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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/907,868	01/27/2016	Seiji Okabe	GMP-15-1593	8414
35811	7590	09/27/2019	EXAMINER	
IP GROUP OF DLA PIPER LLP (US) ONE LIBERTY PLACE 1650 MARKET ST, SUITE 5000 PHILADELPHIA, PA 19103			WYSZOMIERSKI, GEORGE P	
			ART UNIT	PAPER NUMBER
			1733	
			NOTIFICATION DATE	DELIVERY MODE
			09/27/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SEIJI OKABE, NOBUO SHIGA, and TAKESHI IMAMURA

Appeal 2019-001942
Application 14/907,868
Technology Center 1700

Before BEVERLY A. FRANKLIN, LINDA M. GAUDETTE, and
CHRISTOPHER L. OGDEN, *Administrative Patent Judges*.

OGDEN, *Administrative Patent Judge*.

DECISION ON APPEAL¹

Appellant² appeals under 35 U.S.C. § 134(a) from the Examiner's
decision rejecting claims 5–12. We reverse.

¹ The appeal record includes the following: Specification, Jan. 27, 2016 (“Spec.”); Final Office Action, Apr. 10, 2018 (“Final Action”); Appeal Brief, Aug. 28, 2018 (“Appeal Br.”); Examiner’s Answer, Nov. 9, 2018 (“Answer”), and Reply Brief, Jan. 2, 2019 (“Reply Br.”)

² Appellant is JFE Steel Corporation, which is the “applicant” as defined in 37 C.F.R. § 1.42. Appellant also identifies this entity as the real party in interest. Appeal Br. 1.

BACKGROUND

Appellant's claimed invention "relates to an iron-based amorphous alloy thin strip suitable for use in a core material of a wound iron-core transformer." Spec. ¶ 1. According to the Specification, during casting of such alloy strips, gas pockets tend to form between the molten alloy and the cooling roll, and form recesses in the metal strip. *Id.* ¶ 17. These recesses correlate with an adverse property of transformer materials called "iron loss" or "core loss." *See id.* ¶ 17; Matsuki 5:66–6:2. Although surface roughness (Ra) is one way to characterize the extent of these recesses, the Specification teaches that the following measures are more meaningful: (1) the number of recesses per unit area, and (2) the length of the recesses in the circumferential direction of the roll. *See* Spec. ¶ 18.

Independent claim 5, which we reproduce below, is representative of the invention:

5. An iron-based amorphous alloy thin strip having a chemical composition represented by a chemical formula of $Fe_xB_ySi_z$ (wherein x is 78–83 at%, y is 11–15 at% and z is 6–13 at%), *wherein a number of recesses on a surface that contacted a cooling roll during formation of the thin strip is not more than 8 pockets/mm² and an average length of the recesses in a circumferential direction of the roll is not more than 0.5 mm.*

Appeal Br. 7 (emphasis added). Claims 6–12 depend directly or indirectly from claim 5. *Id.*

The Examiner rejects claims 5–8 under 35 U.S.C. § 103 as being unpatentable over Matsuki.³ Final Action 2–3. The Examiner rejects claims

³ Matsuki et al., US 6,273,967 B1 (issued Aug. 14, 2001) ("Matsuki").

9–12 as being unpatentable over Matsuki in view of Kogiku.⁴ Final Action 3–4.

DISCUSSION

According to the Examiner, Matsuki discloses an alloy strip with the composition recited in claim 5, but “does not specify any particular limitations on the number and length of ‘recesses’ on the surface of such a strip.” Final Action 3. However, the Examiner finds that Matsuki “discusse[s] the importance of a low surface roughness in the prior art materials.” *Id.* The Examiner finds that “a material with a low surface roughness (e.g. that of Matsuki) would have little deviation [from flatness] and therefore a small amount of recesses on its surface, in accord with the claims.” *Id.*

In the Answer, the Examiner provides an additional inherency rationale, that “strong similarities exist between the methods employed by Matsuki and the present inventors in making their respective materials.” Answer 5. For example, the Examiner points to similarities in the thickness of the strip, the rotating speed of the drum, and the CO₂-enriched atmosphere. *Id.* The Examiner reasons that, because Matsuki’s manufacturing process is “substantially the same as that employed by Appellant in making the presently claimed materials[, i]t is eminently fair and reasonable to suggest that the resultant properties in those materials (such as [the] number and size of recesses) would likewise be the same or nearly so in both instances.” *Id.*

⁴ Kogiku et al., US 5,658,397 (issued Aug. 19, 1997) (“Kogiku”).

Appellant argues that “[s]urface roughness as described in Matsuki is not a proxy for the claimed number and size of recesses.” Appeal Br. 3. In particular, Appellant argues that the number of recesses and the “average length of the recesses” are two independent concepts, and that they differ from surface roughness. Reply Br. 1. For example, Appellant points to Table 1 of the Specification, showing that under certain conditions equivalent to Matsuki’s high-CO₂ environment, the number of recesses can be low (5 mm⁻²), but their average length can be high (0.8 mm) and outside the scope of claim 5. *Id.* at 1 (citing Spec. 12, Table 1).

Appellant also argues that by following Matsuki’s method, a person of ordinary skill in the art would not necessarily achieve an alloy strip in which recesses have the recited average length. Reply Br. 2. For example, Appellant argues that Table 1 of the Specification shows that properties of the cooling roll (i.e., surface roughness and surface temperature) affect the length of the recesses. *Id.*

We agree with Appellant that the evidence of record does not show that Matsuki’s process inherently produces an alloy strip in which the average recess length in the circumferential direction of the roll is 0.5 mm or less. “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.’” *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (citing *Continental Can Co v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991)). Here, Table 1 of the Specification suggests that even in a process similar to that of Matsuki, which produces a low number of recesses per square

millimeter and thus likely a low surface roughness, the average length of those recesses may be outside the scope of claim 5.

Thus, the Examiner has not shown, by a preponderance of the evidence, that Matsuki's process would necessarily produce an alloy strip falling within the scope of claim 5. Because claims 6–12 depend from claim 5, and the Examiner's other findings do not cure this deficiency, we reverse the Examiner's decision as to all claims.

CONCLUSION

In summary,

Claims Rejected	Basis	Affirmed	Reversed
5–8	§ 103 Matsuki		5–8
9–12	§ 103 Matsuki, Kogiku		9–12
Overall Outcome			5–12

REVERSED