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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte HEUNG-YUN KIM, IL-RYOUNG SOHN, and DAE-CHUL BAE

Appeal 2019-003911
Application 15/250,022
Technology Center 1700

Before MONTÉ T. SQUIRE, AVELYN M. ROSS, and BRIAN D. RANGE,
Administrative Patent Judges.

SQUIRE, *Administrative Patent Judge.*

DECISION ON APPEAL¹

Appellant² appeals under 35 U.S.C. § 134(a) from the Examiner’s decision rejecting claims 1–19, which are all of the claims pending in this application. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ In this Decision, we refer to the Specification filed Aug. 29, 2016 (“Spec.”); Final Office Action dated Jan. 22, 2018 (“Final Act.”); Advisory Action dated Apr. 20, 2018 (“Advisory Act.”); Appeal Brief filed July 3, 2018 (“Br.”); and Examiner’s Answer dated Oct. 19, 2018 (“Ans.”). There is no reply brief.

² We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies POSCO as the real party in interest. Br. 3.

CLAIMED SUBJECT MATTER

Appellant's claimed subject matter relates to a method for manufacturing a hot press formed (HPF) article having a hot dip aluminum plating layer being formed on a surface of a substrate steel sheet, and an HPF article manufactured by that method. Spec. 1:14–22, 3:9–11, 5:11–14; Abstract. According to Appellant, the claimed method provides an HPF article having excellent delamination resistance. Spec. 1:14–15, 4:23–27.

Claim 10 illustrates the claimed subject matter on appeal and is reproduced below from the Claims Appendix to the Appeal Brief:

10. A method for manufacturing a hot press formed (HPF) article having excellent delamination resistance, the method comprising:

preparing a steel sheet including, in % by weight, C: 0.18% to 0.25%, Si: 0.1 % to 1.0%, Mn: 0.9% to 1.5%, P: 0.03% or less, S: 0.01 % or less, Al: 0.01 % to 0.05%, Cr: 0.05% to 0.5%, Ti: 0.01 % to 0.05%, B: 0.001 % to 0.005, N: 0.009% or less, and a remainder of Fe and other impurities;

hot dip aluminum plating the steel sheet by, after heating the steel sheet to a temperature of 550°C to 850°C, immersing the steel sheet in a hot dip aluminum plating bath maintained at a temperature of 640°C to 680°C and composed of, in % by weight, Si: 7% to 13%, Fe: less than 3%, and the remainder of Al and other unavoidable impurities;

skin pass milling (SPM) the hot dip aluminum plating steel sheet with an elongation of 0.5% to 3% after cooling the hot dip galvanized steel sheet;

alloying a hot dip aluminum plating layer on a surface of the hot dip aluminum plated steel sheet by heating the hot dip aluminum plated steel sheet to a temperature of 850°C to 950°C and maintaining the temperature for a certain period of time; and

manufacturing a hot press formed (HPF) product by rapidly cooling the alloyed hot dip aluminum plated steel sheet

to a temperature of 300°C or lower while hot press forming the alloyed hot dip aluminum plated steel sheet.

Br. 20–21 (key disputed claim language italicized and bolded).

REFERENCES

The Examiner relies on the following prior art references as evidence in rejecting the claims on appeal:

| Name | Reference | Date |
|-----------------------------------|--------------------|---------------|
| Yoshikawa et al. ("Yoshikawa") | US 2006/0121305 A1 | June 8, 2006 |
| Nishibata et al. ("Nishibata") | US 2006/0185774 A1 | Aug. 24, 2006 |
| Maki et al. ("Maki") | US 2014/0030544 A1 | Jan. 30, 2014 |

REJECTIONS

On appeal, the Examiner maintains (Ans. 3) the following rejections:

1. Claim 1–19 are rejected under 35 U.S.C. § 103 as being unpatentable over Maki in view of Yoshikawa and Nishibata ("Rejection 1"). Ans. 6.
2. Claims 1–9 are rejected under 35 U.S.C. § 103 as being unpatentable over Maki ("Rejection 2"). *Id.* at 3.

OPINION

Rejection 1

The Examiner rejects claims 1–19 under § 103 as obvious over the combination of Maki, Yoshikawa, and Nishibata (Ans. 6–9), which we refer to as Rejection 1.

The Examiner determines that the combination of Maki, Yoshikawa, and Nishibata suggests a method for manufacturing an HPF article satisfying all of the limitations of claim 10 and concludes the combination would have rendered the claim obvious. Ans. 6–9.

Regarding the “manufacturing a hot press formed (HPF) product by rapidly cooling the alloyed hot dip aluminum plated steel sheet to a temperature of 300°C or lower while hot press forming the alloyed hot dip aluminum plated steel sheet” recitation of claim 10, the Examiner relies principally on Maki for suggesting that element of the claim. *Id.* at 8–9. Although the Examiner acknowledges that Maki’s process differs from the claimed process in that the claimed process requires cooling the product *during press forming* to a temperature of 300°C or less, and Maki’s process requires cooling its product *after press forming*, the Examiner finds that the processes are substantially identical and thus form “a substantially identical product.” *Id.* at 3 (finding the processes form a substantially identical product “whether cooled during, or after the press forming operation”).

The Examiner further finds and reasons that “substantially identical materials treated in a substantially identical manner are expected to result in products having substantially identical structure and properties.” *Id.* at 6.

Based on the above findings, the Examiner concludes

[o]ne of ordinary skill in the art would have found it obvious to cool the product of Maki et al. during the press forming operation where cooling during press forming has been demonstrated in the art as a suitable alternative to cooling after the press forming operation.

Id. at 8.

Appellant argues the Examiner’s rejection should be reversed because Maki’s process is not substantially identical to the claimed process and thus,

the products formed by Maki's process are not substantially identical to the HPF article recited in the claims. Br. 12–16. In particular, Appellant argues that, in contrast to the claimed process, which requires rapidly cooling the alloyed hot dip aluminum plated steel sheet to a temperature of 300°C or lower while hot press forming the alloyed hot dip aluminum plated steel sheet, i.e., during hot press forming, Maki's process involves cooling its steel sheet after hot press forming. *Id.* at 12–14 (citing Maki ¶¶ 107, 111, 114, 127).

Appellant further argues the HPF products formed by Maki's process and the claimed process are not substantially identical because the “microstructures of a final steel product is crucially affected by the history of heat treatments and associated temperatures, and plastic forming and associated temperatures.” *Id.* at 14; *see also id.* at 12 (quoting Spec. 22:31–23:2 (“Removing the formed article from the mold at a steel sheet temperature of 300°C or higher after the hot dip press may cause deformation due to thermal stress.”)).

The weight of the evidence supports Appellant's arguments. On the record before us, we are not persuaded the Examiner has identified sufficient evidence in the record to support the finding that Maki's process and the claimed process are substantially identical and necessarily form substantially identical products. We, thus, are also not persuaded by the Examiner's conclusion it would have been obvious to one of ordinary skill to have arrived at the claimed invention. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992) (holding the examiner bears the initial burden of establishing a *prima facie* case of obviousness).

The Examiner's statements at pages 8–9 and 10–11 of the Answer regarding Maki's process and products formed by that process being “substantially identical” to the claimed process and products formed are not persuasive because they are largely conclusory and unsupported by sufficient evidence in the record. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (explaining rejections “cannot be sustained by mere conclusory statements”). Although the Examiner asserts that, “the process of Maki *et al.* is considered to be substantially identical to that of appellants” (Ans. 11) and “it is also known in the art of press forming to cool the product either during or after press forming” (*id.* at 11), the Examiner does not direct us to persuasive evidence or provide adequate technical reasoning to sufficiently support any such finding. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (requiring “reasoning with some rational underpinning to support the legal conclusion of obviousness”) (quoting *Kahn*, 441 F.3d at 988).

Contrary to what the Examiner's rejection seems to imply, the fact that it may be technically possible to operate Maki's process to cool its steel sheet during forming in the manner claimed, the Examiner provides no meaningful technical discussion regarding what impact such a modification would have on the strength and surface properties of the sheet, which are features that Maki teaches are required (Maki ¶¶ 1, 15, 47). *See also Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (“[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.”).

Thus, for principally the same reasons provided by Appellant at pages 12–17 of the Appeal Brief, we are not persuaded the Examiner has

established by a preponderance of the evidence that Maki's process and the claimed process are substantially identical and form substantially identical products, and, therefore, do not sustain the Examiner's rejection of claim 10 and determination it would have been obvious to one of ordinary skill to arrive at the claimed subject matter.

Because the Examiner's rejection of claims 1–9 and 11–19 rest on the same flawed finding that Maki's process and the claimed process are substantially identical and form substantially identical products and obviousness conclusion, we also do not sustain the Examiner's rejection of those claims.

Accordingly, we reverse the Examiner's rejection of claims 1–19 under 35 U.S.C. § 103 as obvious over the combination of Maki, Yoshikawa, and Nishibata.

Rejection 2

The Examiner's rejection of claims 1–9 under § 103 as obvious over Maki (Ans. 3–6), which we refer to as Rejection 2, is based on the Maki reference and rests on the same flawed finding that Maki's process and the claimed process are substantially identical and form substantially identical products previously discussed above in reversing the Examiner's Rejection 1. *See* Final Act. 3 (stating that “substantially identical materials treated in substantially identical manner are expected to result in products having substantially identical structure and properties”).

We, therefore, reverse the Examiner's Rejection 2 for principally the same reasons stated above for reversing Rejection 1.

CONCLUSION

In summary:

| Claim(s) Rejected | 35 U.S.C. § | Reference(s)/Basis | Affirmed | Reversed |
|------------------------------|--------------------|-------------------------------|-----------------|-----------------|
| 1-19 | 103 | Maki, Yoshikawa, Nishibata | | 1-19 |
| 1-9 | 103 | Maki | | 1-9 |
| Overall Outcome | | | | 1-19 |

REVERSED