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General Electric Company
GE Global Patent Operation
901 Main Avenue
3rd Floor
Norwalk, CT 06851

EXAMINER	
SAAD, ERIN BARRY	

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte YAN CUI, DANIEL JAMES DORRIETY,
SRIKANTH CHANDRUDU KOTTILINGAM,
DECHAO LIN, HAI BUU SAM, and BRIAN LEE TOLLISON

Appeal 2015-006353
Application 13/083,181
Technology Center 1700

Before JEFFREY W. ABRAHAM, AVELYN M. ROSS, and JEFFREY R. SNAY, *Administrative Patent Judges*.

ROSS, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

Appellants[2] appeal under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 1–20. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] In our decision below, we refer to the Specification filed April 8, 2011 as amended February 18, 2014 (Spec.), the Final Office Action appealed from, mailed September 24, 2014 (Final Act.); the Appeal Brief filed December 23, 2014 (Appeal Br.); the Examiner's Answer mailed April 13, 2015 (Ans.); and the Reply Brief filed May 20, 2015 (Reply Br.).

[2] Appellants identify the real party in interest as General Electric Company. Appeal Br. 1.

STATEMENT OF CASE

The claims are directed to a method of establishing filler metal chemistry for a filler rod for joining components. Claims Appendix at Appeal Br. 10. Claim 1, reproduced below, is illustrative of the claimed subject matter:

> 1. A method of establishing filler metal composition for joining components, the method comprising:
>
> determining an initial desired filler metal chemistry, wherein the initial filler metal chemistry establishes a weld metal adjacent to fusion boundary (WMATFB) below a threshold line between a weldable material range and a non-weldable material range;
>
> adjoining a first filler rod having a first portion of the desired filler metal chemistry and a second filler rod having a second portion of the desired filler metal chemistry to form a test filler rod;
>
> joining a first component formed from a first nickel alloy material to a second component formed from a second nickel alloy material at a weld joint with the test filler rod providing a filler metal portion of the weld joint; and
>
> testing the weld joint for desired mechanical, chemical, and weldability properties to establish a desired filler metal composition.

Claims Appendix at Appeal Br. 10.

REJECTIONS

The Examiner made the following rejections:

A. Claims 1–3, 8–12, and 17–20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sampath[3] in

[3] K. Sampath, *Transverse-Weld Tensile Properties of a New Al-4Cu-2Si Alloy as Filler Metal*, Vol. 18(9) JOURNAL OF MATERIALS ENGINEERING AND PERFORMANCE 1218–1225 (Dec. 2009) (hereinafter "Sampath").

view of Special Metals,[4] Welding Research Bulletin,[5] and Schaeffer.[6] Final Act. 2.

B. Claims 4–7 and 13–16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sampath, Special Metals, Welding Research Bulletin, Schaeffer, and further in view of Yang.[7] *Id.* at 7.

Appellants seek our review of Rejections A and B. Appellants present argument directed to independent claim 1 and provide no additional argument as to claims 2–20 separate from what is argued for claim 1. Appeal Br. 6–8. Therefore, we focus our discussion below on claim 1 (Rejection A) to resolve all issues on appeal.

OPINION

The Examiner rejects claim 1 (among others) as being unpatentable over Sampath, Special Metals, Welding Research Bulletin, and Schaeffer. Final Act. 2. The Examiner finds that Sampath teaches a method of establishing a filler metal composition that generally includes the method steps of claim 1. *Id.* 2–3. The Examiner acknowledges that Sampath does not teach "that the initial filler metal chemistry establishes a weld metal

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[4] Special Metals Welding Products Company, *Nickel Alloy Welding Product Catalogue* (hereinafter "Special Metals").
[5] M. Prager & C. S. Shira, *Welding of Precipitation-Hardening Nickel-Base Alloys*, WELDING RESEARCH COUNCIL BULLETIN (Feb. 1968) (hereinafter "Welding Research Bulletin").
[6] Schaeffer et al., US 2008/0023531 A1, published January 31, 2008 (hereinafter "Schaeffer").
[7] Y. K. Yang & S. Kou, *Fusion-Boundary Macrosegregation in Dissimilar-Filler Metal Al-Cu Welds*, 86 THE WELDING JOURNAL 331-s–339-s (Nov. 2007) (hereinafter "Yang").

adjacent to fusion boundary below a threshold line between a weldable material range and a non-weldable material range" or "that the components are nickel." *Id.* at 3. But, the Examiner finds that "Special Metals discloses a chart for welders to use to determine the filler metal composition required for nickel alloys based on the welding process and the property requirements (see chart)" and the "Welding Research Council Bulletin shows that it is known in the art [to] use a chart to determine whether or not a material is weldable (figure 1)." *Id.* And, the Examiner finds that "Schaeffer discloses welding two nickel superalloy materials together by using a filler wire (abstract)." *Id.* at 4. The Examiner concludes that one skilled in the art at the time would have found it obvious

> to determine the filler metal composition/chemistry based on a known chart or graph to ensure that the weld has the desired/required properties needed for a strong joint. By looking [at] a chart to determine the filler composition required the user would not have to perform any unnecessary experiments to determine the desired composition.

Id. at 3. The Examiner also finds that "[o]ne skilled in the art at the time of the invention would look to the method of Sampath for determining the filler metal composition for other workpieces besides aluminum." *Id.* at 4.

Appellants begin by arguing that Sampath appears to select test rods randomly rather than "to first establish chemistry and then choose rods that, when joined have a chemical composition that establishes the desired chemistry." Appeal Br. 6. Appellants explain that "[a]t best, a composition of the candidate rod was established ex post facto[,] [m]eaning once formed, the composition was noted." *Id.*

Appellants do not convince us of reversible error. As the Examiner explains,

> By selecting two rods from a selection of off-the-shelf filler rods, the user essentially determined the filler rod chemistry. One skilled in the art selects the filler rods based on the welding parameters and workpieces. Therefore, by selecting the rods to be twisted and used for welding, one has determined the initial desired filler rod chemistry.

Ans. 9. Moreover, and as the Examiner finds (Final Act. 2), Sampath expressly teaches a four-step process beginning with "identifying *prospective* chemical compositions" for the filler material. Sampath at 1220 (emphasis added). Sampath further explains that "[a] mass balance equation that use[s] the size and nominal chemical composition of the individual COTS [, i.e., commercial off-the-shelf,] wire electrodes or filler rods was employed to *estimate the chemical composition* of the twisted wire rods." *Id.* at 1221 (emphasis added). Thus, and contrary to Appellants' assertion that Sampath amounts to an ex post facto determination (Appeal Br. 6), there *is* an effort in Sampath "to first establish chemistry and then choose rods that, when joined have a chemical composition that establishes the desired chemistry." *Id.*

Next Appellants argue that the prior art does not teach that "the initial filler metal chemistry establishes a weld metal adjacent to fusion boundary (WMATFB) below a threshold line between a weldable material and non-weldable material range" as required by claim 1. Appeal Br. 6–7. According to Appellants, "[w]hether a material is or is not weldable does not equate to the WMATFB" because "metals that may be joined may still experience strain age cracking (SAC)." *Id.* at 7. Appellants also argue that because Sampath relates to aluminum filler metals and Special Metals concerns nickel alloys, "one of ordinary skill in the art would not find it

obvious to turn to a bulletin that aids a user in choosing a nickel based filler rod to determine a filler metal chemistry for aluminum rods." *Id.*

Appellants' arguments are not persuasive of reversible error. Appellants' argument that Sampath and Special Metals do not "recognize the existence of the WMATFB" (Appeal Br. 7) misses the point. The Examiner relies upon Welding Research Bulletin—not Sampath or Special Metals—to "show[] that it is known in the art [to] use a chart to determine whether or not a material is weldable (figure 1)." Final Act. 3. And, Appellants' contention that "[t]here is no mention of the WMATFB in the Welding Research Bulletin" (Appeal Br. 7) is unavailing given that Appellants supplied the Welding Research Bulletin to the Examiner as evidence "that the Weld Metal Adjacent Fusion Boundary (WMAFB) and threshold lines were concepts well known in the art." *See* Reply to Non-Final Action, filed February 18, 2014, at 8; Ans. 11. Notably, in reply, Appellants do not dispute or refute this admission. Reply Br. 2–3. Thus, as the Examiner appropriately finds (Ans. 11), Welding Research Bulletin teaches WMATFB.

Appellants' argument that because Sampath is concerned with aluminum filler materials and Special Metals relates to nickel filler materials, one skilled in the art "would not find it obvious to turn to a bulletin that aids a user in choosing a nickel based filler rod to determine a filler metal chemistry for aluminum rods" (Appeal Br. 7), does not address the rejection as presented by the Examiner. The rejection is based on a *combination of four references* where Special Metals (relating to Ni filler alloys), as used by the Examiner, is limited to illustrating charts that may be consulted to determine the filler metal chemistry based on information supplied by manufacturers. Ans. 10. Welding Research Bulletin (relating to

Al/Ti filler materials), instead, is relied upon by the Examiner to teach WMATFB and to assist the skilled artisan in "determin[ing] the filler metal composition/chemistry based on a known chart or graph to ensure that the weld has the desired/required properties needed for a strong joint. By looking [to] a chart to determine the filler composition required the user would not have to perform any unnecessary experiments to determine the desired composition." Ans. 11.

Accordingly, Appellants' arguments do not reveal reversible error in the findings and conclusions made by the Examiner, and we sustain the Examiner's rejection.

CONCLUSION

The Examiner did not reversibly err in rejecting claims 1–20 as unpatentable under 35 U.S.C. § 103(a).

DECISION

For the above reasons, the Examiner's rejection of claims 1–20 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

AFFIRMED