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IP GROUP OF DLA PIPER LLP (US)
ONE LIBERTY PLACE
1650 MARKET ST, SUITE 5000
PHILADELPHIA, PA 19103

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TAKESHI IMAMURA, MINORU TAKASHIMA, and TATSUHIKO HIRATANI

Appeal 2019-000750
Application 14/373,973
Technology Center 1700

Before ROMULO H. DELMENDO, MICHAEL P. COLAIANNI, and LILAN REN, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 6, 8, 10, 12, 14, 16, 18, and 20. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42 and as named in the Application Data Sheet filed July 23, 2014. Appellant, JFE Steel Corporation, identifies itself as the real party in interest. Appeal Br. 1.

Appellant's invention is directed to electrical steel sheet used in a core material for a reactor excited at a high frequency (Spec. ¶ 1; Claim 6).

Claim 6 is representative of the subject matter on appeal:

> 6. An electrical steel sheet having a chemical composition comprising C: less than 0.010 mass%, Si: 1.5~10 mass% and the balance being Fe and incidental impurities, wherein a main orientation in a texture of a steel sheet is <111>//ND, an intensity ratio relative to randomly oriented specimen of the main orientation is not less than 5, an intensity ratio relative to randomly oriented specimen of {111}<112> orientation is not less than 10, and a final thickness of the steel sheet is not more than 0.20 mm.

Appellant argues the claims as a group (App. Br. 2−6). We select claim 6, the only independent claim on appeal, as representative of the group.

Appellant appeals the following rejection:

1. Claims 6, 8, 10, 12, 14, 16, 18, and 20 are rejected under 35 U.S.C. § 103(a) as unpatentable over Namikawa et al. (US 2002/0134466 pub. Sept. 26, 2002) ("Namikawa") in view of Arai et al. (US 5,354,389 iss. Oct. 11, 1994) ("Arai").

FINDINGS OF FACT & ANALYSIS

The Examiner's findings and conclusions regarding Namikawa and Arai are located on pages 4 to 7 of the Non-Final Action of January 17,

2018.[2] The Examiner finds that Namikawa discloses an electrical steel sheet having compositions that fall within the ranges recited in the claims but Namikawa fails to teach a main orientation in a texture of a steel sheet is <111>//ND and an intensity ratio relative to randomly oriented specimen of the main orientation is not less than 5 and an intensity ratio relative to randomly oriented specimen of {111}<112> orientation is not less than 10 (Non-Final Act. 4−5). The Examiner finds that Namikawa teaches a similar process as disclosed by Appellant for making the steel sheet but Namikawa does not teach a high reduction rate of cold rolling of about 96% (Non-Final Act. 5). The Examiner finds that Arai teaches in Figure 20 a relationship between cold rolling reduction and magnetic flux density B8 such that when the cold rolling reduction at the final stage is increased up to 95% or higher the magnetic properties such as flux density obtained are better (Non-Final Act. 5). The Examiner concludes that it would have been obvious to increase Namikawa's cold rolling reduction ratio to 95% or higher as taught by Arai in order to achieve better magnetic properties (Non-Final Act. 5−6).

Appellant argues that Namikawa and Arai fail to teach the same process used by Appellant to achieve an intensity ratio relative to randomly oriented specimen of {111}<112> orientation of not less than 10 as recited in claim 6 (App. Br. 3). Appellant contends that the process used in the application does not involve intermediate annealing and secondary cold rolling as taught by Arai (App. Br. 3). Appellant contends that Table 1 on page 15 of the Specification shows that processes that include intermediate

[2] The record also shows at least a Non-Final Rejection of September 15, 2016, a Non-Final Rejection of April 21, 2017, and a Final Rejection of August 7, 2017.

annealing do not achieve an intensity of the {111}<112> of greater than 10 (App. Br. 3). Appellant argues that Arai's secondary cold rolling would have led away from Appellant's techniques (App. Br. 3). Appellant contends that the Examiner's reliance on inherency in the combination of Namikawa and Arai is improper (App. Br. 3−4). Appellant argues that the two declarations of Takeshi Imamura dated August 7, 2017 and June 14, 2017 confirm that a rolling reduction ratio of 93% or more is critical to obtain an intensity ratio relative to randomly oriented specimen of {111}<112> orientation of not less than 10 for steel sheets of various final thicknesses (App. Br. 5).

Claim 6 is directed to an electrical sheet that has the property that the "main orientation in a texture of a steel sheet is <111>//ND, an intensity ratio relative to randomly oriented specimen of the main orientation is not less than 5, an intensity ratio relative to randomly oriented specimen of {111}<112> orientation is not less than 10, and a final thickness of the steel sheet is not more than 0.20 mm." According to Appellant, the property recited in claim 6 is only achievable if no intermediate annealing step is used between a hot rolling step and a cold rolling step in forming the steel sheet and a cold rolling reduction ratio of 93% or greater is used in forming the cold rolled steel strip (App. Br. 3). Appellant submits the Imamura Declaration dated August 7, 2017 which shows in Table II that in the absence of an anneal step between the hot rolling and cold rolling step in combination with a reduction ratio of greater than 93% for the cold rolling step yields an intensity of {111}<112> orientation of greater than 10. The Imamura Declaration dated June 14, 2017 shows in Table I that the absence of an annealing step after hot rolling the sheet and cold rolling at a reduction

ratio of at least 93% produces an intensity of {111}<112> of greater than 10. Although evidence in the Imamura Declarations use a steel sheet with 0.0047% carbon (C) whereas the claim includes steel compositions having less than 0.01% C, Appellant states that Table 2 of the Specification shows steel compositions have various carbon contents over the claimed range of which the inventive examples 1 and 3 to 8 all have a {111}<112> orientation intensity of not less than 10 (App. Br. 6).

In other words, Appellant's evidence supports the argument that in order to arrive at the claimed intensity ratio relative to randomly oriented specimen of {111}<112> of not less than 10, a process that excludes an annealing step between the hot rolling and cold rolling steps along with a reduction ratio in the cold rolling step of at least 93% is required.

With this understanding in mind, the Examiner's reliance on Namikawa to teach a process that forms an electrical sheet by hot rolling followed by cold rolling, with no annealing therebetween and Arai to teach the cold rolling reduction ratio is not adequately supported. The Examiner points to paragraphs 100, 106 126, 150, 174, 179, 210, 261, and 273 of Namikawa as teaching Appellant's disclosed process of forming the steel sheet (Non-Final Act. 5). Our review of those paragraphs reveals that Namikawa never states to avoid an annealing step between the hot rolling step and the cold rolling step. Rather, Namikawa teaches using a hot rolling step and a cold rolling step, but the Examiner's takes Namikawa's silence on annealing to mean that, necessarily, no annealing was done (Ans. 5). The Examiner directs us to no teaching in Namikawa to support that finding.

The Examiner finds that Arai teaches to use a reduction ratio of at least 95% for the secondary cold rolling step in Arai's process in order to

produce better magnetic properties (Fig. 20) (Non-Final Act. 5−6). Arai teaches that the improved magnetic properties are part of the process where annealing steps are added between the hot rolling step and the secondary cold rolling step (col. 22, Example 13).

On this record, the Examiner has not established that the same process disclosed by Appellant and required to achieve the recited property, "main orientation in a texture of a steel sheet is <111>//ND, an intensity ratio relative to randomly oriented specimen of the main orientation is not less than 5, an intensity ratio relative to randomly oriented specimen of {111}<112> orientation is not less than 10, and a final thickness of the steel sheet is not more than 0.20 mm," is taught or would have been suggested by the teachings of Namikawa and Arai. The Examiner has not established that combined teachings would have suggested or yielded an electrical steel sheet having the recited properties.

We reverse the Examiner's § 103 rejection over Namikawa in view of Arai.

CONCLUSION

In summary:

Claims Rejected	Basis	Affirmed	Reversed
6, 8, 10, 12, 14, 16, 18, and 20	§ 103 Namikawa in view of Arai		6, 8, 10, 12, 14, 16, 18, 20
Overall Outcome			6, 8, 10, 12, 14, 16, 18, 20

REVERSED