UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte Jian Tao and Carrie Webster

Appeal 2007-2660
Application 10/373,198
Technology Center 1700

Decided: June 18, 2008

Before: RICHARD E. SCHAFER, SALLY G. LANE, and
JAMES T. MOORE, *Administrative Patent Judges*.

SCHAFER, *Administrative Patent Judge.*

DECISION ON APPEAL

Applicants appeal from the Final Rejection of Claims 1-10. 35 U.S.C. § 134(a). We have jurisdiction. 35 U.S.C. § 6 (b). We affirm.

STATEMENT OF THE CASE

An Examiner finally rejected Claims 1-10 on five grounds:

1. Claims 1, 2 and 5 under 35 U.S.C. § 102(e) as anticipated by Osen[1];
2. Claims 1 and 2 under 35 U.S.C. § 103(a) over Guo[2];

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[1] U.S. Published Application 2003/0144400.
[2] U.S. Published Application 2003/0171500.

3. Claims 1-4 under 35 U.S.C. § 102(a) as anticipated by Yeh[3];
4. Claim 5 under § 103(a) over the combined teachings of Yeh and Mizuno[4]; and
5. Claims 6-10 under 35 U.S.C. § 103(a) over the combined teachings of Yeh, Mizuno and Tao[5].

FINDINGS OF FACT

Subject Matter of the Invention

F. 1. The claimed subject matter relates to methods and aqueous formulations for producing crosslinked carboxylated polyacrylonitrile butadiene rubber for use in gloves. Spec., p. 4, ¶ 0015.

F. 2. The invention relies on a peroxide crosslinking system "in combination with zinc oxide (ZnO)." Spec. p. 4, ¶ 0013.

F. 3. In the "Detailed Description of Invention" Applicants emphasize that the invention combines ZnO and peroxide to produce the rubber:

> In this invention, a formula is described that combines ZnO and peroxide to produce a thin wall nitrile glove that possesses desired and balanced physical properties . . . .

Spec. p. 8, ¶ 0030.

F. 4. Applicants further state that ZnO "acts as [an] ionic cross linker between carboxylated groups." Spec., p. 2, ¶ 0006.

F. 5. The specification also says that ZnO "will react with carboxylated groups at room temperatures to result in ionic crosslinking." Spec., p. 7, ¶ 0026.

[3] U.S. Patent 6,391,409.
[4] U.S. Patent 5,408,007
[5] U.S. Patent 6,451,893

F. 6. Applicants disclose that the rubber is formed by curing at an elevated temperature. Spec., p. 9, ¶ 0031.

Claims 1-9

F. 7. Claims 1-9 each require an aqueous dispersion including zinc oxide (ZnO) crosslinked carboxylated polyacrylonitrile butadiene and an effective amount of a peroxide. Spec., p. 4, ¶¶ 0013 - 0015.

F. 8. For example, Claim 1 provides:

> 1. A formulation for producing a nitrile glove comprising an aqueous dispersion of a **zinc oxide cross linked carboxylated polyacrylonitrile butadiene** and an effective amount of peroxides as a cross-linking component.

Supp. App. Br., p. 6, Claims Appendix (emphasis added).[6]

F. 9. Applicants state that the formulation of Claim 1 is described by their Example 3:

> Claim 1 recites a formulation for producing a nitrile glove comprising an aqueous dispersion of a zinc oxide cross linked carboxylated polyacrylonitrile butadiene and an effective amount of peroxides as a cross-linking component. The formulation is set forth in Example 3 on page 8 of the specification.

Supp. App. Br., p. 2 (Emphasis added).

F. 10. Applicants' Example 3 is said to be a "compounding formula" including ZnO and Peroxide. Spec., p. 8, Example 3.

[6] Throughout this decision, we refer to the Supplemental Appeal Brief filed December 7, 2006. All references to the claims are to the copy appearing in the Claims Appendix submitted with that Appeal Brief. App. Br., pp. 6 and 7 (Claims Appendix). The Examiner has certified the copy to be correct. Ans., p. 2.

F. 11. We understand "compounding formula" to mean the listing of "raw" ingredients which are combined and subsequently cured to make the rubber.

F. 12. Example 3 lists the following raw ingredients:

> **ZnO;**
> **carboxylated polyacrylonitrile butadiene;**
> the peroxide 2,5-dimethyl-2,5-di(t-buty1peroxy)hexane;
> a phenolic antioxidant;
> titanium dioxide;
> potassium hydroxide; and
> water

Spec. p. 8, Example 3 (emphasis added).

F. 13. Example 3 does not recite ZnO <u>crosslinked</u> carboxylated polyacrylonitrile butadiene as required by claims 1-9.

F. 14. The examiner rejected Claims 1-9 relying on three "primary" references: 1) Osen; 2) Guo and 3) Yeh.

F. 15. Each of the references relates to aqueous formulations for making rubber containing carboxylated acrylonitrile butadiene (CAB[7]). Osen, p. 1, ¶ 0010; Guo, p. 4, ¶ 0033; Yeh, Col. 3, l. 62 – Col. 4, l. 18.

F. 16. Each of the references describes making rubber by curing an aqueous formulation including ZnO, CAB and peroxide.

F. 17. Osen teaches aqueous rubber forming formulations (Osen, p. 1, ¶ 0014) including ZnO (Osen, p. 1, ¶ 0013), CAB (Osen, p.1, ¶ 0010),

[7] We understand Applicants' carboxylated **poly**acrylonitrile butadiene to be the same material as carboxylated acrylonitrile butadiene described by the references. Applicants have not argued that the two names identify different materials. We will refer to both Applicants' carboxylated **poly**acrylonitrile butadiene and the prior art carboxylated acrylonitrile butadiene as CAB.

and an effective amount of peroxide as a cross-linking component (Osen, p.1, ¶ 0012).

F. 18. Guo teaches a latex formulation for making rubber.

F. 19. We understand "latex" to be a colloidal suspension of polymer particles stabilized by dispersing agents in an aqueous medium.[8]

F. 20. Guo's latex may include ZnO, CAB, and an effective amount of peroxide. Guo, p. 4, ¶¶ 0033, 0035; p. 6, ¶ 0061, Table 5, Run C. [9]

F. 21. Yeh relates to latex formulations for making rubber gloves. Yeh, col. 3, l. 62 - 63.

F. 22. Yeh's latex may include a vulcanization activator, CAB (Yeh, col. 3, l. 63, - col. 4, l. 18), and a crosslinker (Yeh, col. 4, l. 15-18).

F. 23. The vulcanization activator may be ZnO. Yeh, Col. 4, l. 23-25.

F. 24. The crosslinker may be an organic peroxide. Yeh, Col. 4, l. 19-20.

F. 25. Thus Yeh discloses an aqueous dispersion including ZnO, CAB and a peroxide.

F. 26. Yeh's formulations may also include a vulcanization accelerator. Yeh, Col. 2, ll. 26-30.

F. 27. The vulcanization accelerator may be, inter alia, aldehyde-amine reaction products or guanidines. Yeh, Col. 2, ll. 35-40.

F. 28. Each of the references teaches heating the aqueous formulation to cure the rubber. Osen, p. 4, ¶ 0064; Guo, p. 7, Table 8, Compound C; Yeh, col. 5, ll. 13-19.

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[8] E.g., Kirk-Othmer Encyclopedia of Chemical Technology, 5th Ed., "Latex Technology," John Wiley & Sons, 2001.

[9] The brand name KRYNAC X7.40 ™ in Table 5, Run C is a terpolymer of methacrylic acid-acrylonitrile-butadiene. Guo, p. 4, ¶ 0045. That terpolymer is a carboxylated acrylonitrile butatidiene.

F. 29. None of the references expressly describe that the formulations include ZnO crosslinked CAB as required by each of Claims 1-9.

F. 30. However, Applicants and each of the references disclose using essentially the same starting materials (an aqueous dispersion including ZnO, CAB and a peroxide) and the same method to cure the rubber.

F. 31. The formation of ZnO crosslinked CAB is inherent in Osen's, Guo's and Yeh's disclosures.

F. 32. The subject matter of Claim 1 is anticipated by Osen.

F. 33. The subject matter of Claim 1 is anticipated by Yeh.

Claim 10

F. 34. The subject matter of Claim 10 pertains to thin wall sulfur free nitrile gloves. Spec., p. 8, ¶ 0030

F. 35. Claim 10 does not require ZnO crosslinked CAB

F. 36. Claim 10 requires an aqueous solution including ZnO and CAB.

F. 37. Claim 10 provides:

> 10. A thin wall sulfur free nitrile glove made from a solution c**onsisting essentially of**:
> a) **carboxylated polyacrylonitrile butadiene**,
> b) **zinc oxide**,
> c) 2,5-dimethyl-2,5-di(t-butylperoxy)hexane,
> d) a phenolic antioxidant,
> e) titanium dioxide,
> f) potassium hydroxide, and
> g) water.

App. Br., p. 7, Claims Appendix (emphasis added).

F. 38. The Examiner rejected Claim 10 as well as Claims 6-9 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Yeh, Mizuno and Tao. Ex. Ans., pp. 4-5.

F. 39. Yeh teaches all the ingredients of Claim 10 except the specific peroxide 2,5-dimethyl-2,5-di(t-butylperoxy)hexane and potassium hydroxide.

F. 40. Mizuno and Tao were relied upon for teaching the specific peroxide (2,5-dimethyl-2,5-di(t-butylperoxy)hexane) and potassium hydroxide, respectively.

ISSUES

The Examiner contends that the aqueous mixtures including ZnO, CAB and peroxide taught by Osen, Guo and Yeh, will inherently form ZnO crosslinked CAB. With respect to Claims 1-9, Applicants contend that the references relied upon do not expressly describe the formation of ZnO crosslinked CAB. For Claim 10 Applicants contend that the phrase "consisting essentially of" excludes the presence of vulcanization accelerators from the composition.

As to Claims 1-9, the dispositive issue is whether Applicants have shown error in the Examiner's finding that ZnO crosslinked CAB would inherently form. For Claim 10 the issue is whether Applicants have demonstrated that the transitional phrase "consisting essentially of" excludes the presence of vulcanization accelerators.

ANALYSIS

Claims 1-9

The Examiner rejected various subsets of the Claims on 5 different grounds. However, all the rejections of Claims 1-9 are based upon the inherent formation of ZnO crosslinked CAB in the compositions described by Osen, Guo and Yeh, respectively. Applicants only challenge the inherency of forming ZnO crosslinked CAB. Accordingly, we treat all the

rejections relating to Claims 1-9 as standing or falling with the resolution of the inherency issue.

Inherency of ZnO crosslinked CAB

The subject matter of Applicants' Claims 1-9 and the Osen, Guo and Yeh references relates to compositions for making CAB containing rubber. Supp. App. Br., p. 6, Claim 1; Osen, p. 1, ¶ 0010; Guo, p. 4, ¶ 0033; Yeh, Col. 3, l. 62 – Col. 4, l. 18. In making the rubber, both Applicants and the prior art begin with aqueous dispersions including ZnO, CAB and an effective amount of peroxide. Thus, Applicants state that the formulation of their Claim 1 –which expressly requires an aqueous dispersion of ZnO crosslinked CAB and a peroxide-- is taught by Example 3 in their written description. Supp. App. Br. p. 2. Applicants' Example 3 describes a "compounding formulation" including ZnO, CAB, a peroxide and water. Spec., p. 8. Osen, Guo and Yeh similarly begin with an aqueous mixture including ZnO, CAB and an effective amount of peroxide. Osen, ¶¶, 0010, 0012, and 0013; Guo, p. 4, ¶¶ 0035, p. 6, ¶ 0061 and Table 5, Run C; Yeh, Col. 3, l. 63 – Col. 4, l. 25. Applicants have not challenged the Examiner's finding that each reference describes an aqueous formulation including ZnO, CAB and a peroxide. Both Applicants and the prior art teach heating the formulation to cure the rubber. Spec., p. 9, ¶ 0031; Osen, p. 4, ¶ 0064; Guo, p. 7, Table 8, Compound C; Yeh, col. 5, ll. 13-19.

Since both Applicants and each of the references use essentially the same starting ingredients in essentially the same process to form a CAB containing rubber, it is reasonable to infer that ZnO crosslinked CAB would inherently form during the formation of rubber as taught by Osen, Guo and Yeh. *Cf. In re Spada*, 911 F.2d 705, 708 (Fed. Cir. 1990) ("[W]e think that

it was reasonable for the PTO to infer that the polymerization . . . of identical monomers, employing the same or similar polymerization techniques, would produce polymers having the identical composition.").

Applicants criticize the Examiner's reference to ¶ 0006 of their written description. Paragraph 0006 is part of Applicants' description of the "Background of the Invention." Spec., p. 2, ¶ 6. Applicants there say that with respect to CAB containing formulations, ZnO acts as both a primary activator for sulfur vulcanization and a CAB crosslinking agent. [10] According to Applicants, reference to their written description was inappropriate because anticipation must be based only on "the disclosure of the references." Supp. App. Br., p. 3. The Examiner responds that he referred to the specification not as prior art, but in response to the Applicants' argument that the zinc oxide taught by Osen would not function as a crosslinking agent. Ans., p. 6.

Our review of the record indicates that the Examiner did not inappropriately rely on Applicants' disclosure. The Examiner relied upon Osen's, Guo's and Yeh's teachings of the use of ZnO in rubber formulations and found that those formulations would inherently form ZnO crosslinked CAB. The Examiner referenced Applicants' disclosure to point out that his finding that ZnO would inherently crosslink CAB was not inconsistent with

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[10] Paragraph 0006 provides as follows:

> To speed up the process and improve quality consistency, hundreds of chemicals were used. ZnO is the most important one, which is called the primary activator. This is essentially true for most rubbery materials, except for [CAB], in which the function of ZnO is two fold. In addition to primary activator for sulfur cross linking, it also acts as ionic cross linker between carboxylated groups.

Spec., p. 2, ¶ 0006.

Applicants' own teachings. It is not improper for the Office to compare the product and process of the prior art with Applicants' disclosure in determining whether the prior art product and an applicant's product are the same. *See In re Thorpe*, 777 F.2d 695, 697-698 (Fed. Cir. 1985)(deciding that it was appropriate for the Office to rely on the applicant's statement of a chemical fact in comparing the similarities of reactants, reaction conditions and properties to determine if the applicant's and the prior art products were the same).

We note that Applicants argue that it cannot be assumed that ZnO will function as a crosslinking agent for CAB. E.g., Supp. App. Br., p. 4. On the record before us we disagree.

Applicants' statements about the function of ZnO do not distinguish Applicants' formulations from the formulations of the prior art. In this regard we note that Applicants' do not argue that they employ special steps or techniques to cause ZnO to function as a cross linking agent. Nor do they argue that there are special steps or techniques present in the prior art that would cause ZnO not to act as a cross linking agent. Indeed, it appears that the mere presence of ZnO and CAB will result in crosslinking: "ZnO will react with carboxylated groups at room temperatures to result in ionic crosslinking." Spec. p. 7, ¶ 0026. On the record before us we do not see why the same would not be true for the ZnO and CAB containing rubber formulations of the prior art. Thus, it is reasonable to find, as did the Examiner, that the "presence of ZnO would result in the formation of crosslinked carboxylated acrylonitrile-butadiene rubber." Ex. Ans. p. 3.

Where an applicant's and the prior art's compositions reasonably appear to be the same, the applicant must "prove that the prior art products

do not necessarily or inherently possess the characteristics of [the] claimed product." *In re Thorpe*, 777 F.2d at 698 (*quoting In re Fitzgerald*, 619 F.2d 67, 70 (CCPA 1980)). *See also In re Best*, 562 F.2d 1252, 1255 (CCPA 1977) ("Where . . . the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product.").

Applicants have not provided test data or results demonstrating that ZnO crosslinked CAB does not form when making rubber according to Osen's, Guo's or Yeh's teachings. Rather, Applicants rely on three patents in an attempt to refute that ZnO inherently acts as a cross linker with CAB. App. Br., pp. 3, 4. However, those patents are consistent with a finding of inherency. Each patent teaches that ZnO acts as a crosslinking agent in polymer compositions. Powell, col. 1, ll. 42-58; Suddaby, col. 4, ll. 45-51; and Lipinsky, col. 1, ll. 37-43. Moreover, Lipinski specifically teaches that zinc oxide acts as a crosslinking agent for CAB in aqueous dispersions. Lipinski, col. 1, ll. 30-35 and 43-48.

We recognize that Osen, Guo and Yeh, do not characterize ZnO as a crosslinking agent. For example, Osen describes ZnO as an acid scavenger. Osen, p. 1, ¶ 0013. However, Applicants have neither provided an explanation nor directed us to evidence showing that the ZnO would not also act as a crosslinker for the ZnO and CAB containing formulations described by Osen, Guo and Yeh.

Applicants point to certain information in the Evidence Appendix asserting that that it shows that when "zinc oxide but no sulphur is used, the

result is a gummy substance because sulphur is the crosslinker, not zinc oxide." App. Brief, p. 4. This "evidence" was apparently submitted for the first time with Applicants' appeal brief.

We decline to consider this information. Applicants have not identified where this information was previously before the Examiner. *See* 37 CFR § 41.37(c)(1)(ix) (requiring the appendix to identify where in the record the evidence was entered by the examiner). Nor are any of the circumstances permitting filing of new evidence after appeal present here. *See* 37 CFR § 41.33(d)(2) (precluding additional evidence after appeal except where the applicant requests reopening prosecution or in response to a decision by the board entering a new ground of rejection). Additionally, this new "evidence" was not submitted in the form of an affidavit or declaration as required by 37 CFR § 1.132. Thus Applicants' "gummy substance" argument is without admissible evidentiary support and is not entitled to any weight. "[A]rguments of counsel cannot take the place of evidence lacking in the record." *Estee Lauder Inc. v. L'Oreal, S.A.*, 129 F3d 588, 595 (Fed. Cir. 1997) *quoting Knorr v. Pearson*, 671 F.2d 1368, 1373 (CCPA 1982). *See also, In re Lindner*, 457 F.2d 506, 508 (CCPA 1972) ("mere lawyers' arguments unsupported by factual evidence are insufficient").

The record before us establishes, by a preponderance of the evidence, that ZnO crosslinked CAB would inherently form in the aqueous rubber compositions taught by Osen, Guo and Yeh.

As Applicants have not challenged any of the Examiner's other findings and conclusions with respect to Claims 1-9 we affirm the rejections of those claims.

Claim 10

The subject matter of Claim 10 does not require ZnO crosslinked CAB. Rather, it requires a solution including ZnO, CAB, a specific peroxide and certain other ingredients. The Examiner rejected Claim 10 on the same grounds as Claims 6-9 relying on the combined teachings of Yeh, Mizuno and Tao. Yeh teaches an aqueous solution including ZnO, CAB and a peroxide. Yeh's rubber forming solutions also may include a vulcanization accelerator. Yeh, Col. 2, ll. 26-30. The only ground of error alleged by Applicants is that the transitional phrase "consisting essentially of" "excludes the use of a vulcanization accelerator . . . ." App. Br., p. 5. Applicants argue that since Yeh teaches the use of a vulcanization accelerator, the subject matter of "the claim is not obvious in view of the prior art teachings." App. Br., p. 5.

As used in patent claiming, the phrase "consisting essentially of" is a term of art. The phrase leaves the claim open to additional unnamed components that do not materially affect the basic and novel properties of the invention. *PPG Industries v. Guardian Industries Corp.*, 156 F.3d 1351, 1354 (Fed. Cir. 1998). Thus, Applicants implicitly argue that the inclusion of a vulcanization accelerator would materially affect the basic and novel properties of the rubber composition of Claim 10.

Applicants, however, have provided neither an explanation nor directed us to evidence showing that the inclusion of a vulcanization accelerator would have a material affect. All we are provided is Applicants' bare contention that "consisting essentially of" excludes the use of vulcanization accelerators. While the requirement in Claim 10 that the solution be "sulfur free" would exclude certain of Yeh's expressly described

accelerators, e.g., those including a sulfur moiety, Yeh also teaches the use of aldehyde-amine reaction products[11] or guanidines[12] as accelerators. Yeh, col. 4, ll. 26-32. These compounds do not require sulfur. [13] Additionally, our review of the written description indicates that while sulfur is to be avoided, the written description does not reveal that Applicants clearly disavowed the use of all vulcanization accelerators, including non-sulfur containing accelerators.

Applicants have failed to establish that "consisting essentially of" as used in Claim 10 would exclude the presence of vulcanization accelerators.

As Applicants have not challenged any of the Examiner's other findings and conclusions relating to Claim 10, we affirm the rejection of that Claim.

CONCLUSIONS

On the record before us, the Applicants have not sustained their burden of establishing that the Examiner erred in holding that the claimed subject matter would have been anticipated within the meaning of 35 U.S.C. §§ 102(a) and (e) or would have been obvious within the meaning of 35 U.S.C. § 103(a).

DECISION

We affirm the following rejections:

1. Claims 1, 2 and 5 under 35 U.S.C. § 102(e) as anticipated by Osen;

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[11] Aldehydes may be represented by the general formula RCH=O. Amines may be represented by the general formula R_3N, where R must be at least one alkyl or aryl moiety

[12] Guanidine may be represented by the general formula $(H_2N)_2C=NH$.

[13] See footnotes 11 and 12.

2. Claims 1 and 2 under 35 U.S.C. § 103(a) over Guo;
3. Claims 1-4 under 35 U.S.C. § 102(a) as anticipated by Yeh;
4. Claim 5 under § 103(a) over the combined teachings of Yeh and Mizuno; and
5. Claims 6-10 under 35 U.S.C. § 103(a) over the combined teachings of Yeh, Mizuno and Tao.

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

qsg

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