



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.
14/326,590	07/09/2014	Song Taek Oh	LGCHEM 3.11-496 CON (E)	2980
86765	7590	06/16/2020	EXAMINER	
LGCHEM Lerner, David, Littenberg, Krumholz & Mentlik, LLP 20 Commerce Drive Cranford, NJ 07016			KOROVINA, ANNA	
			ART UNIT	PAPER NUMBER
			1729	
			NOTIFICATION DATE	DELIVERY MODE
			06/16/2020	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):

eOfficeAction@lerner david.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SONG TAEK OH, SANG UCK LEE, and IL HONG KIM

Appeal 2020-000009
Application 14/326,590
Technology Center 1700

Before DONNA M. PRAISS, CHRISTOPHER L. OGDEN, and
JANE E. INGLESE, *Administrative Patent Judges*.

PRAISS, *Administrative Patent Judge*.

DECISION ON APPEAL¹

Pursuant to 35 U.S.C. § 134(a), Appellant² appeals from the Examiner's decision to reject claims 1, 7, 9–12, 15–18, 21, and 23. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ In this Decision, we refer to the Specification filed July 9, 2014 (“Spec.”), the Non-Final Office Action dated Dec. 21, 2018 (“Non-Final Act.”), the Appeal Brief filed May 20, 2019 (“Appeal Br.”), the Examiner’s Answer dated July 30, 2019 (“Ans.”), and the Reply Brief filed Sept. 30, 2019 (“Reply Br.”).

² We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies LG CHEM LTD. as the real party in interest. Appeal Br. 2.

STATEMENT OF THE CASE

The subject matter on appeal relates to a mixed cathode active material having improved power characteristics and a lithium secondary battery including the same. Spec. ¶ 1. The mixed cathode active material is described as using LiFePO_4 (LFP) having a portion of iron (Fe) substituted with other elements, such as manganese (Mn), to prevent a rapid voltage drop in the transient region when layered-structure lithium transition metal oxide and olivine-structure lithium oxide (e.g. LFP) are blended. *Id.* Claim 1 is illustrative and reproduced from the Claims Appendix to the Appeal Brief.

1. A lithium secondary battery, comprising:

a cathode having a mixed cathode active material,
wherein the mixed cathode active material consists of:

a first cathode active material as layered-structure ternary lithium-containing metal oxide represented by Chemical Formula 1,

[Chemical Formula 1]



wherein in Chemical Formula 1,

$a=0$;

$0.5 \leq x \leq 0.6$;

$0.2 \leq y \leq 0.3$;

$0.1 \leq z \leq 0.3$; and

$x+y+z=1$; and

a second cathode active material as olivine-structured lithium phosphate represented by Chemical Formula 2,

[Chemical Formula 2]



wherein in Chemical Formula 2,

M is Mn;

M' is one or more elements selected from the group consisting of Cu, and Zn;

X is phosphorus (P);

$0.1 < x \leq 0.5$; and

$0 < y < 0.5$;

wherein the lithium secondary battery has a power that is stably maintained in a transient region ranging from about 20% to 40% state of charge (SOC) of the lithium secondary battery, and

wherein the second cathode active material is included in an amount of 5 parts by weight to 50 parts by weight based on 100 parts by weight of the mixed cathode active material.

ANALYSIS

We review the appealed rejections for error based upon the issues Appellant identifies, 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 argued claims and Appellant’s arguments, we are not persuaded of reversible error in the appealed rejections.

The Examiner rejects claims 1, 7, 9–12, 15–18, 21, and 23 as follows for the reasons provided in the Non-Final Office Action. Non-Final Act. 3–9.

Claims Rejected	35 U.S.C. §	References/Basis
1, 7, 9, 10, 15, 16, 21, 23	103(a)	Kojima, ³ Paulsen, ⁴ Goto ⁵
11, 12	103(a)	Kojima, Paulsen, Goto, Takami ⁶
17, 18	103(a)	Kojima, Paulsen, Goto, EP, ⁷ Rye ⁸

Appellant does not separately argue the rejections or rejected claims. Appeal Br. 5–13. Accordingly, we select claim 1 as representative and, in the absence of arguments directed to the subsidiary rejections, claims 7, 9–12, 15–18, 21, and 23 will stand or fall with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv).

Appellant contends the Examiner erred in rejecting claim 1 over the combination of Kojima, Paulsen, and Goto because (1) Kojima’s lithium secondary battery comprises a mixed cathode material that is a mixture of materials that the invention avoids, (2) Paulsen teaches disadvantages of LNMO over LMNCO that would lead a skilled artisan away from using untreated LNMO, (3) Goto does not recognize the problem of rapid voltage drop in a transient region, using $\text{LiFe}_{1-x-y}\text{MxM}'_y\text{XO}_4$ instead to improve electron conductivity, and (4) a skilled artisan would not have known if the

³ JP 2007-250299, published Sept. 27, 2007. Citations herein are to the machine translation made of record on Dec. 9, 2014.

⁴ WO 2011/054440 A1, published May 12, 2011.

⁵ JP 2004-063422, published Feb. 26, 2004. Citations herein are to the machine translation made of record on Dec. 21, 2018.

⁶ US 2010/0248038 A1, published Sept. 30, 2010.

⁷ Electric Powertrains, MIT Electric Vehicle Team (Apr. 2008).

⁸ Court Rye, Clean Care Comparison: Hybrid Series, Parallel, Plug-In and EV (Sept. 5, 2011).

combination of active materials taught in Paulsen and Goto would work in the ratio claimed. Appeal Br. 6–13.

Appellant’s arguments do not persuade us that the Examiner reversibly erred in rejecting the claims over the combination of Kojima, Paulsen, and Goto. Appellant does not dispute that Kojima discloses a lithium secondary battery comprising a mixed cathode active material. Appeal Br. 6. Thus Kojima is directed to the same general subject matter as Appellant’s device. Spec. ¶ 1 (“The present invention relates to a mixed cathode active material having improved power characteristics and a lithium secondary battering including the same”). Appellant’s argument that Kojima’s mixed cathode active material is the mixture that the claimed invention avoids does not render the prior art reference non-analogous art or otherwise irrelevant to a patentability analysis simply because the Examiner’s combination modifies Kojima’s device.

Appellant’s assertion that modification of Kojima would decrease the difference between operating voltage of the two materials used and therefore change its principle of operation (*id.* at 6–9) is unpersuasive because Kojima’s modified device would still have a difference between operating voltage of the two materials. Appellant’s position is that modification of Kojima’s mixed cathode active material would “decrease the difference between operating voltage of [the] two materials” (Appeal Br. 9), however, Appellant does not adequately support its argument that modification of this difference would change Kojima’s principle of operation. As the Examiner notes (Ans. 13), Appellant’s argument that the voltage drop of the modified mixed cathode active material cannot be (or is too small to be) detected by Kojima’s battery is not supported by objective evidence. Even if the

Examiner erred in identifying the flat regions in comparing Kojima's charge-discharge curve and Appellant's Figure 1 representing modified Kojima's charge-discharge curve, we find this error to be harmless because Appellant does not direct us to any evidence in the cited appeal record to support the voltage drop being inadequate for Kojima's purpose.

Appellant's argument (Appeal Br. 9–11) that Paulsen discourages a skilled artisan from using untreated LNMO as claimed on the basis that Paulsen discloses disadvantages of untreated LNMO compared to treated LNMO is not persuasive because treated LNMO is one way of decreasing the moisture sensitivity of LNMO that Paulsen identifies. Paulsen 2:28–3:5. A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). That treating LNMO provides the benefit taught by Paulsen does not negate the advantages of LNMO that Paulsen also discloses. *See Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) (“The fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another.”).

The record supports the Examiner's finding LNMO as compared to Kojima's LMNCO materials has a much higher intrinsic capacity and lower tendency to react with electrolyte at elevated temperature due to Mn dissolution. Ans. 3–4; Paulsen 2:24–26. Therefore, we find no error in the

Examiner's modification of Kojima's LMNCO materials with Paulsen's teaching that LNMO provides a benefit.

Appellant's argument (Appeal Br. 12) that Kojima and Paulsen do not recognize the problems caused by combining LiFePO_4 and $\text{Li}_{1+a}\text{Ni}_x\text{Co}_y\text{Mn}_{1-x-y}\text{O}_2$ is not persuasive of error. "In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls." *KSR Int'l v. Teleflex Inc.*, 550 US 398, 419 (2007). The Examiner provides a sufficient reason for modifying Kojima's device with the teachings of Paulsen and Goto. *See* Ans. 14 (finding modification of Kojima's material with LNMO for the reason of achieving higher capacity and less electrolyte reactions at elevated temperatures from Mn dissolution and modification of Kojima's phosphate material with Goto to improve conductivity). It is not necessary that the reasons provided by the Examiner and supported by the cited prior art references match that of the inventor.

Appellant's argument (Appeal Br. 13) that the Examiner's combination of active materials lacks a reasonable expectation of success because the lithium battery art is unpredictable is unpersuasive of error because it is not supported by evidence. It is well settled that arguments of counsel cannot take the place of factually supported objective evidence. *See, e.g., Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1043 (Fed. Cir. 2017) ("Attorney argument is not evidence."); *In re Huang*, 100 F.3d 135, 139–40 (Fed. Cir. 1996); *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984).

The preponderance of the evidence in this appeal record, therefore, supports the Examiner's conclusion that the claimed subject matter would

have been obvious over Kojima as modified by Paulsen and Goto.

Accordingly, we sustain the Examiner's rejection of claim 1 under 35 U.S.C. § 103(a) for the above reasons and those expressed in the Answer, including the Response to Argument section.

TIME PERIOD FOR RESPONSE

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)(iv).

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	References/Basis	Affirmed	Reversed
1, 7, 9, 10, 15, 16, 21, 23	103(a)	Kojima, Paulsen, Goto	1, 7, 9, 10, 15, 16, 21, 23	
11, 12	103(a)	Kojima, Paulsen, Goto, Takami	11, 12	
17, 18	103(a)	Kojima, Paulsen, Goto, EP, Rye	17, 18	
Overall Outcome			1, 7, 9–12, 15–18, 21, 23	

AFFIRMED