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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* KIRK KRAMER, LISA K. MILLER, SHAWN E. DOLAN, and  
PATRICK A. SCALERA

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Appeal 2019-003663  
Application 13/705,576  
Technology Center 1700

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Before JEFFREY B. ROBERTSON, DONNA M. PRAISS, and  
BRIAN D. RANGE, *Administrative Patent Judges*.

ROBERTSON, *Administrative Patent Judge*.

DECISION ON APPEAL<sup>1</sup>

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<sup>1</sup> This Decision includes citations to the following documents: Specification filed December 5, 2012 (“Spec.”); Final Office Action mailed June 6, 2018 (“Final Act.”); Appeal Brief filed October 29, 2018 (“Appeal Br.”); Examiner’s Answer mailed February 15, 2019 (“Ans.”); and Reply Brief filed April 5, 2019 (“Reply Br.”).

### STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>2</sup> appeals from the Examiner's decision to reject claims 4, 6–11, 13–15, and 21–30. *See* Appeal Br. 8–23. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm in part.

### CLAIMED SUBJECT MATTER

Appellant states the invention relates to a sol-gel surface coating that imparts corrosion resistance. Spec. ¶ 2. Claim 7, reproduced below, is illustrative of the claimed subject matter (Appeal Br., Claims Appendix 1):

7. A method for improving corrosion resistance of a metallic substrate, the method comprising steps of:

providing an aqueous organo sol-gel composition consisting essentially of components of:

acid in an amount such that the pH of the aqueous organo sol-gel composition is from 2.5 to 5;

metal acetate selected from the group consisting of zirconium acetate, magnesium acetate, and a combination thereof;

organosilane; and

water;

with the proviso that all zirconium and magnesium present in the aqueous organo sol-gel composition is from said metal acetate;

depositing the composition on an aluminum or aluminum alloy substrate; and

allowing the composition to dry at temperatures less than 100° Celsius to form a sol-gel coating on the substrate,

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<sup>2</sup> We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Henkel AG & Co. KGAA. Appeal Br. 1.

wherein the coated metallic substrate shows no corrosion after at least 500 hours salt spray testing according to ASTM B117.

Claims 15 and 25 are also independent and recite methods for improving corrosion resistance of a metallic substrate. *Id.* at 2–4.

#### REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Kissel	US 5,028,489	July 2, 1991
Matsumura et al. hereinafter “Matsumura”	US 6,197,101 B1	March 6, 2001
Chung et al. hereinafter “Chung”	US 2003/0024432 A1	February 6, 2003
Le Blanc et al. hereinafter “Le Blanc”	US 2009/0148711 A1	June 11, 2009
Hazel et al. hereinafter “Hazel”	US 2009/0239061 A1	September 24, 2009
Young	<i>Overview of Sol-Gel Science and Technology</i> , Army Research Laboratory ARL-TR-2650	January 2002

#### REJECTIONS

1. The Examiner rejected claims 4, 7–11, 13, 14, 21–27, and 29 under pre-AIA 35 U.S.C. § 103(a) as unpatentable over Le Blanc, Kissel, and Young. Final Act. 2–6.
2. The Examiner rejected claim 15 under pre-AIA 35 U.S.C. § 103(a) as unpatentable over Le Blanc, Kissel, Young, and Chung. *Id.* at 6.

3. The Examiner rejected claim 6 under pre-AIA 35 U.S.C. § 103(a) as unpatentable over Le Blanc, Kissel, Young, Chung, and Hazel. *Id.* at 6–7.
4. The Examiner rejected claim 28 under pre-AIA 35 U.S.C. § 103(a) as unpatentable over Le Blanc, Kissel, Young, and Hazel. *Id.* at 7–8.
5. The Examiner rejected claim 30 under pre-AIA 35 U.S.C. § 103(a) as unpatentable over Le Blanc, Kissel, Young, and Matsumura. *Id.* at 8.

## OPINION

### REJECTION 1

Appellant presents separate argument with respect to claims 7, 8–11, and 22–24. *See* Appeal Br. 6, 16–18. We select claims 7, 8, 15, and 22–24 as representative for disposition of this rejection, with the patentability of the other claims standing or falling with claims 7, 8, 15, and 22–24. 37 C.F.R. § 41.37(c)(1)(iv).

#### *Claim 7*

##### *The Examiner's Rejection*

As to claim 7, the Examiner found Le Blanc discloses a method for improving corrosion resistance of a metallic substrate by providing an aqueous organo sol-gel composition including an acid, organosilane, water, a nonaqueous solvent, and which can comprise a metal acetate. Final Act. 2, citing Le Blanc, ¶¶ 3, 4, 43, 60, and 227. The Examiner determined it would have been obvious to have included the metal acetate of Le Blanc in the coating composition because Le Blanc teaches metal acetates are suitable for use in the composition. *Id.* The Examiner found Le Blanc does not

explicitly disclose magnesium or zirconium acetate as recited in claim 7, but found Kissel discloses magnesium acetate as a suitable salt for providing corrosion protection properties in a sol gel. *Id.* at 3–4, citing Kissel, col. 5, ll. 45–62. The Examiner determined it would have been obvious to modify the metal acetate salt of Le Blanc to further include a magnesium acetate as suggested by Kissel in order to provide a salt suitable for the enhancement of the corrosion protection of the coating composition. *Id.* at 4.

*Appellant’s Contentions*

Appellant argues for claim 7, that the transitional phrase “consisting essentially of” does not allow for the addition of the “organometallic” compounds such as those of zirconium, aluminum, and titanium required by Le Blanc.<sup>3</sup> Appeal Br. 6–7. Appellant contends also that claim 7 requires all of the zirconium and magnesium present in the sol-gels be derived from zirconium acetate and magnesium acetate and therefore, the “organometallic” zirconium compounds required by Le Blanc are excluded by the claim. *Id.* at 7, 12.

Appellant contends Le Blanc and Kissel cannot be combined because Kissel is non-analogous art. *Id.* at 9–10. Appellant argues also Le Blanc discloses films with sufficient corrosion resistance without the incorporation of anti-corrosion agents, such that Le Blanc teaches away from the Examiner’s combination. *Id.* at 11. Appellant contends there is insufficient reasoning to support the combination of Le Blanc and Kissel, because the

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<sup>3</sup> Le Blanc appears to be using the term “organometallic” in a non-traditional manner (*see* Appeal Br. 5, 13 (FN6), 23–24) and expressly discloses formulas where there is no metal carbon bond. Le Blanc ¶¶132–136, 150–152 (*see* Formula I (¶ 132) where x=4 (¶ 133)).

composition of Kissel is different than the compositions of Le Blanc and the claims. *Id.* at 10–16. Appellant contends that none of the references teaches or suggests the claimed pH range. *Id.* at 14. Appellant argues the claimed invention presents surprising and unexpected results and satisfies a long felt need in the industry. *Id.* at 3–4; Reply Br. 3–4.

*Discussion*

*“Consisting essentially of”*

At the outset, we are not persuaded by Appellant’s argument that the transitional phrase “consisting essentially of” in claim 7, by itself excludes the hydrolyzable “organometallic” compounds of zirconium, aluminum, or titanium disclosed in Le Blanc. Although Appellant asserts such compounds disclosed in Le Blanc materially affect the basic and novel characteristics of the invention, we have not been directed to sufficient evidence to support Appellant’s contentions.

In this regard, the Specification uses the transitional phrases “comprising,” “consisting essentially of,” and “consisting of” in sequence when setting forth the various embodiments of the invention (*see, e.g.*, Spec. ¶¶ 9–16, 31–39) without any explanation as to what potential ingredients may fall outside the scope of the “middle ground” of “consisting essentially of” between open and closed transitional phrases “comprising” and “consisting of.” The Specification clearly allows for “other conventional sol-gel components” including “corrosion inhibitors” in the compositions according to the invention. *Id.* at ¶ 28. Accordingly, we are not persuaded that the “organometallic” compounds disclosed in Le Blanc would be excluded by the term “consisting essentially of.”

Thus, regardless of whether it was Appellant's intention to exclude the hydrolyzable "organometallic" compounds of zirconium, aluminum, or titanium disclosed in *Le Blanc* (Reply Br. 2–3), Appellant's position is not sufficiently supported. In view of the above, Appellant's position that the Examiner is "clearly incorrect" to have treated the transitional phrase "consisting essentially of" as "comprising" for purposes of examination (Reply Br. 2–3) lacks merit. See MPEP § 2111.03 (II), citing *In re Herz*, 537 F.2d 549, 551-52, (CCPA 1976).

*Obviousness*

We are not persuaded by Appellant's argument that Kissel is non-analogous art. Appellant argues that the field of endeavor of Kissel is improving corrosion protection on metal surfaces employing polymer coatings (paints) whereas Appellant's field of endeavor is a method of improving corrosion protection on aluminum substrates. Appeal Br. 10.

Determining whether a reference is non-analogous art is a two-fold inquiry. First, we must decide if the reference is within the field of the inventor's endeavor; if it is not, we proceed to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved. See *In re GPAC Inc.*, 57 F.3d 1573, 1578 (Fed. Cir. 1995); *In re Wood*, 599 F.2d 1032, 1036 (CCPA 1979).

We agree with the Examiner that Appellant's arguments are insufficient to establish that Appellant's invention and Kissel, which both relate to providing corrosion resistance for metallic surfaces, are in different fields of endeavor. Ans. 7. Indeed, Appellant states, with respect to *Le Blanc*, "[l]ike the present application, *Le Blanc* is concerned with providing corrosion resistant coatings on metals, including aluminum." Appeal Br. 5.

Similarly, Kissel discloses sol or gel compositions for enhancing corrosion-protection of surfaces including aluminum. Kissel, col. 1, ll. 15–37.

Accordingly, the presence of polymer in Kissel’s disclosure (col. 1, ll. 60–68) does not mean Kissel is in a different field of endeavor.

In this regard, Le Blanc provides evidence that one of ordinary skill in the art would have recognized that sols used for corrosion protection of metal surfaces may be employed as primers, paints, and sol-gel coatings that may or may not contain polymers. Le Blanc ¶¶ 60, 203–207, 258. Thus, we are of the view that Kissel is in the same field of endeavor as Appellant’s invention.

We are not persuaded by Appellant’s argument that because Le Blanc’s film achieves corrosion protection “in spite of the fact that no anti-corrosion agents are incorporated into the film according to the invention,” Le Blanc teaches away from incorporating Kissel’s magnesium acetate into the films as in the rejection. Appeal Br. 11, Le Blanc ¶ 62 (emphasis omitted). Although Appellant contends none of the salts disclosed in Le Blanc are described as having anti-corrosion effect (Appeal Br. 11, citing Le Blanc ¶¶ 213, 214, 227), the Kramer Declaration expressly states the lanthanide series metals disclosed in Le Blanc are known corrosion inhibitors. Kramer Decl. ¶ 8, *see* Le Blanc ¶¶ 213, 214.

Thus, rather than teaching away from additional corrosion inhibitors, Le Blanc expressly contemplates the use of additional corrosion inhibitors. This is consistent with the Examiner’s position that Le Blanc does not criticize, discredit, or otherwise discourage the use of corrosion inhibitors such as the salts described in Kissel. Ans. 9.

In addition, we disagree with Appellant’s assessment that in combining Le Blanc and Kissel, the Examiner did not provide sufficient support for selecting Kissel’s magnesium acetate for use as the metal salt in Le Blanc. Appeal Br. 13–14. Le Blanc discloses one or more metal salts may be added, and although Le Blanc does not expressly disclose magnesium acetate, the metal salts exemplified therein are non-limiting. Le Blanc ¶ 227. Kissel discloses the addition of metal salt for enhancing corrosion protection, and expresses a preference for magnesium cations and acetate anions. Kissel, col. 5, l. 45 – col. 6, l. 11. As discussed above, because Le Blanc discloses also the addition of polymers to the sols, we are not persuaded that Kissel’s compositions are totally different than Le Blanc’s compositions as Appellant asserts (Appeal Br. 11).

Moreover, Appellant’s attorney argument that “magnesium acetate is more widely known to function as a corrosive agent, not a corrosion preventative agent” (Appeal Br. 16), is not only unsupported by any evidence, but is in direct contradiction to the express teachings of Kissel. *See* Ans. 14. Arguments of counsel cannot take the place of factually supported objective evidence. *In re Huang*, 100 F.3d 135, 139–40 (Fed. Cir. 1996).

Thus, we are not persuaded by Appellant’s arguments regarding Kissel and Le Blanc and the particular manner by which Appellant argues one of ordinary skill in the art would have to combine the teachings of the two references.

Regarding the presence of “organometallic” compounds of zirconium, aluminum, or titanium in Le Blanc, as discussed above, the transitional phrase “consisting essentially of” in claim 7, does not, by itself exclude such

compounds as argued by Appellant. However, claim 7 additionally recites a proviso that “all zirconium and magnesium present in the aqueous organo sol-gel composition is from said metal acetate.”

In arguing the proviso of “all zirconium and magnesium present in the aqueous organo sol-gel composition is from said metal acetate” excludes the hydrolyzable “organometallic” compounds of zirconium, aluminum, or titanium disclosed in Le Blanc (Appeal Br. 12), Appellant fails to take into account Le Blanc’s full disclosure, which does not require the presence of zirconium, but rather only requires one of zirconium, titanium, or aluminum “organometallic” compounds. Le Blanc, ¶ 41. Thus, as the Examiner points out (Ans. 10), Le Blanc requires only one of such compounds to be present, such that Le Blanc discloses compositions including “organometallic” compounds of aluminum or titanium, which satisfies the proviso because no “organometallic” zirconium compounds would be present that would provide a source of zirconium to the sol-gel composition.

Therefore, Appellant’s arguments regarding the difference between the claimed acetates and organometallic compounds in order to support the position that the Examiner has formulated the rejections based on improper hindsight reasoning (Appeal Br. 12–14), are not persuasive.

*Claims 7, 23, 24*

We are not persuaded by Appellant’s arguments that none of the references discloses or suggests the pH range recited in claims 7, 23, and 24, and, in particular, Young’s pH range of 0–14 encompasses the entire pH range such that there is no suggestion to employ the range recited in claim 7 of 2.5–5, claim 23 of 3–4, and claim 24 of 3.2–3.5 to favor either hydrolysis or condensation. Appeal Br. 14, 17–18. Appellant does not address the

clear effect of pH on hydrolysis and condensation rates as shown in Young's Figure 6. Young 7. Appellant fails to explain why such a teaching is insufficient to support the Examiner's position that pH is a result effective variable that may be adjusted to optimize the desired hydrolysis and condensation rates of the sol-gel. Ans. 12. Moreover, the Specification does not appear to assign any particular criticality to the pH ranges recited in the claims. Spec ¶ 22.

Regarding Appellant's arguments with respect to long felt need and unexpected results, we agree with the Examiner that Appellant has not provided any objective evidence to support such contentions. Ans. 3–4. Establishing long-felt need requires objective evidence showing existence of a persistent problem recognized by those of ordinary skill in the art for which a solution was not known. *In re Gershon*, 372 F.2d 535, 539 (CCPA 1967). Our reviewing court has emphasized repeatedly that “[i]t is well settled that unexpected results must be established by factual evidence. Mere argument or conclusory statements in the specification does not suffice.” *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984), *quoted with approval in In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995).

Further, Appellant argues that the results are surprising and unexpected based in part on the coating produced through the use of the claimed composition being “relatively thin” compared to the coatings in Le Blanc. Reply Br. 3–4. Yet, the thicknesses disclosed in Le Blanc (500 nm to 20 µm) and those disclosed in the Specification (0.6–2.5 µm) overlap. Le Blanc ¶ 63; Spec. ¶ 17. Thus, we are not persuaded by Appellant's contentions.

*Claims 8–11*

Claim 8 depends from claim 7 and recites “the substrate comprises aluminum and has a metallic oxide coating thereon, the sol-gel coating being disposed on the metallic oxide coating to form a seal over the metallic oxide coating.”

The Examiner found Le Blanc teaches applying two layers of its sol-gel coating such that the first coating or “under-layer” would meet the limitation of the recited metallic oxide coating. Final Act. 4, citing Le Blanc, claim 64.

Appellant contends Le Blanc does not disclose depositing a metal oxide coating, but, rather, a coating that deposits in large part, an organo-modified silica. Appeal Br. 16.

We agree with Appellant. In particular, we observe that claim 8 recites the substrate “has a metallic oxide coating thereon” and not “a coating comprising metal oxides.” The presence of an organic substituent in the organosilanes disclosed in Le Blanc (¶¶ 42, 155–173) indicates that even if Le Blanc’s sol is applied in two separate layers (Le Blanc, claim 64), the first layer would still contain an metal-carbon bond. Thus, we are not persuaded the Examiner has provided a sufficient basis to support the position that such a coating would meet the recitation in claim 8 of a “metallic oxide coating.”

As a result, we reverse the Examiner’s rejection of claim 8 and claims 9–11 dependent therefrom.

*Claim 22*

Appellant contends claim 22, which recites “metal acetate 1.75 to 4 as solids” and “organosilane 10 to 25” as weight percentages would not have

been obvious over Le Blanc because Le Blanc requires the combination of minimally 30 weight percent or more of hydrolyzable “organometallic” compound and organosilane, which is greater than the maximum 29 percent by weight of metal acetate and organosilane in claim 22. Appeal Br. 17, citing Le Blanc ¶ 45.

We are not persuaded by this argument for the reasons expressed by the Examiner in the Answer. Ans. 15. Namely, Appellant’s argument relies on Le Blanc’s teachings with respect to the combination of organosilane and hydrolyzable “organometallic” compound, but the Examiner does not rely on this hydrolyzable “organometallic” compound for the metal acetate recited in the claims. See Final Act. 5, citing Le Blanc, Abs., ¶ 228. Thus, Appellant’s arguments do not address the Examiner’s rejection.

*Summary of Rejection 1*

In sum, we affirm the Examiner’s rejection of claims 7 and 25, as well as claims 4, 13, 14, 21–27, and 29 dependent therefrom. However, we reverse the Examiner’s rejection of claims 8–11.

REJECTION 2

*The Examiner’s Rejection*

Regarding independent claim 15, the Examiner relied on similar disclosures in Le Blanc and Kissel as discussed above for independent claim 7. Final Act. 6. The Examiner found that Le Blanc discloses acetic acid and zirconium alkoxides. *Id.* citing Le Blanc, ¶¶ 51, 152. The Examiner found the combined references do not explicitly teach glacial acetic acid, but Chung teaches that it is desirable to use glacial acetic acid in sols containing zirconium alkoxides in order to stabilize the zirconate center and teaches the

acidic catalyst promotes the hydrolysis reaction over condensation. *Id.*, citing Chung, ¶¶ 26, 27. The Examiner determined it would have been obvious to modify the acetic acid of the combined references to be a glacial acetic acid as suggested by Chung in order to stabilize the fast reacting four coordinate zirconate center in the zirconium alkoxide sol to promote hydrolysis over condensation. *Id.*

*Appellant's contentions*

Regarding independent claim 15, Appellant acknowledges claim 15 recites the open-ended transitional phrase “comprising,” which allows for the presence of a hydrolysable zirconium, aluminum, or titanium compound, but argues that because no such hydrolysable metal compounds are described in the specification, they are excluded from the claims. Appeal Br. 8.

In addition to the arguments addressed above with respect to Le Blanc and Kissel, which we found unpersuasive, Appellant argues Chung is different than Appellant's composition, because Chung does not utilize an aqueous solution. *Id.* at 19. Appellant contends Chung's compositions only contain enough water to hydrolyze the hydrolyzable zirconium compound and the organosilane to produce the mixed, organo-substituted zirconium/silicon oxide sol. *Id.* citing Chung ¶ 36. Appellant contends Chung “cannot be compared with Appellants' invention where significant amounts of water are present, and the glacial acetic acid, which is added is rapidly diluted to lower concentrations.” *Id.*

*Discussion*

Initially, we are not persuaded by Appellant's argument that the transitional phrase “comprising” excludes the “organometallic” compounds

disclosed in Le Blanc. Appellant's argument appears to be that because the Specification is silent as to such "organometallic" compounds, the broadest reasonable interpretation of the claims excludes such compounds. Yet, the Specification discloses additives may be added to the composition. Spec.

¶ 28. Therefore, in contrast to Appellant's argument, that the claims would allow for certain "organometallic" compounds disclosed in Le Blanc to be present is not unreasonable based on the Specification. Thus, we agree with the Examiner that the term "comprising" does not exclude the "organometallic" compounds disclosed in Le Blanc. Ans. 6.

As to the presence of glacial acetic acid in claim 15, we are not persuaded by Appellant's arguments, because as the Examiner points out, claim 15 does not contain a concentration of water or glacial acetic acid. Ans. 17. Thus, although Appellant points out alleged differences between Chung's compositions and those recited in claim 15, such differences are not commensurate in scope with the claims. In addition, although Appellant points out certain potential differences between Chung and Appellant's compositions, Appellant does not sufficiently explain why such differences would mean the Examiner's rejection is in error. Indeed, in describing aqueous sol-gel formulations including silane, Le Blanc discloses glacial acetic acid as an example of an acetic acid hydrolysis catalyst. Le Blanc ¶¶ 20, 23.

As a result, we affirm the Examiner's rejection of claim 15.

### REJECTION 3

#### *The Examiner's Rejection*

Claim 6, the subject of Rejection 3, depends from claim 7 and recites, *inter alia*, “the metal acetate comprises zirconium acetate.” The Examiner relied on Le Blanc and Kissel as discussed above for claim 7. Final Act. 6–7. The Examiner relied on Chung for the teaching of glacial acetic acid as discussed above with respect to Rejection 2. *Id.* at 7. The Examiner found that although Le Blanc discloses zirconium alkoxides, Le Blanc does not disclose zirconium acetate. *Id.* citing Le Blanc ¶ 152. The Examiner found Hazel discloses a corrosion resistant sol-gel coating where zirconium acetate is disclosed as an equivalent to zirconium propoxide. *Id.* citing Hazel ¶ 41.

The Examiner determined it would have been obvious to modify the composition of Le Blanc to further include zirconium acetate as suggested by Hazel because Hazel discloses zirconium acetate as a suitable salt for use in corrosion resistant sol-gels. *Id.*

#### *Appellant's Contentions*

Appellant's arguments with respect to Le Blanc, Kissel, and Chung (Appeal Br. 19–20) have been addressed above. Regarding the Examiner's reliance on Hazel, Appellant contends the Examiner's position that Hazel's use of zirconium acetate makes zirconium acetate an equivalent to Le Blanc's “organometallic” zirconium compound is not supported and is “completely at odds scientifically and technologically with the chemical and physical characteristics of organometallic zirconium compounds such as zirconium methoxide and compounds such as zirconium acetate.” Appeal Br. 20. Appellant contends Hazel forms an aqueous solution, not a sol, no acetic acid is present, and the solution is then sprayed onto a substrate at 250

°C to form a ceramic coating. *Id.* at 20–21, citing Hazel ¶¶ 41, 45.

Appellant contends the solution dries to form a gel coating, and that under this process, which relies on the formation of ceramic metal oxides, any source of zirconium, no matter the counter ion or counter group (covalently bonded radical), is equivalent. *Id.* at 21.

#### *Discussion*

We agree with Appellant. That is, Hazel discloses “[s]uitable ceramic metal precursors include, but are not limited to, zirconyl nitrate, zirconium acetate, zirconia oxychlorate, zirconium n-propoxide and combinations thereof.” Hazel, ¶ 41. Hazel discloses the coating composition may be applied at room temperature, but then “the film is heat treated at a temperature from about 250 °C. to about 1080 °C. to convert the polymer precursor solution to an oxide ceramic comprising ceramic corrosion resistant coating.” *Id.* at ¶ 43.

We acknowledge that Le Blanc allows for a “ceramic melting treatment” up to 2500 °C. Le Blanc, ¶ 60. Nevertheless, we agree with Appellant that one of ordinary skill in the art would not have had a sufficient reason to turn to Hazel’s disclosure of ceramic precursors including zirconium acetate when formulating Le Blanc’s compositions to allow for compositions to dry at less than 100 °C as required in claim 7, from which claim 6 depends. Although the Examiner stated that high temperature processing is not excluded by the claims (Ans. 20), the Examiner has not provided sufficient reasoning why one of ordinary skill in the art would perform a high temperature processing step, which appears necessary to support the Examiner’s position of equivalency, as well as a drying step less than 100 °C as required in claim 7, from which claim 6 depends.

Accordingly, we reverse the Examiner's rejection of claim 6.

#### REJECTION 4

Claim 28, the subject of Rejection 4, and which depends from claim 25, and recites "the metal acetate is zirconium acetate or a combination of zirconium acetate and magnesium acetate," the Examiner relies on Hazel for similar reasons as discussed above for Rejection 3. Final Act. 8. Appellant relies on similar arguments as discussed above with respect to claim 6. Appeal Br. 21–22.

We reverse the Examiner's decision to reject claim 28 for the same reasons as discussed above regarding claim 6.

#### REJECTION 5

##### *The Examiner' Rejection*

Claim 30, the subject of Rejection 5, is dependent from claim 25 and recites "wherein the solvent is a glycol ether." The Examiner relied on the combination of Le Blanc, Kissel, and Young as discussed above for Rejection 1, but found that the combined references, while disclosing the use of glycol solvents, were silent as to the specific glycol solvent. Final Act. 8; *see id.* at 3, citing Le Blanc ¶ 43. The Examiner found Matsumura discloses a sol-gel solvent where a small amount of organic solvent such as alcohol or glycol ether may be added for enhancing film formability. *Id.*, citing Matsumura, col. 10. l. 64 – col. 11, l. 15. As a result, the Examiner determined it would have been obvious to use a glycol solvent in the sol-gel coating compositions of the combined references in order to obtain a coating with desired film formability. *Id.*

*Appellant's Contentions*

Appellant contends Matsumura is directed to a coating composition comprising silicone resin and a photooxidation catalyst for use in construction materials, and the photooxidation catalyst sols are not reactive solutions such as those claimed, and as such, Matsumura's disclosure does not imply that glycol ethers can be used in other sols. Appeal Br. 22–23.

*Discussion*

We are not persuaded by Appellant's arguments. Although Appellant observes certain differences between the specific compositions disclosed in Le Blanc and Matsumura, we are not persuaded one of ordinary skill in the art would not have looked to Matsumura for a disclosure of common glycol solvents, particularly where, as discussed above, Le Blanc discloses additional organic binders may be added (§ 203), which overlap with the film forming agents that may be added to the compositions of Matsumura (col. 10, l. 64 – col. 11, l. 4).

Accordingly, we affirm the Examiner's rejection of claim 30.

DECISION SUMMARY

In summary:

<b>Claim(s) Rejected</b>	<b>35 U.S.C. §</b>	<b>References/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
4, 7–11, 13, 14, 21–27, 29	103	Le Blanc, Kissel, Young	4, 7, 13, 14, 21–27, 29	8–11
15	103	Le Blanc, Kissel, Young, Chung	15	

<b>Claim(s) Rejected</b>	<b>35 U.S.C. §</b>	<b>References/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
6	103	Le Blanc, Kissel, Young, Chung, Hazel		6
28	103	Le Blanc, Kissel, Young, Hazel		28
30	103	Le Blanc, Kissel, Young, Matsumura	30	
<b>Overall Outcome</b>			<b>4, 7, 13–15, 21–27, 29, 30</b>	<b>6, 8–11, 28</b>

**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). *See* 37 C.F.R. § 1.136(a)(1)(iv).

**AFFIRMED IN PART**