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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte LUCA GIANNINI, ANGELA LOSTRITTO, and
MARIO MARIANI

Appeal 2019-004710
Application 14/430,403
Technology Center 1700

Before ROMULO H. DELMENDO, BEVERLY A. FRANKLIN, and
SHELDON M. MCGEE, *Administrative Patent Judges*.

DELMENDO, *Administrative Patent Judge*.

DECISION ON APPEAL

The Appellant¹ appeals under 35 U.S.C. § 134(a) from the Primary Examiner’s final decision to reject claims 21–27, 31, and 33–46.² We heard oral arguments from the Appellant’s representative on February 13, 2020. We have jurisdiction under 35 U.S.C. § 6(b).

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42—namely, “PIRELLI TYRE S.P.A.” (Application Data Sheet filed March 23, 2015 at 5), which is also identified as the real party in interest (Appeal Brief filed February 25, 2019 (“Appeal Br.”) at 3).

² See Appeal Br. 8–27; Reply Brief filed May 29, 2019 (“Reply Br.”) at 2–13; Final Office Action entered July 27, 2018 (“Final Act.”) at 2–7; Examiner’s Answer entered April 2, 2019 (“Ans.”) at 3–7.

We affirm. Nevertheless, because our obviousness analysis relies on new factual findings and reasoning not previously communicated to the Appellant, we designate our decision as including a new ground of rejection pursuant to 37 C.F.R. § 41.50(b) so as to preserve the procedural safeguards that must be afforded to the Appellant. *See In re Stepan Co.*, 660 F.3d 1341, 1346 (Fed. Cir. 2011) (“Had the Board labeled its rejection as a new ground of rejection, Stepan could have reopened prosecution to address the newly-alleged deficiencies in its Declaration with the examiner.”); *In re Leithem*, 661 F.3d 1316, 1319 (Fed. Cir. 2011) (“Mere reliance on the same statutory basis and the same prior art references, alone, is insufficient to avoid making a new ground of rejection when the Board relies on new facts and rationales not previously raised to the applicant by the examiner.”).

I. BACKGROUND

The subject matter on appeal relates to a tire for vehicle wheels (Specification filed March 23, 2015 (“Spec.”) at 1, l. 4). The Inventors characterize their discovery, as follows:

The Applicant found that *it was possible to obtain tires which have improved performance during use under extreme working conditions* by making the [tire’s] antiabrasive strip with an elastomeric material comprising inorganic fibres having nanometric dimensions, preferably inorganic fibres consisting of magnesium and/or aluminium silicates.

The Applicant found that the addition of inorganic fibres having nanometric dimensions to the elastomeric material with which the antiabrasive strip is made *resulted in an increase in the performance of the tire under extreme working conditions*, in particular as regards the stability and handling, without incurring any problems of fragility or rapid degradation of the tire.

This is surprising considering the fact that the Applicant had noted that the elastomeric material reinforced with the abovementioned magnesium and/or aluminium silicate inorganic fibres having nanometric dimensions showed a large decrease in the dynamic shear modulus as the dynamic strain increased, i.e. a high Payne effect, which was such as to consider the material unsuitable for use in high performance tires.

A high Payne effect typically involves a loss of reinforcement as the strain increases, which results in a decline in the performance of the tire.

Nevertheless, *the Applicant performed tests on tires bearing an antiabrasive strip made with an elastomeric material reinforced with the abovementioned fibres and found, surprisingly, optimum stability and handling performance without the tire becoming fragile in the bead regions.*

(*Id.* at 2, l. 22–3, l. 17 (emphases added)).

Figure 1 (annotated) is reproduced from the Drawings filed March 23, 2015, as follows:

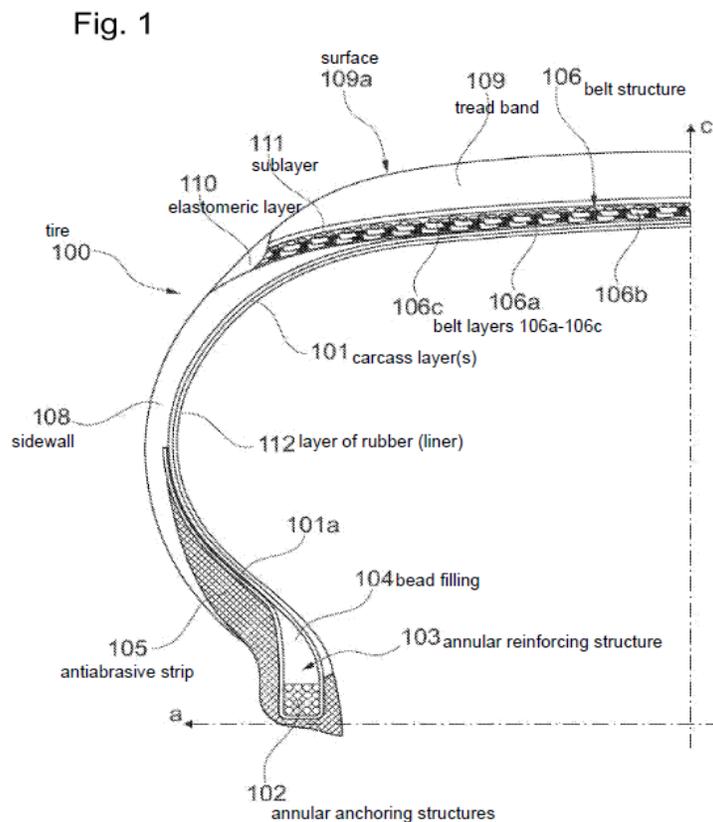


Figure 1 above shows a cross-sectional view of a radial tire **100** comprising, *inter alia*: a carcass structure having at least one carcass layer **101**; annular anchoring structures **102** and bead filling **104** forming an annular reinforcing structure **103**; an antiabrasive strip **105**; a belt structure **106** including belt layers **106a–106c**; a sidewall **108**; a tread band **109**; a belt consisting of elastomeric material layer **110**; a sublayer **111**; and a rubber (liner) layer **112** (Spec. 13, l. 4–15, l. 17).

Representative claim 21 is reproduced from the Claims Appendix to the Appeal Brief, as follows:

21. A tire for vehicle wheels comprising:
a carcass structure comprising at least one carcass layer having opposed side edges associated with relative annular reinforcing structure;
a tread band applied in a radially outer position with respect to said carcass structure;
a pair of sidewalls laterally applied onto opposite sides with respect to said carcass structure; and
at least one antiabrasive strip applied in an outer position of each of said annular reinforcing structure,
wherein *said at least one antiabrasive strip comprises a crosslinked elastomeric material obtained by crosslinking of a crosslinkable elastomeric composition comprising sepiolite fibres having nanometric dimensions and at least one additional reinforcing filler*, wherein said sepiolite fibres are present in an amount of about 1 to about 20 phr and said at least one additional reinforcing filler is present in an amount of about 20 to about 90 phr, wherein said crosslinkable elastomeric composition does not include attapulgit, *wherein said crosslinked elastomeric material has an elastic dynamic modulus E' value, at 70°C, and at a frequency of 10 Hz, higher than about 8.00 M[Pa] and has a value of static load at 100% elongation equal to or higher than 5 M[Pa].*

(Appeal Br. 28–29 (emphases added)).

II. REJECTIONS ON APPEAL

The claims on appeal stand rejected under 35 U.S.C. § 103(a) (pre-AIA), as follows:

- A. Claims 21–27, 31, and 33–46 as unpatentable over Mizuno et al.³ (“Mizuno”) and Galan;⁴ and
- B. Claims 42 and 43 as unpatentable over Mizuno, Galan, and Yoshioka.^{5, 6}

III. DISCUSSION

1. *Grouping of Claims*

The Appellant’s arguments against both rejections are based solely on claim 21 (Appeal Br. 8–27). Therefore, we decide the appeal as to both rejections on the basis of claim 21, which we select as representative pursuant to 37 C.F.R. § 41.37(c)(1)(iv). Claims 22–27, 31, and 33–46 stand or fall with claim 21.

2. *The Examiner’s Position*

The Examiner finds that Mizuno describes most of the limitations recited in claim 21 but acknowledges that the reference teaches kaolin clay rather than sepiolite clay specified in the claim (Final Act. 2). To resolve this difference, the Examiner relies on Galan, which was found to teach that

³ US 2010/0190907 A1, published July 29, 2010.

⁴ E. Galan, *Properties and Applications of Palygorskite-Sepiolite Clays*, 31 CLAY MINERALS 443–53 (1996). The Examiner refers to this document as “Properties and Applications” (Ans. 3; Final Act. 2)

⁵ JP 2006-151329 A, published June 15, 2006 (Partial translation).

⁶ Although the Examiner does not list this rejection in the Examiner’s Answer, the Answer does not include any “WITHDRAWN REJECTIONS” section (Ans. 3–7).

sepiolite clay fibers having fiber widths between 10–30 nm and fiber thicknesses between 5–10 nm, when incorporated into rubber (elastomer) compositions, provide mechanical and aging properties that are equal to or superior to those of kaolin clay-filled rubber compositions (*id.*). Based on these findings, the Examiner concludes that a person having ordinary skill in the art would have been prompted to combine Mizuno and Galan in the manner claimed by the Inventors in order to obtain the benefits disclosed in Galan (*id.*).

3. *The Appellant’s Contentions*

The Appellant contends that the Examiner’s rejection of claim 21 is improper because a person of ordinary skill in the art would not have substituted Galan’s sepiolite clay fibers for Mizuno’s layered kaolin clay (Appeal Br. 10–16). Specifically, the Appellant argues that although Mizuno teaches clay as an optional component, “it is but one of many sub-classifications of inorganic fillers that are described as ‘another filler’ or ‘other filler’ to be included with silica” and that “[n]owhere does Mizuno tout the use of a clay filler over the other disclosed inorganic fillers for a clinch apex rubber composition”—i.e., the composition that corresponds to the Inventors’ antiabrasive strip (*id.* at 11). The Appellant urges that, therefore, Galan’s sepiolite clay and Mizuno’s kaolin clay are not functional equivalents (*id.* at 11–12).

In addition, the Appellant argues that Galan’s sepiolite clay fibers are not interchangeable with Mizuno’s layered kaolin clay because, contrary to the Examiner’s basis for substituting Galan’s sepiolite clay for Mizuno’s kaolin clay (i.e., improved mechanical), Mizuno teaches that the “‘other fillers,’ such [as] kaolin clay, are not associated with improving mechanical

properties in its clinch apex rubber compositions” (*id.* at 12–13). In the Appellant’s view, Mizuno teaches that “it is the silica component and not the ‘other fillers,’ such as kaolin clay, that exert the mechanical ‘reinforcing effect’ in its clinch apex rubber compositions” and that the “other fillers,” such as kaolin clay, are added to improve processability—not mechanical properties (*id.* at 13–14 (relying on Inventor Luca Giannini’s Declaration filed June 20, 2013 (“Second Declaration” or “Second Decl.”) ¶¶ 9–10)). The Appellant argues that Mizuno describes a structurally different clay (i.e., layered clay) than that described in Galan (i.e., fibrous clay) for a different purpose (i.e., improved processability) than that described in Galan (i.e., improved mechanical properties) (*id.* at 14–15) and that, in view of the functional and structural differences, “a person of ordinary skill in the art would expect substitution to cause unforeseeable consequences on the processability of Mizuno’s compositions” (*id.* at 15–16).

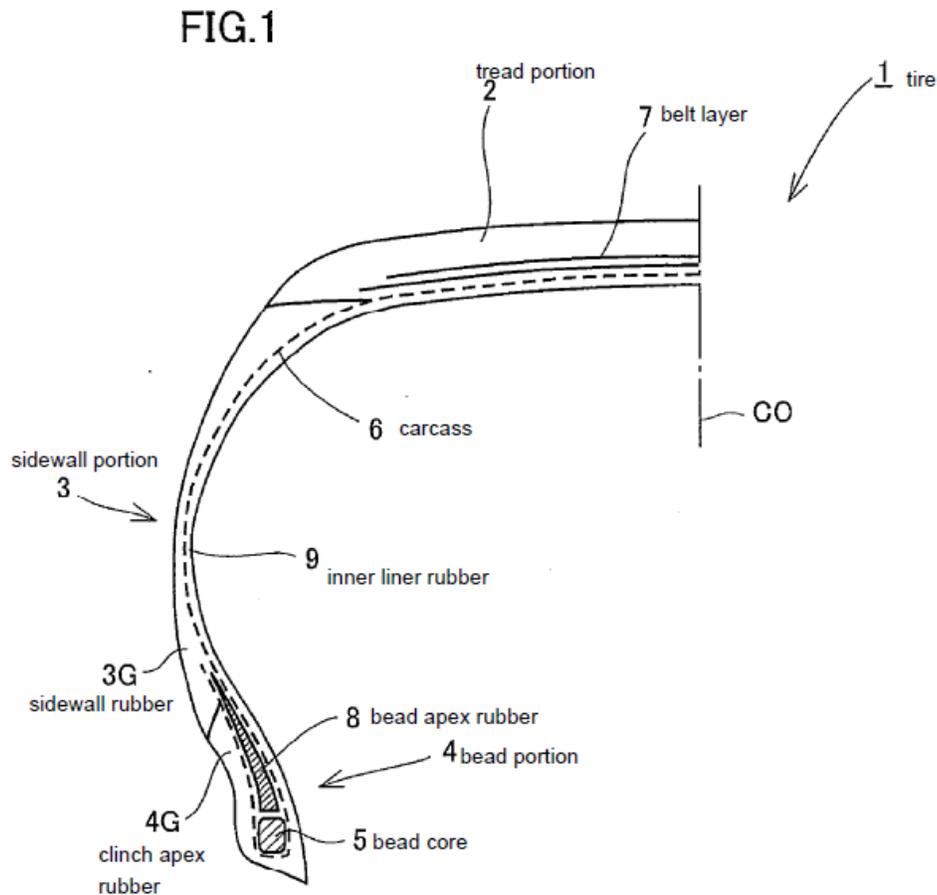
Furthermore, the Appellant contends that neither Mizuno nor Galan would have taught or suggested a crosslinked elastomeric material having the properties recited in claim 21 (*id.* at 16–17). According to the Appellant, inherency may not be established by probabilities or possibilities (*id.* at 17).

The Appellant argues that, even if a *prima facie* case of obviousness exists, it is rebutted by evidence of unexpected results (*id.* at 16). In support, the Appellant relies on certain experimental evidence described in the Inventors’ Specification and Inventor Giannini’s two declarations—namely, a Declaration filed January 12, 2018 (“First Declaration” or “First Decl.”) and the Second Declaration (*id.* at 18–26).

4. *Opinion*

The Appellant’s arguments fail to identify reversible error in the Examiner’s rejection. *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011).

Mizuno’s Figure 1 (annotated) is reproduced, as follows:



Mizuno’s Figure 1 depicts a cross-sectional view showing a left half portion of a pneumatic tire **1** comprising a tread portion **2**, a sidewall portion **3**, a sidewall rubber **3G**, a bead portion **4**, a clinch apex rubber **4G**, a bead core **5**, a carcass **6**, a belt layer **7**, a bead apex rubber **8**, and an inner liner rubber **9** (Mizuno ¶¶ 27–28). As the Appellant acknowledges (Appeal Br. 10, n.2), Mizuno’s clinch apex rubber **4G** corresponds to the “antiabrasive strip” recited in claim 21. Mizuno teaches that the clinch apex rubber **4G**

composition uses a natural rubber component consisting of either natural rubber or epoxidized natural rubber, with smaller amounts of compounded carbon black such that materials derived from petroleum resources are reduced, thereby resulting in a low heat-generating characteristic and superior processability (*id.* ¶ 30). Mizuno further teaches that the clinch apex rubber composition **4G** includes an inorganic filler preferably blended in an amount ranging from 50–80 parts by mass relative to 100 parts by mass of the rubber composition, wherein, in an embodiment, the filler includes (in addition to carbon black) silica in a preferred range from 30–55 parts by mass per 100 parts by mass of the rubber composition and an inorganic filler other than silica (“other fillers”) in a preferred range from 20 parts by mass per 100 parts by mass of the rubber composition (*id.* ¶¶ 39–42, 47–50).

With respect to the inorganic filler other than silica (i.e., “other fillers”), Mizuno teaches that “examples thereof include calcium carbonate, aluminum hydroxide, *clay*, mica and magnesium oxide” (*id.* ¶ 46 (emphasis added)), wherein “the clay to be used . . . *typically* refers to particles *mainly* composed of clay minerals having a particle size of 2 μm ” and “the clay minerals *typically* mean crystalline or amorphous materials *mainly* composed of layer-state silicates” (*id.* ¶ 48 (emphases added)). Mizuno specifically identifies wet kaolin subject to treatment by a coupling agent as a specific example (*id.* ¶ 49).

Thus, as the Examiner correctly finds (Ans. 3), Mizuno discloses only five options for the secondary filler component—one option being clay. Therefore, the Appellant is not entirely accurate in asserting that clay “is but one of *many* sub-classifications of inorganic fillers that are described as

‘another filler’ or ‘other filler’ to be included with silica” (Appeal Br. 11 (emphasis added)). *Cf. Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1364–65 (Fed. Cir. 2012) (“strong case of obviousness” exists where the combination of ingredients recited in the claims were based on selections from a finite number of identified, predictable solutions).

As indicated above, the Appellant argues that “[n]owhere does Mizuno tout the use of a clay filler over the other disclosed inorganic fillers for a clinch apex rubber composition” (Appeal Br. 11). But Mizuno teaches that any of the five options, including clay, makes it “possible to desirably obtain the reducing effect of the amount of use of materials derived from petroleum resources, with superior mechanical strength being maintained” (Mizuno ¶ 47). Therefore, each of these five options would have reasonably been expected to provide these advantages. In any event, although “case law does not require that a particular combination must be the preferred, or the most desirable, combination described in the prior art in order to provide motivation for the current invention” (*In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004)), Galan provides direct motivation or reason to substitute Mizuno’s clay (e.g., kaolin clay) with another species of clay—namely, sepiolite clay having the characteristics recited in claim 21.

Specifically, Galan teaches a palygorskite-sepiolite group of clay minerals, which were recited in canceled claim 28 as filed with the current application, have a wide range of industrial applications including as reinforcing fillers in rubber (e.g., natural rubber) compositions (Galan Abstract, 445, 448). Galan teaches that these fillers are fibers having sizes that “vary widely but generally range from *c.* 100 Å [10 nm] to 4–5 µm [4,000–5,000 nm] in length, *c.* 100 Å [10 nm] to *c.* 300 Å [30 nm] in width

and *c.* 50 Å [5 nm] to *c.* 100 Å [10 nm] in thickness” (*id.* at 443–44).

According to Galan, another prior art document “compared the behaviour of different sepiolite-filled rubbers with that of kaolin and found the mechanical properties and ageing characteristics of the sepiolite rubbers to be similar or better than those of the kaolin-filled products” (*id.* at 448).

Given these teachings, we are in complete agreement with the Examiner that a person having ordinary skill in the art would have been prompted to substitute Mizuno’s kaolin clay filler with Galan’s palygorskite-sepiolite clay with a reasonable expectation of improving the rubber composition’s mechanical and aging properties. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007) (“[W]hen a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result.”).

We find no persuasive merit in the Appellant’s argument, based on Inventor Giannini’s Second Declaration (¶¶ 9–11 (citing Mizuno ¶ 135; Table 1 (Examples 1, 2, and 4))), that Mizuno does not teach adding clay to affect mechanical properties but rather to affect processability. Contrary to the testimony of Inventor Giannini, who is an interested party, but consistent with the Examiner’s position (Ans. 4–5), Mizuno explicitly teaches that clay plays a major role in reducing the amount of materials derived from petroleum resources and making it “possible to prevent degradation in the processability that occurs when a large amount of silica is used” while maintaining “superior mechanical strength” (Mizuno ¶¶ 40, 42 (“the compounding amount [of silica] exceeding 55 parts by mass tends to cause degradation in the processability”), 47). For instance, in comparing the

Mooney viscosities reported for the natural rubber/epoxidized natural rubber compositions of Examples 2 and 4, the Mooney viscosity was 82 when 70 parts by weight of silica was used, whereas the Mooney viscosity was only 74 when only 50 parts of silica and 20 parts clay were used (*id.* ¶ 117, Table 1). To the extent that the composition containing 20 parts of clay had a lower Mooney viscosity, such a viscosity may be attributed to a reduction in the amount of silica, as disclosed elsewhere in Mizuno—not that the particular clay component affects processability. In any event, Galan explicitly teaches that fibrous palygorskite-sepiolite clay provides an improvement in terms of mechanical properties when used as a filler in a natural rubber composition, as we found above. Therefore, we do not credit Inventor Giannini’s testimony as persuasively establishing a lack of motivation to combine Mizuno and Galan. *Velandar v. Garner*, 348 F.3d 1359, 1371 (Fed. Cir. 2003) (“In giving more weight to prior publications than to subsequent conclusory statements by experts, the Board acted well within [its] discretion.”); *Yorkey v. Diab*, 601 F.3d 1279, 1284 (Fed. Cir. 2010) (The Board has discretion to give more weight to one item of evidence over another “unless no reasonable trier of fact could have done so”); *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004) (“[T]he Board is entitled to weigh the declarations and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations.”).

With respect to the Appellant’s argument concerning the properties recited in claim 21 (dynamic modulus E' value at 70°C and a frequency of 10 Hz of higher than about 8.00 MPa and a static load at 100% elongation equal to or higher than 5 MPa), Mizuno’s composition containing clay is

compositionally and structurally similar to the composition recited in claim 21, and, therefore, would be expected to possess similar properties. As the Examiner has no means to obtain and compare products, the burden of production was shifted to the Appellant to show otherwise. *In re Best*, 562 F.2d 1252, 1255 (CCPA 1977).

Here, the Appellant fails to direct us to sufficient evidence that Mizuno's compositions would not exhibit comparable dynamic modulus E' and static load at 100% values. As the Examiner correctly observes (Ans. 6), the specified values may be achieved even without the use of sepiolite clay (Spec. 23, 26 (Tables 1 and 2, Sample 2)). Moreover, our reviewing court has stated:

[I]t is not necessary . . . that both a structural similarity between a claimed and prior art compound (or a key component of a composition) be shown and that there be a suggestion or expectation from *the prior art* that the claimed compound or composition will have the same or a similar [property] *as one newly discovered by applicant*.

In re Dillon, 919 F.2d 688, 693 (Fed. Cir. 1990) (en banc).

Lastly, the Appellant's arguments based on unexpected results are also unpersuasive. First, as the Examiner correctly points out (Ans. 6), the Inventors' premise that the sepiolite clay imparts unexpectedly improved tire performance, as disclosed in the Specification (Spec. 2, l. 22–3, l. 17), is not supported by any experimental evidence. *In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997) (“Mere argument or conclusory statements in the specification does not suffice.” (Internal citation omitted)).

Second, none of the experiments in the Specification or the two Declarations from Inventor Giannini constitute a back-to-back comparison of the claimed invention against the closest prior art, Mizuno, which shows a

composition containing 70 parts by weight of natural rubber, 30 parts epoxidized natural rubber, 50 parts silica, and 20 parts clay (Mizuno ¶ 117, Table 1, Example 4). *In re Dunn*, 349 F.2d 433, 439 (CCPA 1965) (“While we do not intend to slight the alleged improvements, we do not feel it an unreasonable burden on appellants to require comparative examples relied on for non-obviousness to be truly comparative. The cause and effect sought to be proven is lost here in the welter of unfixed variables.”).

Third, the Appellant’s proffered showing is limited in scope to compositions based on 70 parts by weight natural rubber, 30 parts by weight polybutadiene rubber, various amounts of carbon black, and sepiolite clay modified with a quaternary ammonium salt (Spec. 23, Table 1; First Decl. ¶ 12 (Table 3-1); Second Decl. ¶ 14 (Table 4-1)). By contrast, claim 21 is significantly broader in that it recites any “crosslinked elastomeric material” of any rubber (elastomer) composition, any “additional reinforcing filler,” a broad range of elastic dynamic modulus E' values, and a broad range of static load at 100% elongation. *See, e.g., In re Grasselli*, 713 F.2d 731, 743 (Fed. Cir. 1983) (“With respect to appellants’ broad claims to a catalyst with ‘an alkali metal,’ the experiments detailed in Friedrich III, being limited to sodium only, are not commensurate in scope, and are, therefore, insufficient to rebut the prima facie case.”). Alternatively, claim 21 should have been narrowed to be commensurate in scope with the proffered showing. *In re Harris*, 409 F.3d 1339, 1344 (Fed. Cir. 2005).

Fourth, the improved mechanical properties appear to be expected in view of Galan’s disclosure that sepiolite clay would provide improved mechanical properties. “Expected beneficial results are evidence of obviousness of a claimed invention, just as unexpected beneficial results are

evidence of unobviousness.” *In re Skoll*, 523 F.2d 1392, 1397 (CCPA 1975).

Therefore, on balance, we conclude that the preponderance of the evidence supports the Examiner’s conclusion of obviousness. For the reasons given above, and those well-stated by the Examiner, we uphold the Examiner’s rejection.

IV. CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed	New Ground
21–27, 31, 33–46	103(a)	Mizuno, Galan	21–27, 31, 33–46		21–27, 31, 33–46
42, 43	103(a)	Mizuno, Galan, Yoshioka	42, 43		42, 43
Overall Outcome			21–27, 31, 33–46		21–27, 31, 33–46

V. FINALITY AND RESPONSE

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b). 37 C.F.R. § 41.50(b) provides “[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review.”

37 C.F.R. § 41.50(b) also provides that the Appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

Appeal 2019-004710
Application 14/430,403

(1) *Reopen prosecution.* Submit an appropriate amendment of the claims so rejected or new Evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the prosecution will be remanded to the examiner. . . .

(2) *Request rehearing.* Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

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; 37 C.F.R. § 41.50(b)