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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte PANKAJ SINGH and LAMON JONES

Appeal 2019-001316
Application 14/686,988
Technology Center 1700

Before GEORGE C. BEST, N. WHITNEY WILSON, and
JEFFREY R. SNAY, *Administrative Patent Judges*.

BEST, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1, 2, 4, 5, 9, 11–14, and 16 of Application 14/686,988. Final Act. (December 7, 2017). We have jurisdiction under 35 U.S.C. § 6.

For the reasons set forth below, we *affirm*.

¹ We use the word “Appellant” to refer to “Applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies Cabot Microelectronics Corp. as the real party in interest. Appeal Br. 1.

BACKGROUND

The '988 Application describes methods for the chemical-mechanical polishing (“CMP”) of molybdenum surfaces. Spec. ¶ 1. In particular, the Specification describes an aqueous suspension of abrasive particles that can be used as a CMP composition in the polishing of the molybdenum surface. *Id.* ¶¶ 2–5.

Claim 1 is representative of the '988 Application's claims and is reproduced below from the Claims Appendix of the Appeal Brief.

1. A chemical-mechanical polishing (CMP) method for polishing a molybdenum-containing substrate comprising the steps of:

(a) contacting a surface of the substrate with a polishing pad and an aqueous CMP composition comprising an aqueous carrier having a pH in the range of about 3 to about 6 and containing, at point of use:

(a) a particulate abrasive selected from the group consisting of a silica abrasive and an alumina abrasive, and wherein the abrasive has a positive zeta potential;

(b) a water soluble surface active material, wherein the surface active material is a cationic polymer; and

(c) an oxidizing agent;

and

(b) causing relative motion between the polishing pad and the substrate while maintaining a portion of the CMP composition in contact with the surface between the pad and the substrate for a time period sufficient to abrade at least a portion of the molybdenum from the substrate.

Appeal Br. 12 (indentation supplied).

REJECTIONS

On appeal, the Examiner maintains the following rejections:

1. Claim 14 is rejected under 35 U.S.C. § 112(b) as indefinite.
Answer 3–4.
2. Claims 1, 4, 5, and 13 are rejected under 35 U.S.C. § 103 as unpatentable over the combination of Yoshida,² Chen '608,³ and Grumbine.⁴ Answer 4–6.
3. Claims 2, 14, and 16 are rejected under 35 U.S.C. § 103 as unpatentable over the combination of Yoshida, Chen '608, Grumbine, and Kamiya.⁵ Answer 6–7.
4. Claims 9, 11, 12, 14, and 16 are rejected under 35 U.S.C. § 103 as unpatentable over the combination of Yoshida, Chen '608, Grumbine, and Dysard.⁶ Answer 7–8.
5. Claims 1, 4, 5, and 13 are rejected under 35 U.S.C. § 103 as unpatentable over the combination of Grumbine and Chen '608.
Answer 8–9.
6. Claims 2, 14, and 16 are rejected under 35 U.S.C. § 103 as unpatentable over the combination of Grumbine, Chen '608, and Kamiya. Answer 9–10.

² US 2005/0208883 A1, published September 22, 2005.

³ CN 102690608 A, published September 26, 2012. We rely upon the machine translation that is of record.

⁴ US 2007/0219104 A1, published September 20, 2007.

⁵ US 2009/0140199 A1, published June 4, 2009.

⁶ US 2009/0081871 A1, published March 26, 2009.

7. Claims 9, 11, 12, 14, and 16 are rejected under 35 U.S.C. § 103 as unpatentable over the combination of Grumbine, Chen '608, and Dysard. Answer 10–11.
8. Claims 1, 2, and 13⁷ are rejected under 35 U.S.C. § 103 as unpatentable over the combination of Chen '893⁸ and Kamiya. Answer 11.
9. Claims 4, 14, and 16 are rejected under 35 U.S.C. § 103 as unpatentable over the combination of Chen '893, Kamiya, and Grumbine. Answer 11–12.
10. Claims 9, 11, and 12 are rejected under 35 U.S.C. § 103 as unpatentable over the combination of Chen '893, Kamiya, Grumbine, and Dysard. Answer 12–13.

DISCUSSION

A. *Rejection of claim 14 as indefinite.*

The Examiner rejected claim 14 as indefinite. In particular, claim 14 recites, in pertinent part, “about 25 to about 5,000 ppm of a water-soluble surface active material.” The Examiner concluded that this phrase is indefinite because it does not specify the basis for the ratio “ppm.” Answer 3. Relying upon Wikipedia, the Examiner states that ppm may refer to a

⁷ Although the Answer includes claim 5 in its statement of this ground of rejection, *see* Answer 11, the Examiner has withdrawn the rejection of claim 5, *see id.* at 13.

⁸ CN 103265893 A, published August 28, 2013. We rely upon the machine translation that is of record.

weight fraction, mole fraction, or volume fraction. *Id.* The Examiner found that neither the Specification nor claim 14 resolves this ambiguity. *Id.*

Appellant argues that a person of ordinary skill in the relevant art would have understood that, in claim 14, ppm refers to parts per million on a weight basis. Appeal Br. 5. Appellant specifically argues that a CMP abrasive composition is a slurry of metal oxide abrasive in an aqueous carrier containing different chemical components. *Id.* For this reason, according to Appellant, the chemical components and the abrasive are expressed on a weight basis because expressing the concentration of components of a slurry as a volume or molar ratio would be counterintuitive. *Id.*

In response, the Examiner cites Lauer⁹ and Harris¹⁰ as describing the addition of components to a slurry to concentrations defined in terms of parts per million by volume of the slurry. Answer 13.

Appellant's Reply Brief only addresses Lauer, arguing that Lauer describes addition of an additive to a hydrocarbon slurry that precipitates suspended solids. Reply Br. 5. According to Appellant,

[p]recipitating suspended solids from bulk crude oil is a much different art than chemical-mechanical planarization slurries. The Examiner has used examples from non-analogous art to support an indefiniteness rejection. Appellants reassert that those skilled in the art would understand ppm as being on a weight basis, when the claim is read in light of the specification.

Id.

⁹ US 2002/0002320 A1, published January 3, 2002.

¹⁰ US 2010/0230325 A1, published September 16, 2010.

Appellant's argument is not persuasive. To begin with, it is not supported by citation to any evidence of record. As the Federal Circuit has explained, "[a]ttorney argument is not evidence." *Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1043 (Fed. Cir. 2017). Unsupported attorney argument is entitled to little or no weight.

The Examiner's position, however, is supported by citation to evidence demonstrating that a person of ordinary skill in the art would not necessarily have known that claim 14's use of the term ppm necessarily refers to use of the term on a weight basis rather than a volume basis.

Appellant's argument that Lauer is non-analogous art is not persuasive because Appellant has not presented us with any evidence showing that a person of ordinary skill in the art in the field of CMP compositions would use the term in a manner different from a person of ordinary skill in the art Lauer's technology. "[U]nsworn attorney argument . . . is not evidence and cannot rebut . . . other admitted evidence" *Gemtron Corp. v. St. Gobain Corp.*, 572 F.3d 1371, 1380 (Fed. Cir. 2009).

We, therefore, affirm the rejection of claim 14 as indefinite.

B. Rejection of claims 1, 4, 5, and 13 as unpatentable over the combination of Yoshida, Chen '608, and Grumbine.

Appellant argues for reversal of the rejection of claims 1, 4, 5, and 13 without reference to the limitations of any particular claim. *See* Appeal Br. 5–7. Rather, Appellant argues that "[t]here is nothing that would motivate a person of skill in the art to use the composition of Yoshida to polish molybdenum." *Id.* at 6. In particular, Appellant argues that neither Yoshida nor Chen '608 describes or suggests that a polishing composition developed for tantalum would have any expectation of success in polishing

molybdenum. *Id.* According to Appellant, “[m]etals having comparable thermal and electrical properties would not necessarily have equivalent physical or chemical properties relevant to chemical-mechanical polishing. There is no motivation for the combination, [sic] and no rational expectation of success.” *Id.* Appellant further argues that Chen ’608’s abrasive slurry would not be similar to Yoshida’s abrasive slurry “because Yoshida requires adjusting the zeta potential of the silica particle[s], which is not part of the Chen [’608] slurry.” *Id.*

We are not persuaded by Appellant’s argument.

In rejecting claim 1, the Examiner found that Yoshida describes every step of the claimed method, but does not describe or suggest that the metal being polished is molybdenum and does not describe or suggest the specific structure of the quaternary ammonium cationic surfactant. Answer 4–5. The Examiner also found that Chen ’608 describes the formation of embedded metal lines on a substrate by plating copper onto a tantalum seed layer. *Id.* at 5 (citing Chen ’608, 1, Fig. 1). The Examiner further found that Chen ’608 states that molybdenum can replace tantalum and has the advantages of lower resistivity and lower cost. *Id.* The Examiner further found that it would have been obvious to a person having ordinary skill in the art to form a molybdenum seed layer on a substrate that includes a trench, plate the seed layer with copper, and use Yoshida’s CMP composition to polish away both the copper and molybdenum in the areas outside the trench to form an embedded copper line. *Id.*

As the Examiner found, Yoshida and Chen ’608 describes similar CMP compositions. *See* Answer 14. The table below compares these compositions.

	Yoshida	Chen '608
Abrasive	Silica particles	Silica particles
pH	≤ 6	5–10
Oxidizing agent	Hydrogen peroxide	Hydrogen peroxide
Zeta potential	–5 to 30 mV	not specified
Other	Quaternary ammonium surfactant	Ammonium salt
Useful for removing	Tantalum, Copper	Molybdenum, Copper

Id. (citing Yoshida ¶¶ 29, 41–44, 53, 55, 63, 68; Chen '608, 1–2).

Given the similarity between the CMP compositions, a person of ordinary skill in the art at the time of the invention would have had reason to believe that Yoshida's CMP composition could remove molybdenum and copper. We are not persuaded by Appellant's naked assertion that a person of ordinary skill in the art would not have had a reasonable expectation of success. This assertion is not supported by evidence (e.g., hardness of a tantalum seed layer versus a molybdenum seed layer). Accordingly, Appellant's attorney argument is not persuasive.

We also are not persuaded by Appellant's argument regarding Chen '608's silence regarding the zeta potential of the silica particles. Yoshida teaches that the zeta potential of the abrasive particles may be adjusted by an acid, a base, a salt, or a surfactant. Yoshida ¶ 39. As the Examiner explains, Chen '608's slurry contains such agents. In the absence of a showing to the contrary, the Examiner reasonably assumed, *see* Answer 15, that the abrasive particles in the two compositions have similar zeta potentials. *See In re Best*, 562 F.2d 1252, 1255 (CCPA 1977).

Appellant also argues that “[a] person of skill in the art would not combine the amino compound of Grumbine[] with the method of Yoshida[] because Yoshida also teaches hydrogen peroxide as an oxidizing agent[] and does not teach any need for trapping agents.” Appeal Br. 7. Appellant’s argument rests upon Grumbine’s use of a radical trapping agent to decrease the amount of oxidation of the amino compound. Appeal Br. 6–7 (citing Grumbine ¶¶ 7, 8, 18, 32).

In rejecting claim 1, the Examiner also found that Grumbine describes a method of chemical-mechanical polishing of a metal layer using a slurry comprising silica or alumina abrasive particles. *Id.* (citing Grumbine ¶¶ 6, 9, 37). The Examiner further found that Grumbine describes the slurry as preferably comprising a quaternary ammonium polymer that acts as a disbursement and controls the zeta potential of the abrasives to the positive side. *Id.* (citing Grumbine ¶¶ 13, 19–21, 54, 55). The Examiner further found that it would be obvious to a person of ordinary skill in the art to use Grumbine’s quaternary ammonium polymer as the cationic surfactant that adjust the zeta potential of the abrasives in Yoshida’s invention because Grumbine’s quaternary ammonium polymer is known to work for the purpose described in Yoshida.

We are not persuaded by Appellant’s argument that “[a] person of skill in the art would not combine the amino compound of Grumbine[] with the method of Yoshida[] because Yoshida also teaches hydrogen peroxide as an oxidizing agent[] and does not teach any need for trapping agents.” Appeal Br. 7. As the Examiner explains, the reaction between the oxidizing compound and the amino compound would occur when using any amino compound. Answer 16. Since Yoshida describes the use of amino compounds in the absence of a radical trapping agent, there is no reason to

believe that it would not be possible to use the amino compounds described in Grumbine in Yoshida's CMP composition. *Id.* Moreover, as the Examiner also explains, if the reaction between the oxidizing agent and the amino compound presents a problem, Grumbine teaches the solution, which a person of ordinary skill in the art would have adopted. *Id.*

In view of the foregoing, we affirm the rejection of claims 1, 4, 5, and 13 as unpatentable over the combination of Yoshida, Chen '608, and Grumbine.

C. Rejection of claims 2, 14, and 16 as unpatentable over the combination of Yoshida, Chen '608, Grumbine, and Kamiya.

Appellant argues that the rejection of claims 2, 14, and 16 should be reversed based upon the alleged deficiencies of the combination of Yoshida, Chen '608, and Grumbine. Appeal Br. 7. Appellant specifically states that Kamiya does not cure these alleged deficiencies. *Id.*

As discussed above, we have affirmed the rejection of claim 1 as unpatentable over the combination of Yoshida, Chen '608, and Grumbine. We, therefore, also affirm the rejection of claims 2, 14, and 16 as unpatentable over the combination of Yoshida, Chen '608, Grumbine, and Kamiya.

D. Rejection of claims 9, 11, 12, 14, and 16 as unpatentable over the combination of Yoshida, Chen '608, Grumbine, and Dysard.

Appellant argues that Dysard does not cure the alleged deficiencies of the combination of Yoshida and Chen '608/Grumbine. Appeal Br. 8.

As discussed above, we are not persuaded by Appellant's assertion that the combination of Yoshida, Chen '608, and Grumbine is deficient. We, therefore, do not reverse this rejection on that basis.

Appellant also argues that “[t]here is no reason why a person of skill in the art would select an aminosilane described [in Dysard] for selectively polishing dielectric materials such as silicon nitride, and combined it with a composition for polishing metals.” *Id.*

We are not persuaded by this argument. The Examiner found that it would have been obvious to one of ordinary skill in the art at the effective filing date of the invention, in routine experimentation’s, to surface-modify the silica particles of Yoshida with the aminosilane taught by Dysard because Yoshida teaches using a zeta potential-adjusting agent to adjust the zeta potential to a positive side, and Dysard teaches silica particles may be surface-modified with aminosilane in order to have positive charge.

Answer 8.

The Supreme Court has explained 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.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). Moreover, the Federal Circuit has held that an express suggestion to substitute one equivalent for another need not be present to render the substitution obvious. *In re Fout*, 675 F.2d 297, 301 (CCPA 1982).

This is such a situation. We, therefore, affirm the rejection of claims 9, 11, 12, 14, and 16 as unpatentable over the combination of Yoshida, Chen ’608, Grumbine, and Dysard.

E. Rejection of claims 1, 4, 5, and 13 as unpatentable over the combination of Grumbine and Chen ’608.

In arguing for the reversal of this rejection, Appellant does not differentiate between the claims subject to this ground of rejection. *See* Appeal Br. 8. We, therefore, select claim 1 as representative of the group of claims subject to this ground of rejection. 37 C.F.R. § 41.37(c)(1)(iv).

Appellant argues that the rejection of claims 1, 4, 5, and 13 should be reversed because, although Chen '608 teaches that molybdenum may be a better barrier material than tantalum, it fails to teach or suggest that a polishing composition for copper/tantalum, such as the one Grumbine teaches, would polish molybdenum. Appeal Br. 8.

In rejecting claim 1, the Examiner found that Grumbine describes or suggests a CMP composition that is very similar to that described in Chen '608. *See* Answer 8. For ease of reference, the table set forth below compares Grumbine's CMP composition with that described in Chen '608.

	Grumbine	Chen '608
Abrasive	Silica particles	Silica particles
pH	2–11	5–10
Oxidizing agent	Hydrogen peroxide	Hydrogen peroxide
Zeta potential	About 10 to about 30 mV	not specified
Other	Quaternary ammonium surfactant	Ammonium salt
Useful for removing	Tantalum, Copper	Molybdenum, Copper

See id. (citing Grumbine ¶¶ 6, 14, 20, 23, 24, 40, 43, 55); Chen '608, 1–2).

Given the similarity between the CMP compositions, a person of ordinary skill in the art at the time of the invention would have had reason to believe that Grumbine's CMP composition could remove molybdenum and copper. We are not persuaded by Appellant's naked assertion that a person of ordinary skill in the art would not have had a reasonable expectation of success. This assertion is not supported by evidence (e.g., hardness of a tantalum seed layer versus a molybdenum seed layer). Accordingly,

Appellant's attorney argument is not persuasive. *See Icon Health & Fitness*, 849 F.3d at 1043.

In view of the foregoing, we affirm the rejection of claim 1 as unpatentable over the combination of Grumbine and Chen '608. We, therefore, also affirm the rejection of claims 4, 5, and 13 as unpatentable over this combination of prior art.

F. Rejection of claims 2, 14, and 16 as unpatentable over the combination of Grumbine, Chen '608, and Kamiya.

Appellant first argues that Kamiya "provides no motivation to modify the method of Grumbine to use alpha-alumina in place of colloidal silica in the Grumbine composition." Appeal Br. 9.

As the Examiner found, Grumbine discloses that its CMP composition may comprise alumina particles, but does not discuss the crystal phase of its alumina particles. Answer 9 (citing Grumbine ¶ 37). The Examiner also found that Kamiya teaches a CMP method using a slurry including alumina particles and describes the alpha phase of alumina as being preferred over other phases. *Id.* at 10 (citing Kamiya ¶¶ 71, 72, 80). The Examiner further found that, based on Kamiya's description of alpha-alumina as preferred over other phases, a person of ordinary skill in the art would have been motivated to use alpha-alumina as the alumina in Grumbine's CMP composition.

In view of the foregoing, we are not persuaded by Appellant's argument that the Examiner erred by finding a person of ordinary skill in the art would have been motivated to combine the descriptions of Grumbine and Kamiya.

Next, Appellant argues that Kamiya “do[es] not cure the deficiencies of the combined Grumbine references.” Appeal Br. 9.

We are not persuaded by this argument. As we have discussed above, Appellant has not persuaded us that the Examiner erred in rejecting claim 1 as obvious over the combination of Grumbine and Chen ’608.

In view of the foregoing, we affirm the rejection of claims 2, 14, and 16 as unpatentable over the combination of Grumbine, Chen ’608, and Kamiya.

G. Rejection of claims 9, 11, 12, 14, and 16 as unpatentable over the combination of Grumbine, Chen ’608, and Dysard.

Appellant first argues that Dysard does not cure the alleged deficiencies in the combination of Grumbine and Chen ’608. Appeal Br. 9.

As discussed in § E, we are not persuaded by Appellant’s arguments that the Examiner reversibly erred by finding that the combination of Grumbine and Chen ’608 describes or suggests each limitation of independent claim 1. We, therefore, do not reverse the rejection of claims 9, 11, 12, 14, and 16 as unpatentable over the combination of Grumbine, Chen ’608, and Dysard for this reason.

Appellant next argues that “[t]here is no motivation, or expectation of success, to use the surface treated particle of Dysard, designed to polish silicon nitride and silicon oxide, with the combined method of Grumbine.” *Id.*

As we discussed in § D, this argument is not persuasive of reversible error. Dysard describes a specific surface modified silica particles having a zeta potential that overlaps the range set forth in Grumbine. The Examiner, therefore, correctly determined that it would have been obvious for a person

of ordinary skill in the art to of used Dysard's surface-modified silica particle in Grumbine's CMP composition. *See Fout*, 675 F.2d at 301.

H. Rejection of claims 1, 2, and 13 as unpatentable over the combination of Chen '893 and Kamiya.

Appellant argues that the rejection of claims 1, 2, and 13 should be reversed because “Chen [']893 fails to teach the particle having a positive zeta potential, as required by the claims on appeal.” Appeal Br. 9–10.

We are not persuaded to reverse the rejection of these claims on this basis. The Examiner found that Chen '893 describes a method for polishing a molybdenum layer using an aqueous slurry having a pH of the 2–7 comprising silica or alumina particles, an oxidizing agent, and a surfactant that acts as a dispersant. Answer 11. The Examiner further cites Nishimoto¹¹ as evidence that alumina particles in a slurry would have a positive zeta potential in a pH range of 2–9, which encompasses the pH range of the slurry in Chen '893. *Id.* (citing Nishimoto Fig. 1).

In view of the foregoing, we are not persuaded that the Examiner reversibly erred by finding that Chen '893 describes or suggests an alumina particle having a positive zeta potential.

Appellant also presents a specific argument applicable to claims 5 and 13. Appeal Br. 9. In particular, Appellant argues that Chen '893 describes iodate salts as the oxidizing agent in its CMP composition and only describes the use of hydrogen peroxide in a comparative example that demonstrates that a hydrogen peroxide is not useful in Chen '893's CMP composition. *Id.*

¹¹ US 6,582,761 B1, issued June 24, 2003.

In response to Appellant's argument, the Examiner conceded that the argument was persuasive with respect to claim 5 and withdrew the rejection. Answer 18; *see also id.* at 13 (withdrawing rejection of claim 5). Claim 13 appears to be identical to claim 5. Accordingly, we also reverse the rejection of claim 13 as unpatentable over the combination of Chen '893 and Kamiya.¹²

We, therefore, affirm the rejection of claims 1 and 2 as unpatentable over the combination of Chen '893 and Kamiya and reverse the rejection of claim 13 on this basis.

I. Rejection of claims 4, 14, and 16 as unpatentable over the combination of Chen '893, Kamiya, and Grumbine.

Appellant argues that the rejection of claims 4, 14, and 16 as unpatentable over the combination of Chen '893, Kamiya, and Grumbine should be reversed because Grumbine does not cure the alleged deficiencies of Chen '893. Appeal Br. 10.

As we discussed in § H, we are not persuaded that the Examiner reversibly erred in relying on Chen '893 as describing a particle with a positive zeta potential. We, therefore, do not reverse the rejection of claims 4, 14, and 16 on the basis of the alleged defects in Chen '893.

Appellant next argues that the Examiner incorrectly interpreted Grumbine's teaching the use of the quaternary ammonium polymer as solving an alleged instability problem. *Id.*

We do not find this argument persuasive of reversible error for the reasons set forth in § B.

¹² *But see* Final Act. 2 (noting possible objection to claim 13 due to double patenting with respect to claim 5).

In view of the foregoing, we affirm the rejection of claims 4, 14, and 16 as unpatentable over the combination of Chen '893, Kamiya, and Grumbine.

J. Rejection of claims 9, 11, and 12 as unpatentable over the combination of Chen '893, Kamiya, Grumbine, and Dysard.

According to Appellant, “[t]here is no motivation, or expectation of success, to use the surface treated particle of Dysard, designed to polish silicon nitride and silicon oxide, with the combined method of Chen [’893] for polishing molybdenum.” Appeal Br. 10–11.

As we discussed in § D, use of Dysard’s surface-modified silica in Chen ’893’s CMP composition represents the mere substitution of a known equivalent to the abrasive particles described in Chen ’893. Appellant’s argument, therefore, is not persuasive of the existence of reversible error.

In view of the foregoing, we affirm the rejection of claims 9, 11, and 12 as unpatentable over the combination of Chen ’893, Kamiya, Grumbine, and Dysard.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Basis	Affirmed	Reversed
14	112(b)	Indefiniteness	14	
1, 4, 5, 13	103	Yoshida, Chen '608, Grumbine	1, 4, 5, 13	
2, 14, 16	103	Yoshida, Chen '608, Grumbine, Kamiya	2, 14, 16	
9, 11, 12, 14, 16	103	Yoshida, Chen '608, Grumbine, Dysard	9, 11, 12, 14, 16	
1, 4, 5, 13	103	Grumbine, Chen '608	1, 4, 5, 13	
2, 14, 16	103	Grumbine, Chen '608, Kamiya	2, 14, 16	
9, 11, 12, 14, 16	103	Grumbine, Chen '608, Dysard	9, 11, 12, 14, 16	
1, 2, 13	103	Chen '893, Kamiya	1, 2	13

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Claims Rejected	35 U.S.C. §	Basis	Affirmed	Reversed
4, 14, 16	103	Chen '893, Kamiya, Grumbine	4, 14, 16	
9, 11, 12	103	Chen '893, Kamiya, Grumbine, Dysard	9, 11, 12	
Overall Outcome			1, 2, 4, 5, 9, 11-14, 16	

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).

AFFIRMED