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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KATHERINE JOANN HARRY and
HANY BASAM EITOUNI

Appeal 2022-003109
Application 16/218,416
Technology Center 1700

Before JAMES C. HOUSEL, WHITNEY W. WILSON, and
SHELDON M. McGEE, *Administrative Patent Judges.*

McGEE, *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 4–8 and 14–31. We have jurisdiction. 35 U.S.C. § 6(b).

We reverse.

[1] "Appellant" refers to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Robert Bosch GMBH. Appeal Br. 1.

CLAIMED SUBJECT MATTER

The claims are directed to composite organic-ceramic electrolytes that are said to be used in battery technology. Spec. ¶¶ 2–3.

Of the appealed claims, independent claims 14 and 24 are illustrative of the claimed subject matter and are reproduced below:

14. A composite organic-ceramic electrolyte, comprising:
an organic electrolyte; and
core/shell particles dispersed throughout the organic electrolyte;
wherein the core/shell particles comprise:
a core formed of a lithium lanthanum titanate compound described by a formula $Li_{3x}La_{(2/3)-x}TiO_3$ where $0.02 < x < 0.30$; and
a shell of a titanium nitride compound around the core.

24. A composite organic-ceramic electrolyte, comprising:
an organic electrolyte; and
core/shell particles dispersed throughout the organic electrolyte;
wherein the core/shell particles comprise:
a core formed of a lithium lanthanum titanate compound described by a formula $Li_{3x}La_{(2/3)-x}TiO_3$ where $0.02 < x < 0.30$; and
a shell of a nitrogen-doped region.

REFERENCES

Name	Reference	Date
Roumi	US 2013/0224632 A1	August 29, 2013
Nakashima	US 2015/0180050 A1	June 25, 2015
Kim	US 2017/0222262 A1	August 3, 2017
Esaki	US 2018/0219224 A1	August 2, 2018

REJECTIONS

The Examiner maintains the following rejections on appeal:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis
4–8, 14–18, 24–31	103	Kim, Nakashima, Esaki
19–23	103	Kim, Nakashima, Esaki, Roumi

OPINION

The dispositive issue in this appeal is whether the Examiner's finding that Nakashima's sintering process would inherently result in the claimed "core/shell particles" is supported by a preponderance of factual evidence. We answer this question in the negative and reverse the rejections.

Our reviewing court has "recognized that inherency may supply a missing claim limitation in an obviousness analysis." *PAR Pharm., Inc. v. TWI Pharms, Inc.*, 773 F.3d 1186, 1194–95 (Fed. Cir. 2014). "[T]o rely on inherency to establish the existence of a claim limitation in the prior art in an obviousness analysis[,] the limitation at issue necessarily must be present, or the natural result of the combination of elements explicitly disclosed by the prior art." *Id.* at 1195–96. Furthermore, to properly rely on the doctrine of inherency, "the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex Parte Levy*, 17 USPQ2d 1461, 1464 (BPAI 1990). Once the Examiner so provides, the burden then shifts to the patent applicant to demonstrate otherwise. *See In re Best*, 562 F.2d 1252, 1255 (CCPA 1977).

Here, the Examiner finds that Kim teaches the subject matter of claims 14 and 24, noting that the particles are "lithium lanthanum titanate LLT[2] particles," except that "Kim does not expressly teach wherein the particles comprise a core formed of type $Li_{3x}La_{(2/3)-x}TiO_3$ type LLT and a shell of i) titanium nitride or ii) nitrogen doped LLT." Final Act. 3. In other words, the Examiner finds that the core/shell structure of the claimed particles is not taught by Kim.

To address these differences, the Examiner turns to Nakashima, which the Examiner finds teaches the specific LLT material of the claimed formula, along with a method of making such LLT. *Id.* The Examiner finds that it would have been obvious to use Nakashima's LLT in Kim's composite electrolyte, and that Nakashima's LLT would inherently form the claimed "core/shell particles" of the claims based on its disclosed process of manufacture, as evidenced by Appellant's Specification. *Id.* at 3–5 (citing Spec. ¶¶ 46, 69, 70). The Examiner also finds that the variables of sintering temperature and sintering time in Nakashima's process of making LLT are result-effective and that optimizing those variables to arrive at Nakashima's LLT would have been obvious. *Id.* at 4.

Appellant argues that the Examiner's inherency finding is unsupported because "Nakashima does not suggest the formation of the claimed shell." Appeal Br. 5. According to Appellant, "Nakashima does not disclose sintering core particles of lithium lanthanum titanate [but] [r]ather . . . specifically discloses sintering a formed, raw material mixture of titanium raw material, lithium raw material, and other metal raw material."

[2] We observe that in this appeal, lithium lanthanum titanate is interchangeably referred to as LLTO (Spec. ¶ 46) and as LLT by the Examiner (Final Act. 3).

Appeal Br. 6 (citing Nakashima ¶¶ 39–42, claim 9). Appellant also argues that the differences between Appellant's process of sintering lithium lanthanum titanate particles and Nakashima's process of sintering raw materials containing lithium and titantium "is not reconciled through the optimization of results effective variables." *Id.*

We agree with Appellant. The Specification disclosure relied on by the Examiner states that "a core particle of *lithium lanthanum titanate* (LLTO) is *sintered in nitrogen*, which produces either a nitrogen-doped LLTO shell or a shell of another phase such as TiN." Spec. ¶ 46 (emphases added). Thus, the Specification teaches that the lithium lanthanum titanate *itself* is subject to sintering in a nitrogen atmosphere in order to produce a nitrogen-doped or TiN shell. *Id.* The Nakashima reference relied on by the Examiner, however, does not sinter the lithium lanthanum titanate in a nitrogen atmosphere; rather, the lithium lanthanum titanate is the apparent *result* of sintering a raw material powder comprising materials such as "titanium raw material," "lithium raw material," and "lanthanum raw material." Nakashima ¶¶ 33 (identifying the raw material components), 36 (describing mixing those raw materials), 39 (describing "provisional baking of the raw material powder" in an inert gas atmosphere such as nitrogen or argon gas), 40 (describing optional pulverization of the provisional baked powder), 41 (describing forming the provisionally baked powder into a desired shape), 42 ("[t]he formed material obtained is sintered so as to obtain lithium-lanthanum-titanium oxide"), 80 (Example 1 description of primary sintering "under an atmosphere, and then, secondary sintering . . . so as to obtain a lithium-lanthanum-titanium oxide sintered material."). Thus, there is insufficient factual evidence contained within Nakashima that a core

particle of lithium-lanthanum-titanate is sintered in a nitrogen atmosphere in order to form the shell claimed in either claim 14 or 24.

Under these circumstances, we do not sustain the appealed rejections.

CONCLUSION

The Examiner's rejections are reversed.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference(s) / Basis	Affirmed	Reversed
4–8, 14–18, 24–31	103	Kim, Nakashima, Esaki		4–8, 14–18, 24–31
19–23	103	Kim, Nakashima, Esaki, Roumi		19–23
4–8, 14–31				4–8, 14–31

REVERSED