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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte HIROTAKA INOUE, SHIGEHIRO TAKAJO,
HIROI YAMAGUCHI, SEIJI OKABE,
and KAZUHIRO HANAZAWA

Appeal 2018-003605
Application 14/369,237
Technology Center 1700

Before TERRY J. OWENS, JAMES C. HOUSEL, and
MERRELL C. CASHION, JR., *Administrative Patent Judges*.

CASHION, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF CASE

This is an appeal under 35 U.S.C. § 134(a) from the final rejection of claims 10–14. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

Claims 10 and 14 illustrate the subject matter of Appellant's¹ invention and are reproduced below:

10. A grain-oriented electrical steel sheet, linear strain having been applied thereto by irradiation with a high-energy beam, the linear strain extending in a direction that intersects a rolling direction of the steel sheet, wherein

an area ratio of an irradiation mark within an irradiation region of the high-energy beam is 2 % or more and 20 % or less, an area ratio of a protrusion with a height of 1.5 μm or more within a surrounding portion of the irradiation mark is 60 % or less, and an area ratio of an exposed portion of steel substrate in the irradiation mark is 90 % or less.

14. A grain-oriented electrical steel sheet, linear strain having been applied thereto by irradiation with a high-energy beam, the linear strain extending in a direction that intersects a rolling direction of the steel sheet, wherein

an area ratio of an irradiation mark within an irradiation region of the high-energy beam exceeds 20 %, an area ratio of a protrusion with a height of 1.5 μm or more within a surrounding portion of the irradiation mark is 60 % or less, an area ratio of an exposed portion of steel substrate in the irradiation mark is 30 % or more and 90 % or less, and an insulating coating is formed after the irradiation with the high-energy beam.

Appellant requests review of the Examiner's decision to finally reject claims 10–14 under 35 U.S.C. § 103(a) as unpatentable over Yamaguchi (JP 59-229419 A, published December 22, 1984, and relying on an English Abstract dated March 13, 2017). Final Act. 2; App. Br. 2.

We therefore limit our discussion to independent claims 10 and 14.

¹ JFE Steel Corporation is the Applicant/Appellant and is identified as the real party in interest. App. Br. 1.

OPINION

After review of the respective positions provided by Appellant and the Examiner, we reverse the Examiner's prior art rejection of claims 10–14 under 35 U.S.C. § 103(a) essentially for the reasons presented by Appellant in the Appeal and Reply Briefs. We add the following for emphasis.

Independent claims 10 and 14 are directed to a grain-oriented electrical steel sheet having properties after beam irradiation restricted to the following requirements:

(a) the area ratio of irradiation mark(s) within an irradiation region of the high-energy beam is 2% or more and 20% or less (claim 10), or exceeds 20% (claim 14);

(b) the area ratio of protrusion(s) with a height of 1.5 μm or more within a surrounding portion of an irradiation mark is 60% or less (both claims); and

(c) the area ratio of exposed portion(s) of the steel substrate in an irradiation mark is 90% or less (claim 10) and 30% or more and 90 % or less (claim 14). Spec. ¶ 24².

According to the Specification, this “provide[s] a grain-oriented electrical steel sheet, on which magnetic domain refining treatment by strain application has been performed, having an insulating coating with excellent insulation properties and corrosion resistance.” *Id.* ¶ 8.

The Examiner finds that Yamaguchi “discloses a grain-oriented electrical steel sheet comprising linear strains and an insulating coating thereon” that differs from the claimed invention in that Yamaguchi “does not

² We refer to the Substitute Specification made of record on January 7, 2017 as “Specification” or “Spec.”

specify the area ratios as claimed.” Final Act. 2; Yamaguchi Abst.³ The Examiner finds that the claimed steel sheets and Yamaguchi’s steel sheets “are identical or substantially identical in structure or composition” and are “produced by identical or substantially identical processes.” Final Act. 2–3. According to the Examiner, the process conditions for making Yamaguchi’s steel Sample (1) are within the ranges of the process conditions disclosed in the Specification for the Appellant’s invention. Final Act. 3; *compare* Yamaguchi’s Table 1 (Sample (1)) *with* Spec. ¶¶48–51⁴. Based on this information and citing to *In re Best*, 562 F.2d 1252, 1255, the Examiner asserts that one skilled in the art, absent a showing to the contrary, would have reasonably expected that Yamaguchi’s process results in a steel sheet having the claimed properties. Final Act. 3. Therefore, the Examiner determined that “[a] prima facie case of obviousness exists.” *Id.* at 3.

Appellant acknowledges that the process conditions for Yamaguchi’s Sample (1) fall within the disclosed process conditions. App. Br. 4; Spec. ¶ 48. But, Appellant argues this does not necessarily mean that the properties of Claims 10 and 14 are satisfied. App. Br. 3. In support of this argument, Appellant points to Comparative Example 7 as having similar processing conditions as the conditions for producing Yamaguchi’s Sample (1)

³ The Examiner and Appellant appear to cite directly to portions of the reference. Final Act. 2 (citing to sections (4) and (6) of the reference); Reply Br. 3 (citing to the last 7 lines between column 5–6 in Yamaguchi). However, there is no full translation of this reference on the record. In addition, neither the Examiner nor Appellant directs us to or identifies any full translation of Yamaguchi. We therefore limit our consideration of Yamaguchi to the English Abstract and Table 1 of the reference.

⁴ The noted portions of the Specification correspond to the paragraphs relied upon by the Examiner from the published application to Inoue (US 2014/0360629 A1, published December 11, 2014).

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(differing only on the beam diameter (0.40 mm (Yamaguchi's Sample (1)) v. 0.50 mm (Appellant's Comparative Example 7)), but yielding a product that does not have the claimed properties. App. Br. 4; Spec. 23 (Table 1).

Appellant asserts that Yamaguchi's Sample (1), like Comparative Example 7, also does not have the claimed properties. App. Br. 4. Thus, Appellant argues that the Examiner has not established that all of the claimed characteristics are necessarily present in Yamaguchi's Sample (1). Reply Br. 1–2.

We agree with Appellant that the Examiner committed reversible error in the determination of obviousness. “Inherency [] may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (citing *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1269 (Fed. Cir. 1991)). That is, the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993). “In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

As Appellant argues, the operational parameters of Comparative Example 7 in the Specification are consistent with the operational parameters for Yamaguchi's Sample (1) but does not result in a steel sheet with the claimed properties. App. Br. 4. Thus, Appellant contends that Yamaguchi's Sample (1) would also not yield a steel sheet with the claimed properties. *Id.* Table 1 of the Specification presents numerous inventive

Examples where specific combinations of beam power, beam diameter, and scanning rate are selected to obtain the desired steel sheet. The Specification also recognizes that the operational parameters need to be determined to achieve a desired steel sheet. Spec. ¶¶ 48–56, 57 (discussing how the beam diameter depends on factors such as the acceleration voltage, the beam current, and the degree of vacuum). Thus, the key to Appellant’s argument is that specific combinations of operational parameters must be selected to result in a desired steel plate and not that any random combination of operational parameters, including the one taught by Yamaguchi, would lead to the desired steel plate. *See* Table 1 (*compare* inventive Example 3 (with beam power of 150 W, beam diameter of 0.80 mm, and scanning rate of 10 m/s) *with* inventive Example 9 (with beam power of 75 W, beam diameter of 0.40 mm, and scanning rate of 5 m/s)).

In view of this, the Examiner has not directed us to any portion of Yamaguchi that would have suggested to one of ordinary skill in the art that the operational parameters used in Sample (1) are specifically selected to achieve the particularly desired properties recited in claims 10 and 14. Consequently, the Examiner has not established that the steel sheets of Yamaguchi and the claimed invention are produced by the identical or substantially identical processes. Thus, the Examiner has not adequately provided a basis in fact and/or an adequate technical explanation to reasonably support the determination that the Yamaguchi’s steel plate possesses the characteristics of the claimed invention.

Accordingly, we reverse the Examiner’s rejection of claims 10–14 under 35 U.S.C. § 103(a) for the reasons presented by Appellant and given above.

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DECISION

The Examiner's prior art rejection of claims 10–14 under 35 U.S.C. § 103(a) is reversed.

REVERSED