



# 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.
13/522,744	07/18/2012	Hiroki Nagai	11139.0076-00000	7245
22852	7590	02/21/2018	EXAMINER	
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			GATEWOOD, DANIEL S	
			ART UNIT	PAPER NUMBER
			1729	
			NOTIFICATION DATE	DELIVERY MODE
			02/21/2018	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):

regional-desk@finnegan.com

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

*Ex parte* HIROKI NAGAI, MAASAHIRO MORITA, and  
YUKIHIRO OKADA

---

Appeal 2017-005740  
Application 13/522,744<sup>1</sup>  
Technology Center 1700

---

Before KAREN M. HASTINGS, CHRISTOPHER L. OGDEN, and  
MICHAEL G. MCMANUS, *Administrative Patent Judges*.

HASTINGS, *Administrative Patent Judge*

DECISION ON APPEAL

Appellants seek our review under 35 U.S.C. § 134(a) of the Examiner's decision rejecting claims 1, 2, 4–7, and 11–14 under 35 U.S.C. § 103(a) as being unpatentable over at least Shizuka (WO 2009/031619 A1, pub. Mar. 12, 2009; relying upon Shizuka et al. 771 (US 2010/0209771 A1, pub. Aug. 19, 2010) as its English translation).<sup>2</sup>

---

<sup>1</sup> Appellants identify the real party in interest as Toyota Jidosha Kabushiki Kaisha (Appeal Br. 4).

<sup>2</sup> The Examiner additionally applied Shizuka 695 (WO 2008/078695 A1 pub. July 3, 2008) relying on Shizuka et al. 200 (US 2011/0003200 A1 pub. Jan. 6, 2011) as its English translation) to dependent claim 12 (Final Action 10; Ans. 6). All paragraph references herein are to the English translation documents.

We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We AFFIRM.

Independent claim 1 is illustrative of the subject matter on appeal  
(emphasis added):

1. A lithium secondary battery comprising  
a positive electrode;  
a positive electrode collector; and  
a positive electrode mix layer on a surface of the  
collector; wherein  
the positive electrode mix layer includes a positive  
electrode active material and a conductive material,  
the positive electrode active material is a lithium-nickel  
complex oxide including oxides of lithium (Li) and nickel (Ni)  
as constituent metal elements,  
the positive electrode mix layer has two peaks, large and  
small, of differential pore volume over a pore size ranging from  
0.01  $\mu\text{m}$  to 10 $\mu\text{m}$ , in a pore distribution curve measured by a  
mercury porosimeter, and  
from among the large and small peaks, a pore size in a  
smaller peak B of the differential pore volume is smaller than a  
pore size in a larger peak A of the differential pore volume, and  
*in the pore distribution curve, a total pore volume per  
unit mass of the conductive material for pores having a pore  
size smaller than a pore size P of a minimum value between the  
large and small peaks and encompassing the smaller peak B  
satisfies a range of 0.18 cm<sup>3</sup>/g to 0.8 cm<sup>3</sup>/g.*

Appellants' arguments focus solely on claim 1 (Appeal Br. 9–17).  
Appellants also do not present arguments to separately rejected dependent  
claim 12 (Appeal Br. 17). Thus, all the claims stand or fall with claim 1.

## ANALYSIS

We have reviewed each of Appellants' arguments for patentability. However, we determine that a preponderance of the evidence supports the Examiner's conclusion that the claimed subject matter is unpatentable within the meaning of § 103 in view of the applied prior art. Appellants' arguments do not show error in the Examiner's obviousness determination. Accordingly, we will sustain the Examiner's § 103 rejections, and we add the following primarily for emphasis.

It has been established that "the [obviousness] analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007); *see also In re Fritch*, 972 F.2d 1260, 1264–65 (Fed. Cir. 1992) (a reference stands for all of the specific teachings thereof as well as the inferences one of ordinary skill in the art would have reasonably been expected to draw therefrom).

Appellants' principal arguments are that Shizuka's disclosure of a pore distribution curve (e.g., Fig. 61) is directed to a lithium transition metal-based compound powder *per se* and not to the positive electrode mix layer (of powder and a conductive material) on a surface of a collector, and that any reliance on inherency is improper since various factors may impact the pore distribution of the mix layer (Appeal Br. 10–16; Reply Br. 2–11). Even assuming *arguendo* that Appellants are correct that the pore distribution discussed in Shizuka is with respect to the lithium-nickel complex oxide powder *per se*, Appellants' arguments are unpersuasive of error in the Examiner's rejection.

Shizuka is directed to the importance of having a main peak and a subpeak of differential pore volume in the material used in the electrode mix layer, and discusses how the pore distribution impacts the battery operation, i.e. its capacity and load characteristics (Shizuka, e.g., ¶¶ 295, 301, 303, 483, 485). One of ordinary level of skill in the art would have readily inferred from at least these disclosures in Shizuka that the pore distribution of the mix layer containing the powder on the electrode is a result effective variable. “A recognition in the prior art that a property is affected by the variable is sufficient to find the variable result-effective.” *In re Applied Materials, Inc.*, 692 F.3d 1289, 1297 (Fed. Cir. 2012). It is well settled that it would have been obvious for an artisan with ordinary skill to develop workable or even optimum ranges for result-effective parameters. *In re Woodruff*, 919 F.2d 1575, 1577 (Fed. Cir. 1990); *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980); *In re Aller*, 220 F.2d 454, 456 (CCPA 1955). Indeed, the ranges disclosed in Shizuka for pore volume of the subpeak overlap the claimed range (Shizuka ¶ 485).<sup>3</sup> Accordingly, a preponderance of the evidence supports the Examiner’s determination that the subject matter of claim 1 is unpatentable over Shizuka.

Appellants also argue there is no evidence in the record, other than in Appellants’ disclosure, that Shizuka “recognize[s] the problems pertinent to high-rate charge and discharge cycles in rechargeable batteries” and thus there is no motivation to adjust a pore distribution of the positive electrode

---

<sup>3</sup> While the Examiner relied upon Shizuka 695 for dependent claim 12, similar disclosure is found in Shizuka regarding the effect of pore size on battery capacity and load characteristics (*compare*, Shizuka 695 ¶¶ 211, 215 to Shizuka ¶¶ 483, 485). The ranges for subpeak pore distributions of Shizuka 695 ¶ 215 similarly overlap the claimed range.

mix layer (Appeal Br. 16, 17). The problem faced by an applicant is a relevant factor to take into consideration in an obviousness determination. However, an invention may be obvious for reasons the inventor did not contemplate. *See In re Dillon*, 919 F.2d 688, 693 (Fed. Cir. 1990) (en banc) (“In particular, the statement [in *In re Wright*] that a *prima facie* obviousness rejection is not supported if no reference shows or suggests the newly-discovered properties and results of a claimed structure is not the law.”) (overruling-in-part *In re Wright*, 848 F.2d 1216 (Fed. Cir. 1988)). As discussed above, Shizuka recognizes the impact that pore size distribution of the electrode material has on battery operation. Appellants do not direct us to objective evidence of any secondary considerations, such as unexpected results, in support of nonobviousness. *Dillon*, 919 F.2d at 692 (explaining that where the prior art gives reason or motivation to make the claimed invention, the burden and opportunity to produce evidence such as unexpected results then falls on an applicant to rebut that *prima facie* case). *See also Boesch*, 617 F.2d 276 (“[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art.”)

As a result, a preponderance of the evidence in the record supports the Examiner’s rejection of claim 1. Appellants’ arguments do not identify a reversible error in the Examiner’s rejection. Appellants do not argue any of the claims separately from claim 1 (Appeal Br. 17).

Accordingly, the Examiner’s § 103 rejections on appeal are affirmed.

#### DECISION

The Examiner’s decision is affirmed.

Appeal 2017-005740  
Application 13/522,744

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