

The opinion in support of the decision being entered today is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte SEIMEI USHIRO  
NAOYUKI NISHINO, and YOSHIHIRO ITO

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Appeal 2007-1944  
Application 10/631,894<sup>1</sup>  
Technology Center 1700

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Decided: 27 August 2007

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Before TEDDY S. GRON, CAROL A SPIEGEL, and MARK NAGUMO,  
*Administrative Patent Judges.*

NAGUMO, *Administrative Patent Judge.*

DECISION ON APPEAL

**A. Introduction**

Applicants ("Ushiro") appeal under 35 U.S.C. § 134 from the final rejection of claims 25–29 and 51–59, all of the pending claims, as obvious

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<sup>1</sup> Application filed 1 August 2003. The benefit of priority under 35 U.S.C. § 119 is claimed to 2 August 2002 and to 31 March 2003. The real-party-in-interest is listed as Fuji Photo Film Co., Ltd. of Japan. (Brief filed 7 June 2006 ("Br."), at 2.)

under 35 U.S.C. § 103 over various references.<sup>2</sup> We have jurisdiction under 35 U.S.C. § 6(b). We AFFIRM.

The claimed subject matter relates to various combinations of a fuel cell, a "fuel cell system," and in some embodiments, a portable device powered by the fuel cell and system. According to Ushiro, a critical portion of the fuel cell system is a secondary cell that is disposed adjacent to the fuel cell. (Br. at 3.)

Claim 25 is illustrative of the issues necessary to resolve this appeal and reads as follows:

A camera including

a solution supply port for a fuel electrode of a fuel cell  
and

a solution discharge port for an air electrode of the fuel  
cell,

the camera comprising,

a fuel cell; and

a fuel cell system, including

a fuel storing section for storing fuel for generating  
power by the fuel cell,

formed with a flexible sheet member, which  
at least a part thereof is deformable,

a fuel supply port, which is

provided at the fuel storing section, and is  
detachably connected to the solution supply  
port of the fuel electrode of the fuel cell, and

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<sup>2</sup> The Examiner has withdrawn a rejection of claims 25, 26, 28, and 51 under 35 U.S.C. § 112(1), for lack of enablement. (Examiner's Answer mailed 24 August 2006 ("Answer"), at 2.)

a secondary cell which stores power generated by  
the fuel cell,  
wherein the fuel cell system is disposed at a side of a lens  
of the camera, and  
the secondary cell is disposed adjacent to the fuel cell.

(Br. at 15; paragraphing, indentation, and italics added.)

Independent claims 26 and 28 are similar, but are drawn to a portable telephone and a portable terminal, respectively. Independent claim 51 is drawn to a fuel cell system largely as recited in claim 25, but the flexible sheet member is not recited. Claims 52–56 depend from claim 51.

The Examiner relies on the following prior art as evidence of unpatentability:

Prasad	U.S. 2003/0,082,427 A1	May 1, 2003
Ohtani	U.S. 6,118,949	Sep. 12, 2000
Peterson	U.S. 3,439,596	Apr. 22, 1969
Shioya	U.S. 6,916,565 B2	Jul. 12, 2005
Lonka	U.S. 6,308,084 B1	Oct. 23, 2001
Bateman	U.S. 5,909,818	Jun. 8, 1999
Faris	U.S. 6,558,825 B1	May 6, 2003

## **B. Findings of Fact**

The following findings of fact and any set out in the Discussion are supported by a preponderance of the evidence of record. To the extent any finding of fact is a conclusion of law, it should be treated as such.

Ushiro's Disclosure

1. According to Ushiro, a number of problems confront the use of prior art fuel cells with portable devices such as electronic cameras, including inefficient use of the continuously generated power (Specification at 1 and 3), leakage of water and other waste products of the fuel cell (*id.* at 2), and freezing of the water in cold climates (*id.* at 3).
2. Ushiro seeks exclusionary patent protection for a fuel cell system that is said to overcome these and other problems. (Specification at 3.)
3. The fuel cell system is claimed separately and in combination with various electronic devices.
4. To ameliorate the inefficient use of fuel cell generated energy, Ushiro provides a first aspect of the invention wherein, among other features, "a secondary cell which stores power generated by the fuel cell is installed." (Specification at 3–4.)
5. According to Ushiro, the secondary cell makes it possible to allow the fuel cell to generate power "only when the power of the secondary cell is insufficient." (Specification at 5.)
6. To address the leakage problem, Ushiro provides a discharge-solution recovery port that leads to a discharged-solution storing section that shares space with the fuel storage section via a deformable flexible sheet member. (Specification at 4.) As the fuel is used up, it takes up less space, which the discharged water and other materials occupy, separated from the fuel by the deformable sheet member. (*Id.* at 4–5.)



10. The fuel supply **10** comprises two compartments, a fuel storing section **68** and a discharged-solution storing section **70**, which are separated by a flexible sheet material **66**. (Specification at 20.)

11. Starting in fuel supply unit **10**, the fuel leaves fuel storing section **68** via fuel supply port **74**, which is coupled to solution supply port **52**, which leads to fuel tank **40** of the fuel cell **12**. (Specification at 19.)

12. The discharged solution collected in air tank **42** is removed via solution discharge port **54**, which is coupled to discharged-solution recovery port **76**, which feeds discharged-solution section **70** of the fuel pack **10**. (Specification at 19.)

13. The most detailed description of the secondary cell is given in the description of Figure 4, which reads in part:

the secondary cell **28** including the circuit of the converter **30** may be disposed at the cap **72** of the fuel pack **10**, with terminals **31**, which are connected to the fuel electrode **46** and the air electrode **48** . . . disposed at receiving base **15** of the fuel cell **12**. In this case, when the fuel pack **10** is attached to the fuel cell **12**, the terminals **31** are connected to the secondary cell **28**.

(Specification at 23.)

14. There appear to be no other disclosures in the specification, the figures, the original claims, or the abstract that relate to the relative physical disposition of the secondary cell and the fuel cell.

15. Ushiro does not describe any other embodiments of the invention in as much detail as the camera, stating that "the invention can be applicable to other portable devices and portable terminals," including a portable telephone provided with a camera, in which the fuel pack and fuel cell may

be placed on the side of the keyboard box of the telephone. (Specification at 29.)

Prasad<sup>4</sup>

16. Prasad describes a "fuel supply configured to be removably coupled to a fuel cell to power a portable electronic device." (Prasad at 1, ¶ 20.)

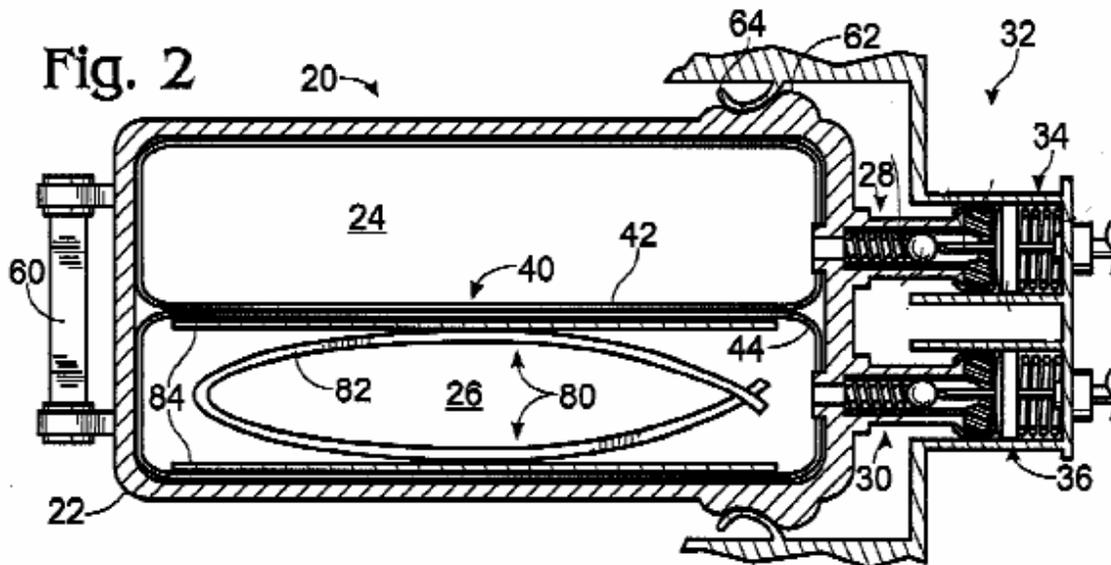
17. According to Prasad, "it will be appreciated that a fuel supply according to the present invention may be used in connection with a wide range of devices, such as personal digital assistants, palm devices . . . etc." (Prasad at 2, ¶ 20.)

18. Referring to Figure 1, which shows a laptop computer equipped with the fuel cell and fuel supply immediately in front of the keyboard area, Prasad also states that, "while fuel cell **12** is shown positioned next to fuel supply **20** in electronic device **10**, it will be appreciated that the fuel cell may be positioned in any other desired relation to the fuel supply." (Prasad at 2, ¶ 20.)

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<sup>4</sup> Ravi Prasad et al., U.S. 2003/0,082,427 A1, "Fuel Supply for a Fuel Cell," published 1 May 2003.

19. Figure 2 of Prasad, which illustrates a fuel supply according to Prasad's invention, is shown below:



{ Prasad Figure 2 is said to show a fuel supply. }

20. Referring to Figure 2, Prasad describes:

an outer container 22 that encloses a fuel storage area 24 . . . and a waste storage area 26 . . . Fuel solution is passed from fuel storage area 24 to the fuel cell through a fuel solution outlet 28, and waste is passed into waste storage area 26 through a waste inlet 30.

(Prasad at 2, ¶ 21.)

21. Prasad teaches further that "[f]uel solution outlet 28 and waste inlet 30 are configured to be coupled to complementary connectors 34 and 36 within receptacle 32 to connect fuel storage area 24 and waste storage area 26 to fuel cell 12." (Prasad at 3-4, ¶ 36.)

22. Prasad also describes "[a] movable barrier or divider, indicated generally at 40 in FIGS. 2-4, [which] separates fuel storage area 24 and waste storage area 26." (Prasad at 2, ¶ 26.)

23. According to Prasad, "[i]n the embodiment depicted in FIGS. 2–4, barrier **40** includes a first flexible inner container **42** surrounding fuel storage area **24**, and a second flexible inner container **44** surrounding waste storage area **26**." (Prasad at 2, ¶ 27.)

24. Prasad teaches that the flexible containers **42** and **44** "may be made of any suitable material." (Prasad at 2, ¶ 28.)

Shioya<sup>5</sup>

25. Shioya teaches power supply systems for portable devices such as a mobile phone or personal digital assistant. (Shioya at 3:18–20.)

26. Shioya describes the power supply as operating in embodiments with an exchangeable fuel cell. (Shioya at, e.g., 4:46–60.)

27. Shioya describes a particular embodiment in which a power generation device **181** (fuel cell) includes "a charge storage portion **182** which stores a part of the electric power generated by the power generation device **181** and consists of a secondary cell, a capacitor or the like." (Shioya at 22:44–47, citing figure 12.)

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<sup>5</sup> Masaharu Shioya, U.S. Patent 6,916,565 B2, issued 12 July 2005 from application 10/023,269, filed 18 December 2001, titled "Power supply System, Fuel Pack Constituting the System, and Device Driven by Power Generator and Power Supply System."

Ohtani<sup>6</sup>

28. Ohtani, Figure 4, shows a camera with a battery pack **50** accessible by a coin-screw part **51** next to the lens at the end of the line labeled **40** (indicating the camera as a whole). (Ohtani at 6:26-30.)

Peterson<sup>7</sup>

29. Peterson, Figure 3, shows a camera having a removable battery clip **56** next to the lens **19**. (Peterson at 2:30 and 3:28.)

The Rejections

The Examiner maintains the following rejections:

30. Claim 25 is rejected under 35 U.S.C. § 103(a) over the combined teachings of Prasad, Ohtani, Peterson, and Shioya. (Answer at 3.)

31. Claims 26 and 27 are rejected under 35 U.S.C. § 103(a) over the combined teachings of Prasad, Shioya, and Lonka. (Answer at 5.)

32. Claim 28 is rejected under 35 U.S.C. § 103(a) over the combined teachings of Prasad and Shioya. (Answer at 7.)

33. Claims 51, 52, and 55–57 are rejected under 35 U.S.C. § 103(a) over the combined teachings of Prasad and Shioya. (Answer at 7.)

34. Claims 53 and 54 are rejected under 35 U.S.C. § 103(a) over the combined teachings of Prasad, Shioya, and Bateman. (Answer at 9.)

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<sup>6</sup> Tadasu Ohtani, U.S. Patent 6,118,949, issued 12 September 2000, titled "Accessory and Motor Drive Device for Camera, and Camera System."

<sup>7</sup> Dean M. Peterson et al., U.S. Patent 3,439,596, issued 22 April 1969, titled "Retractable Lens Camera with Automatic Exposure Control System and Battery Preserving Switch."

35. Claim 58 is rejected under 35 U.S.C. § 103(a) over the combined teachings of Prasad, Shioya, and Faris. (Answer at 9.)

36. Claim 59 is rejected under 35 U.S.C. § 103(a) over the combined teachings of Prasad, Shioya, and Faris. (Answer at 10.)

37. The Examiner finds that Prasad teaches all of the elements of the claimed subject matter but for the presence of a secondary cell and the fuel cell being at the side of the lens of a camera, as required by claim 25, or in the keyboard section of a portable telephone, as required by claims 26 and 27. (Answer at 4ff, citing Prasad at ¶¶ 20-36 and Figures 2, 3, and 10-12.)

38. The Examiner also finds that Prasad does not teach placing a secondary cell adjacent to the fuel cell. (Answer at 4ff.)

39. The Examiner finds that Shioya teaches a power supply system (a battery clip) in which a secondary cell is charged by a fuel cell in order to improve energy utilization. (Answer at 4, citing Shioya at 22:35–50 and Figure 12.)

40. The Examiner finds that Ohtani Figure 4 and Peterson Figure 3 illustrate that placement of a power supply system in a camera at a side of a lens is conventional. (Answer at 5; see also the Final Rejection, mailed 9 December 2005, at 4.)

41. The Examiner concludes that it would have been obvious for one of ordinary skill in the art to use a secondary cell in combination with the fuel cell systems disclosed by Prasad in order to gain the advantages taught by Shioya; that the placement of the fuel cell system at a side of a lens would have been obvious because it was known to be conventional in cameras, as

shown by Ohtani and Peterson; and that the placement of the secondary cell adjacent to the fuel cell in a portable device would have been a matter of design choice and rearrangement of known parts involving only routine skill. (Answer at 5 (claim 25), at 6 (claims 26, 27), at 7 (claim 28), and at 8–9 (claims 51, 52, and 55-57).)

42. Ushiro finds that Ohtani and Peterson are not directed to power supplies utilizing a fuel cell and complains that fuel cells "are not even mentioned in the body of the rejection." (Br. at 10.)

43. Otherwise, Ushiro does not contest the Examiner's findings about the disclosures of the references.

44. Ushiro disagrees with the Examiner's conclusions as to all one of ordinary skill would have drawn from the references.

45. In particular, Ushiro argues that there is no teaching or suggestion to place the secondary cell adjacent to the fuel cell (Br. at 9 (claim 25); at 11 (claims 26, 27); and at 12–13 (claims 28, 51, 52, and 55–57).)

46. Ushiro argues that the Examiner's reliance on a theory of "design choice" is flawed because, absent "particular findings" regarding reasons for the recited placement, an evidentiary basis for the rejection is inadequate. (Br. at 9–10.)

47. Thus, according to Ushiro, all the Examiner's rejections should be reversed. (Br. at 10, 11, 12, 13, and 14.)

48. Additionally, Ushiro argues that neither Prasad nor Shioya teaches or suggests placing the fuel cell system at a side of the lens of a camera. (Br. at 8.) Ushiro concludes that the Examiner's rejection of claim 25 should be reversed for that reason as well. (*Id.*)

49. Ushiro does not challenge the Examiner's findings regarding any of the other references, nor does Ushiro challenge the Examiner's conclusion of obviousness based on the combination of references except to argue that the additional references do not make up for the alleged deficiencies of Prasad and Shioya. (*See Br.* at 11 (claim 26), at 13 (claims 52 and 55–57; claims 53, 54; claim 58), and at 14 (claim 59).)

50. Accordingly, we do not find it necessary to describe Lonka, Bateman, or Faris, or to discuss the Examiner's findings regarding these references.

### **C. Discussion**

Obviousness is a legal conclusion based on underlying findings of fact. *E.g., In re Kahn*, 441 F.3d 977, 985, 78 USPQ2d 1329, 1334 (2006). The Supreme Court recently clarified the legal reasoning to be applied in the analysis of obviousness in *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 82 USPQ2d 1385 (2007), decided after briefing in this appeal was completed.

The Court emphasized that the question of obviousness is to be given "an expansive and flexible approach" with due attention to "any secondary considerations that would prove instructive." *KSR Int'l Co.*, 127 S.Ct. at 1739, 82 USPQ2d at 1395. The Court provided several indicia of potential obviousness. First, the Court observed that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* (emphasis added). Thus, "[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable

variation, § 103 likely bars its patentability." *Id.* at 1740, 82 USPQ2d at 1396, (emphasis added).

The Court explained that "[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed in the patent at issue."

*Id.* at 1740–41, 82 USPQ2d at 1396. The Court cautioned, however, that "[t]o facilitate review, this analysis should be made explicit. . . . As our precedents make clear, however, the 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." *Id.* at 1741, 82 USPQ2d at 1396.

The Court identified four errors in the analysis of the "teaching, suggestion, or motivation" ("TSM") test as applied by the court of appeals below, three of which are especially pertinent to the present case. First, the Court reminded the bar that "[a] person of ordinary skill is also a person of ordinary creativity, not an automaton." *KSR*, 127 S.Ct. at 1742, 82 USPQ2d at 1397. Second, the Court rejected the thesis that obviousness cannot be proved merely by showing that a combination of elements would have been "obvious to try." The Court instructed that "[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of

ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under § 103." *Id.*, emphasis added. The Court concluded by emphasizing the "expansive and flexible approach" mandated by its decisions, declaring, "[r]igid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it." *Id.* at 1742–43, 82 USPQ2d at 1397.)

The Court's repeated use of the terms "likely" and "might" emphasize that in any given case, there may be additional factors that may inform the obviousness analysis. If these factors are already of record and the examiner has failed to address them, it may not be necessary for the applicant to do more than point out those facts that the examiner overlooked or misapprehended and to explain why they outweigh the evidence favoring a conclusion of obviousness. On the other hand, it may be necessary to introduce evidence in support of the applicant's position. But it is clear that neither applicants nor the Board can rely on rigid rules insisting that specific evidence of "motivation" is required in every case.

With these principles in mind, on review of the briefing in this appeal, the dispositive issue is whether the Examiner established a sufficient basis for concluding that the positioning of the secondary cell taught by Shioya adjacent to the fuel cell in the fuel cell system taught by Prasad would have been obvious to one of ordinary skill in the art. A secondary but related issue is the obviousness of placing the fuel cell system next to a camera lens. Both the Examiner (Answer at 4–5) and Ushiro (Br. at 8) agree that neither Prasad nor Shioya teach a camera. Ushiro does not dispute that Ohtani and Peterson describe cameras having battery packs next to the lens, as the

Examiner found. Instead, Ushiro argues that the Examiner failed to identify any teaching or suggestion that would have motivated the placement of the secondary cell or the fuel cell assembly as recited in the claims. Moreover, Ushiro does not dispute the Examiner's findings as to the teachings of the references or the propriety of their combination on any other basis, and we deem all such arguments to have been waived.

Ushiro's arguments are without merit. First, Ushiro's complaint that the Examiner did not mention Ohtani or Peterson in the body of the final rejection (Br. at 10) is baseless. These references were cited by name and patent number in the heading of the rejection and cited by patent number in the body. (Final Rejection at 4; Answer at 5.) We find it difficult to credit any of Ushiro's factual findings in the face of these erroneous characterizations of the record. Substantively, Ushiro objects that neither Ohtani nor Peterson teach the use of fuel cells (Br. at 10); but Ushiro does not explain why this fact undermines the Examiner's position. Consideration of the record shows that Ushiro's objection is unwarranted.

First, as shown by Ohtani and Peterson (and equally susceptible of official notice), battery powered cameras with the batteries placed "at a side of a lens" are well known. We note in passing that the limitation "at the side of a lens" is not given any particular definition by Ushiro in its specification, and hence is given the broadest reasonable meaning in light of the specification. Second, as the Examiner found, both Prasad and Shioya are concerned with fuel cell systems for portable electronic devices such as those that have become commonplace in the last couple of decades. The practical and technical demands for compact, light weight, conveniently used telephones, personal data devices, cameras, and the like are undeniable

today. Moreover, environmental demands on such devices, particularly cold-weather demands, are well known outside of the colder climates thanks to the growing popularity, e.g., of winter and alpine sports.

The Examiner, when challenged as to the basis of the "design choice" argument with regard to the placement of the fuel cell system in the camera and with regard to the secondary cell "adjacent" to the fuel cell, responded by identifying engineering responses to the requirements for compact fuel-cell powered portable electrical devices. (Answer at 12–14.) Thus, both Ohtani and Peterson provide motivation to put the fuel cell system where it was known to place electrical power packs—indeed, in a small device such as a handheld camera, there are not too many places to put a power pack, and most of them would be reasonably described as being "at a side of a lens of the camera." Moreover, Prasad indicates that the positioning of the fuel cell system in a portable device is a matter well left to the decision of the ordinary designer. (FF 17; Prasad at 2, ¶ 20.) Similarly, Prasad and Shioya provide evidence that there were incentives to place a secondary cell close to the terminals of the fuel cell to minimize the size of the power pack and of the device as a whole. Denying that the present record supports the conclusion that a person of ordinary skill in the art lacked the ordinary creativity to place a secondary cell adjacent to the fuel cell terminals in a device intended to be compact and portable would reduce such a person to an automaton.

For all of these reasons, we conclude that the Examiner established a prima facie case of obviousness for the claimed subject matter, and that the burden was properly shifted to Ushiro to come forward with evidence of

"secondary considerations" supporting an ultimate conclusion of nonobviousness.

In the present case, Ushiro's vague arguments that the placement of the secondary cell adjacent to the fuel cell yields unexpected results are not persuasive. Evidence of obviousness must be weighed against evidence of nonobviousness. The problem is, Ushiro has not come forward with any evidence in support of its arguments. Moreover, in response to the rejections relying on further references, Ushiro did not argue substantively against the combinations, but rather urged only that the additional references did not cure the alleged deficiencies of Prasad and Shioya. As we find no such deficiencies, we AFFIRM all of the Examiner's rejections.

**D. Summary**

In view of the record and for the foregoing reasons, it is:

ORDERED that the rejection of claim 25 under 35 U.S.C. § 103(a) over the combined teachings of Prasad, Ohtani, Peterson, and Shioya is AFFIRMED;

FURTHER ORDERED that the rejection of claims 26 and 27 under 35 U.S.C. § 103(a) over the combined teachings of Prasad, Shioya, and Lonka is AFFIRMED;

FURTHER ORDERED that the rejection of claim 28 under 35 U.S.C. § 103(a) over the combined teachings of Prasad and Shioya is AFFIRMED;

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FURTHER ORDERED that the rejection of claims 51, 52, and 55–57 under 35 U.S.C. § 103(a) over the combined teachings of Prasad and Shioya is AFFIRMED;

FURTHER ORDERED that the rejection of claims 53 and 54 under 35 U.S.C. § 103(a) over the combined teachings of Prasad, Shioya, and Bateman is AFFIRMED;

FURTHER ORDERED that the rejection of claim 58 under 35 U.S.C. § 103(a) over the combined teachings of Prasad, Shioya, and Faris is AFFIRMED;

FURTHER ORDERED that the rejection of claim 59 under 35 U.S.C. § 103(a) over the combined teachings of Prasad, Shioya, and Faris is AFFIRMED; and

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

**AFFIRMED**

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