UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/995,880	06/19/2013	Masakazu Seki	SKLF141302	6006

26389 7590 01/30/2019

CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1201 Third Avenue
Suite 3600
Seattle, WA 98101

EXAMINER
MORILLO, JANELL COMBS

ART UNIT	PAPER NUMBER
1733	

NOTIFICATION DATE	DELIVERY MODE
01/30/2019	ELECTRONIC

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

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

efiling@cojk.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MASAKAZU SEKI, SATOSHI SUZUKI, TOMOHIKO FURUTANI, KENJI YAMAMOTO, and KOICHI ASHIZAWA

Appeal 2018-000770
Application 13/995,880
Technology Center 1700

Before JAMES C. HOUSEL, BRIAN D. RANGE, and MERRELL C. CASHION, JR., *Administrative Patent Judges*.

HOUSEL, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

Appellants[2] appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claim 1.[3] We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

---

[1] Our Decision refers to the Specification ("Spec.") filed June 19, 2013, the Examiner's Final Office Action ("Final Act.") dated January 11, 2017, Appellants' Appeal Brief ("Appeal Br.") filed May 5, 2017, the Examiner's Answer ("Ans.") dated September 12, 2017, and Appellants' Reply Brief ("Reply Br.") filed October 30, 2017.

[2] Appellants identify UACJ Corporation and UACJ Foil Corporation as the real parties in interest (Appeal Br. 3).

[3] Pending claim 2 has been withdrawn from consideration by the Examiner and is not before us on appeal.

We AFFIRM.

STATEMENT OF THE CASE

The invention relates to an aluminum foil for use as positive electrode material in lithium-ion secondary batteries (Spec. ¶ 1). Appellants disclose that, although aluminum foils whose Al purity is 99% or more has been used as electrodes due to their high electrical conductivity, the high Al purity makes it difficult to improve the foil strength (*id.* ¶ 6). Appellants disclose an inventive aluminum foil having high post-drying strength after application of an active material while keeping a high electrical conductivity (*id.* ¶ 10). Appellants disclose that the inventive aluminum foil is produced by subjecting an aluminum alloy ingot to a homogenizing treatment at high temperature and regulating the solid solution precipitation conditions (*id.* ¶ 11).

Claim 1, reproduced below from the Claims Appendix to the Appeal Brief, is illustrative of the subject matter on appeal. Indenting and paragraphing have been added and the limitations at issue are italicized to facilitate understanding of the claim.

> 1. An aluminum alloy foil for an electrode current collector, comprising
>
> 0.03 to 0.1 mass% (hereinafter, "mass%" is simply referred to as "%") of Fe,
>
> 0.01 to 0.1 % of Si, and
>
> 0.0001 to 0.01 % of Cu,
>
> with the rest being Al and unavoidable impurities,
>
> wherein the aluminum alloy foil after final cold rolling has a tensile strength of 180 MPa or higher, a 0.2% yield strength of 160 MPa or higher, and an electrical conductivity of 60% IACS or higher; and
>
> the aluminum alloy foil has a tensile strength of 170 MPa or higher and a 0.2% yield strength of 150 MPa or higher even

after the aluminum alloy foil is subjected to heat treatment at any of 120°C for 24 hours, 140°C for 3 hours, and 160°C for 15 minutes.

REJECTIONS

The Examiner maintains,[4] and Appellants request our review of, the following grounds of rejection:

1. Claim 1 under 35 U.S.C. § 102(b) as anticipated by Hiroshi;[5]

2. Claim 1 on the ground of non-statutory double patenting as unpatentable over claims 1 and 2 of each of U.S. Patent Nos. 9,543,588,[6], 9,666,867,[7] and 9,715,971,[8] claims 1 and 3 of U.S. Patent No. 9,698,426,[9,] and claim 1 of each of U.S. Patent Nos. 9,847,530,[10] and 10,050,257;[11,12] and

---

[4] In the Final Office Action, the Examiner set forth seven non-statutory double patenting rejections (Final Act. 7–10, ¶¶ 13–19). In the Examiner's Answer, the Examiner repeated only six of these double patenting rejections, although the Examiner states that every ground set forth in the Final Office Action is maintained (no rejection was withdrawn). However, Appellants acknowledge that the provisional double patenting rejection not repeated in the Answer over claims 1 and 3 of copending U.S. Patent Application No. 14/395,455 is pending (Reply Br. 2). We, therefore, hold the Examiner's omission of this seventh double patenting rejection to be inadvertent. We have revised the list of pending rejections to correct this omission.

[5] Hiroshi et al., JP 11-162470, published June 18, 1999 ("Hiroshi").

[6] Seki et al., US 9,543,588 B2, issued January 10, 2017.

[7] Seki et al., US 9,666,867 B2, issued May 30, 2017.

[8] Suzuki et al., US 9,715,971 B2, issued July 25, 2017.

[9] Furutani et al., US 14/395,455, filed October 17, 2014; now US 9,698,426 B2, issued July 4, 2017.

[10] Seki et al., US 14/235,779, filed January 28, 2014; now US 9,847,530 B2, issued December 19, 2017.

[11] Seki et al., US 13/995,916, filed June 19, 2013; now US 10,050,257 B2, issued August 14, 2018.

[12] We have converted each of the non-statutory double patenting rejections over copending U.S. Patent Application Nos. 13/995,916, 14/235,779, and

3. Claim 1, provisionally, on the ground of non-statutory double patenting as unpatentable over claim 1 of copending U.S. Patent Application No. 14/235,748.[13]

ANALYSIS

Rejections 2 and 3

We note Appellants did not request our review of, or challenge or otherwise mention, any of the Examiner's provisional and non-provisional non-statutory double patenting rejections in the Appeal Brief. In the Reply Brief, Appellants present a new argument not raised in the Appeal Brief concerning only the non-statutory double patenting rejections over U.S. Patent Nos. 9,543,588 and 9,666,867 (Reply Br. 1–4). Under regulations governing appeals to the Board, any new argument not timely presented in the Appeal Brief will not be considered when filed in a Reply Brief, absent a showing of good cause explaining why the argument could not have been presented in the Appeal Brief. *See* 37 C.F.R. § 41.41. *See also Ex parte Borden*, 93 USPQ2d 1473, 1476–77 (BPAI 2010) (informative). Appellants have provided this record with no such showing. As such, we will not consider this new argument in the Reply Brief.[14]

14/395,455 to non-provisional rejections because each of these patent applications has issued as a patent. In view of this, we note that the scope of the claims of the copending Applications may have changed from the scope of the claims as addressed by the Examiner during prosecution and the Examiner may have to ascertain the appropriateness of these rejections.

[13] Seki et al., US 14/235,748, filed January 28, 2014.

[14] We note Appellants' argument that the copending claims of US 9,543,588 and US 9,666,867 recite an amount of Mn of 0.01% or less, suggesting that Mn is not an unavoidable impurity within the scope of claim 1 in this case (Reply Br. 2). We also note that Appellants identify an amount of unavoidable impurities to be preferably 0.02% or less, which encompasses

Therefore, for the reasons given by the Examiner, we summarily affirm each of the Examiner's non-statutory double patenting rejections.

Rejection 1

We review the appealed rejection for error based upon the issues identified by Appellants and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) *cited with approval in In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) ("[I]t has long been the Board's practice to require an applicant to identify the alleged error in the examiner's rejections.")). After considering the evidence presented in this Appeal and each of Appellants' arguments, we are persuaded that Appellants identify reversible error in the Examiner's finding of anticipation. Thus, we affirm the Examiner's rejections (except where explained below) for the reasons expressed in the Final Office Action and the Answer. We add the following primarily for emphasis.

A claim is anticipated only where "each and every limitation is found either expressly or inherently in a single prior art reference." *Celeritas Techs., Ltd. v. Rockwell Int'l. Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998). "A claimed invention cannot be anticipated by a prior art reference if the allegedly anticipatory disclosures cited as prior art are not enabled." *Amgen, Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1354 (Fed. Cir. 2003). In particular, the teaching of the reference must enable those skilled in the art to make the claimed invention without undue experimentation. *In re Elsner*, 381 F.3d 1125, 1128 (Fed. Cir. 2004) (citing *In re LeGrice*, 301 F.2d 929, 939 (CCPA 1962).

---

the amount of Mn recited in the copending claims of these two patents (*compare* Spec. ¶ 19 *with* US 9,543,588, 4:59–61, and US 9,666,867, 5:3–5).

The Examiner finds Hiroshi teaches an aluminum alloy foil for a current collector, the alloy consisting or of 0.005 wt.% Cu, 0.05 wt.% Fe, 0.03 wt.% Si, and the balance being aluminum, wherein the alloy has a tensile strength of 200 MPa (Ans. 3). The Examiner finds that this alloy compositionally falls within the compositional ranges recited in claim 1 and also meets the recited tensile strength (*id.*). However, the Examiner acknowledges that Hiroshi fails to teach the alloy's electrical conductivity (YS) or its properties after heat treating according to the recited parameters (*id.*). Nonetheless, the Examiner finds that Hiroshi's aluminum alloy would inherently possess the recited electrical conductivity and recited properties after heat treatment because Hiroshi's alloy "falls within the claimed alloying ranges" (*id.*, citing *In re Spada*, 911 F.2d 705, 709 (Fed. Cir. 1990); *In re Best*, 562 F.2d 1252, 1254–5 (CCPA 1977); *Atlas Powder Co. v. Ireco Inc.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999); MPEP 2112.01).

Appellants argue that Hiroshi is not enabled for a high Al purity alloy have a tensile strength of 200 MPa and, therefore, cannot anticipate claim 1 (Appeal Br. 5). Appellants contend that Hiroshi fails to disclose any process of producing a high Al purity alloy with a tensile strength of 200 MPa (*id.* at 7). Appellants concede that Hiroshi discloses a process of roughening the surface through the use of wet blasting, but discloses a recommended tensile strength that avoids damage from this wet blasting (*id.*).

In support of this argument, Appellants direct attention to the Declaration under 37 C.F.R. § 1.132 of Kenji Yamamoto ("first Yamamoto Declaration" or "1st Decl.") filed May 9, 2016, and the Declaration under 37 C.F.R. § 1.132 of Kenji Yamamoto ("second Yamamoto Declaration" or "2nd Decl.") filed November 22, 2016 (Appeal Br. 6, 8–12). Appellants

assert that the characteristics of an aluminum alloy have a general range depending on composition (*id.* at 8–9; 2nd Decl. ¶ 5). Appellants also assert that high Al purity alloys such as that of claim 1 "generally have lower tensile strength when the purity of Al rises, as can be seen with 1000 series aluminum alloys" (Appeal Br. 9; 2nd Decl. ¶ 6). As such, Appellants contend that characteristics of an aluminum alloy are determined by the alloy's microstructure, which in turn is realized not only by the alloy's composition, but by restricting the alloy's manufacturing conditions (Appeal Br. 10; 1st Decl. ¶ 6).

Appellants next urge that Hiroshi's aluminum alloy of Example 1 is unusual because, despite its high purity (which the ordinary artisan would expect to have a lower tensile strength), Hiroshi teaches it has a high tensile strength (Appeal Br. 10–11; 2nd Decl. ¶ 6). As such, Appellants contend that Hiroshi's Example 1 alloy has a disclosed tensile strength that is against the common knowledge in the art that "tensile strength becomes lower as the purity of Al becomes higher" (Appeal Br. 11; 2nd Decl. ¶¶ 6, 7). Because elemental composition alone would not be expected to produce similar tensile strength as Hiroshi's Example 1 alloy, and there is no disclosure as to the manufacturing conditions of this alloy that would give such an unusually high tensile strength of 200 MPa, Appellants argue that those skilled in the art cannot produce Hiroshi's Example 1 alloy without undue experimentation (Appeal Br. 12–13).

In response, the Examiner acknowledges that high purity Al alloys typically have lower strength than that of claim 1 and Hiroshi's Example 1 alloy (Ans. 8). In addition, the Examiner acknowledges that the strength of an alloy is dependent on the heat treatment temper (*id.*). The Examiner

notes Appellants' argument that "both the composition and the manufacturing conditions are necessary to determine the characteristics of an aluminum alloy" (*id.*; Appeal Br. 10). However, the Examiner finds that "[o]ne of skill in the art would know the processing conditions (i.e. work-hardening a foil by cold rolling, etc) necessary to optimize strength for a given alloy composition" (Ans. 8, ¶ 10; *see also*, *id.* at 9, ¶ 11). The Examiner determines that Appellants have not shown that Hiroshi's Example 1, rather than AA1080, processed into a thin foil, and further processed as set forth in Hiroshi, would not have the tensile strength Hiroshi discloses (*id.*). The Examiner also determines that Appellants have not provided "specific evidence clearly showing that [Hiroshi's alloy foil] does not have the claimed properties" (*id.* at 9, ¶ 12). The Examiner further determines that, though Hiroshi fails to disclose the exact parameters for cold rolling and forming the Example 1 alloy foil, "one of skill in the art would have been enabled to have formed said [Example 1] alloy foil by conventional processing" (*id.* at 11, ¶ 14).

Appellants' arguments and evidence is persuasive that the Hiroshi disclosure fails to enable those of ordinary skill in the relevant art to make the Example 1 alloy such that it has a tensile strength of 200 MPa. Appellants' evidence establishes that an aluminum alloy's composition and manufacturing conditions both contribute to the alloy's microstructure that dictates its properties. Moreover, Appellants' evidence establishes that Hiroshi's Example 1 alloy is unusual in that it is disclosed to have a high tensile strength well above those of alloys that are compositionally similar. Appellants' evidence further establishes that alloys that are conventionally processed to have high tensile strength have low electrical conductivity, and

alloys that are conventionally processed to have high electrical conductivity have low tensile strength. Finally, there is no dispute that Hiroshi fails to disclose the manufacturing conditions for producing the Example 1 alloy foil having a tensile strength of 200 MPa. Given Appellants' evidence, we are persuaded that, following conventional processing, Hiroshi fails to enable an Example 1 alloy foil that not only has a tensile strength of 200 MPa, but also inherently has an electrical conductivity of 60% IACS or higher.

Contrary to the view of the Examiner, Appellants are not required to produce Hiroshi's Example 1 alloy foil to establish that Hiroshi fails to enable production of an alloy foil having the properties recited in claim 1. Indeed, requiring such would necessitate experimentation to determine the manufacturing conditions necessary to produce the Example 1 alloy foil having a tensile strength of 200 MPa because there is no dispute that Hiroshi fails to disclose these conditions. Appellants' evidence suggests that such experimentation would not be routine. Instead, Appellants are merely required to establish by a preponderance of the evidence that the ordinary artisan would not have a reasonable expectation of successfully producing an alloy foil as recited in claim 1 following Hiroshi's teaching without undue experimentation. Here, based on Appellants' evidence, the ordinary artisan would understand that a high purity Al alloy foil such as Hiroshi's Example 1 would not likely have both a high tensile strength and a high electrical conductivity following conventional manufacturing conditions.

Therefore, we are persuaded that Appellants have identified reversible error in the Examiner's finding of anticipation by Hiroshi because Hiroshi is not enabled to produce an aluminum alloy foil having the composition and

properties as recited in claim 1. Accordingly, we do not sustain the Examiner's anticipation rejection of claim 1.

DECISION

Upon consideration of the record, and for the reasons given above and in the Appeal and Reply Briefs, the decision of the Examiner rejecting claim 1 under 35 U.S.C. § 102(b) as anticipated by Hiroshi is *reversed.*

However, upon consideration of the record, and for the reasons given above and in the Final Office Action and the Examiner's Answer, the decision of the Examiner rejecting claim 1 on the ground of non-statutory double patenting as unpatentable over each of claims 1 and 2 of U.S. Patent No. 9,543,588, claims 1 and 2 of U.S. Patent No. 9,666,867, and claims 1 and 2 of U.S. Patent No. 9,715,971, and provisionally rejecting claim 1 on the ground of non-statutory double patenting over each of claim 1 of copending U.S. Patent Application No. 13/995,916, claim 1 of copending U.S. Patent Application No. 14/235,748, claim 1 of copending U.S. Patent Application No. 14/235,779, and claims 1 and 3 of copending U.S. Patent Application No. 14/395,455, 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