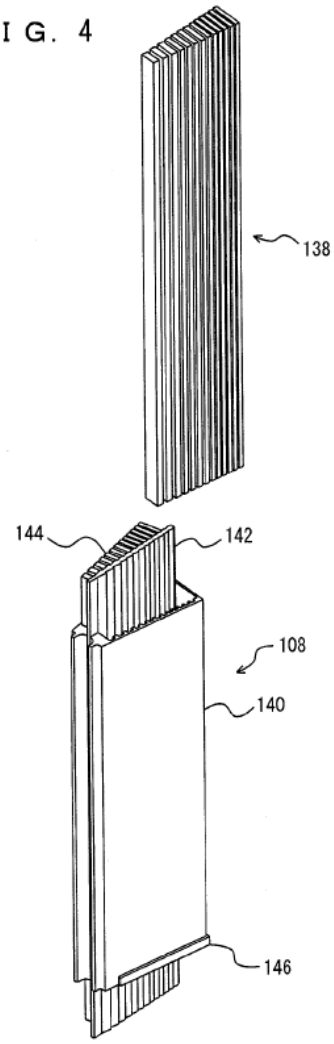
plurality of turns around each stator tooth. Ans. 4. The Examiner states that Takahashi was not cited for disclosing the coil-type windings implied by the "continuous strand of wire forming a plurality of turns around a stator tooth" limitation. *Id.* at 3–4.

Appellant argues that neither Harada nor Takahashi discloses "a continuous strand of wire forming a plurality of turns around each stator tooth." Appeal Br. 9. Appellant argues that Takahashi instead discloses a plurality of conductor wires wound about a stator core in wave winding. *Id.* at 8 (citing Takahashi ¶ 65 and Figs. 9–11); Reply Br. 8. Appellant contends that Takahashi teaches *different* conductor wires are located side-by-side in each slot, rather than a continuous strand of wire forming a plurality of turns around a stator tooth. Appeal Br. 9; Reply Br. 9.

Appellant identifies reversible error in the rejection of claim 1 over Harada in view of Takahashi.

The Examiner states that element 108 of Harada is a winding formed by a strand of wire forming a plurality of turns around each stator tooth. Ans. 4. Harada Fig. 4 is reproduced below:

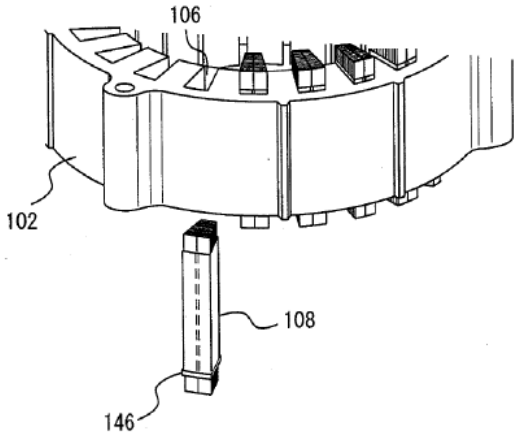
FIG. 4



Harada Fig. 4 is a view showing a step of fabricating a coil plate laminated body. Harada ¶ 40. A coil plate laminated body is formed by plurality of coil plates (138) inserted into resin insulator (140) in a longitudinal direction of resin insulator (140) to fabricate coil sub-assembly (108). Insulating plate (142) is formed at a center portion of resin insulator (140). Harada ¶ 79.

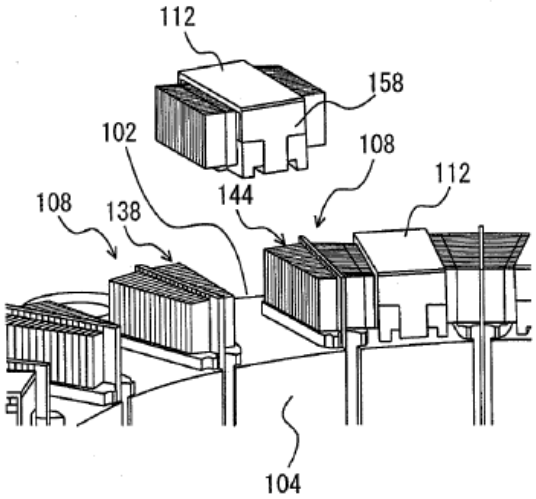
As shown in Harada Fig. 7, *infra*, coil sub-assembly (108) is inserted into a slot between two teeth in a stator core.

FIG. 7



Harada Fig. 7 is a view showing a step of incorporating coil sub-assembly (108) into slot (106) in stator core (102). Harada ¶¶ 43, 88. Upper and lower transition member laminated bodies (110 and 112) are then inserted between two coil subassemblies (108), as shown in Harada Fig. 9:

FIG. 9



Harada Fig. 9 is a view showing a step of inserting a transition member laminated body (112) between two coil sub-assemblies ((108) in a stator core. Harada ¶¶ 45, 92. Transition member laminated body (112) is incorporated into the upper portion of tooth (104) and transition member laminated body (110, not shown) is incorporated into the lower portion of

tooth (104) so as to connect between coil plate laminated bodies (138 and 144) inserted into the sides of tooth (104). Harada ¶ 92.

We do not agree with the Examiner's finding that element (108) of Harada is a winding formed by a strand of wire forming a plurality of turns around each stator tooth. *See* Ans. 4. Harada's coil sub-assembly (108) is made up of straight coil plates (138) that extend out of the top and through the bottom of stator core (102), and do not form any turns around a stator tooth. *See* Harada Fig. 7; *see also* Reply Br. 2–3. At most, Harada teaches insertion of straight coil plates (138 and 144) into the stator core, that assembly of separate, straight upper and lower transition member laminated bodies (110 and 112) at the ends of the stator core. Thus, contrary to the Examiner's finding, Harada does not disclose "a winding formed by a strand of wire of a predetermined gauge forming a plurality of turns around each stator tooth and defined by wire passes extending through the slots and end turns, each winding including a first lead end extending from a stator slot on a first side of a respective stator tooth and a second lead end extending from a stator slot on a second side of the respective stator tooth." *See* Final Act. 5.

Takahashi, cited only for reciting "a continuous stand of wire" (*see* Ans. 3–4), does not rectify the lack of teaching in Harada of "a plurality of turns around each stator tooth." *See* Takahashi Fig. 10, ¶ 65. Takahashi's disclosure of "wave winding" shows that the continuous strand of wire is woven over one stator tooth, then under the next, and so on. *Id.* Fig. 10.

We also agree with Appellant that one of ordinary skill in the art at the time of the invention would not have combined the teachings of Harada and Takahshi to achieve the claimed device. *See* Appeal Br. 9–11. The Examiner fails to explain how the skilled artisan could have employed

Takahashi's continuous wave winding in the Harada's structure, which requires assembly of multiple different preformed pieces, not a continuous piece. *See* Reply Br. 3.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 2, 7, 10, 12, 14–17, 21, 24–26	103	Harada, Takahashi		1, 2, 7, 10, 12, 14–17, 21, 24–26
3–5, 8, 9, 11, 22, 23	103	Harada, Takahashi, Rhoads		3–5, 8, 9, 11, 22, 23
13, 19, 20	103	Harada, Takahashi, Stark		13, 19, 20
Overall Outcome				1–5, 7–17, 19–26

REVERSED