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EXAMINER
KUGEL, TIMOTHY J

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INNOPHOS, INC.
Requester

v.

Patent of
ICL PERFORMANCE PRODUCTS, LP
Patent Owner and Appellant

Appeal 2016-006596
Reexamination Control 95/002,272
Patent 7,678,467 B2
Technology Center 3900

Before ROMULO H. DELMENDO, RICHARD M. LEBOVITZ, and JEFFREY B. ROBERTSON, *Administrative Patent Judges*.

ROBERTSON, *Administrative Patent Judge*.

DECISION ON APPEAL

Patent Owner ICL Performance Products, LP ("Patent Owner") appeals the Examiner's decision under 35 U.S.C. §§ 134(b) and 315(a) to reject claims 10-16, 18, 24, 25, 27, 28, 32-39, 44, 45, 47, 48, 50, 51, and 53-94.[1, 2] Third-Party Requester Innophos, Inc. (hereinafter "Requester") urges that the Examiner's decision must be affirmed.[3] We have jurisdiction under 35 U.S.C. §§ 134(b) and 315(a).

We AFFIRM the Examiner's decision to reject claims 10-16, 18, 24, 25, 27, 28, 32-39, 44, 45, 47, 48, 50, 51, and 53-94.

STATEMENT OF THE CASE

United States Patent 7,678,467 B2 (hereinafter the "'467 Patent"), which is the subject of the current *inter partes* reexamination, issued to Falkiewicz et al. on March 16, 2010. A request for *inter partes* reexamination was filed by Requester on September 14, 2012.

We heard oral argument in this appeal on September 28, 2016 from both Patent Owner and Requester, a transcript of which was entered into the electronic record on October 26, 2016.

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[1] *See* Patent Owner's Supplemental Appeal Brief 4-6 (filed September 29, 2015) (hereinafter "App. Br."); Patent Owner's Rebuttal Brief (filed December 31, 2015) (hereinafter "Reb. Br."); Examiner's Answer (mailed December 1, 2015) (hereinafter "Ans."); Right of Appeal Notice (mailed May 29, 2015) (hereinafter "RAN.").

[2] Claims 1-19 were issued, with claims 20-94 having been added during the course of reexamination. Claims 1-9, 17, 19-23, 26, 29-31, 40-43, 46, and 49 have been cancelled. (*See* RAN 1.)

[3] *See* Requester's Respondent Brief (filed October 29, 2015) (hereinafter "Resp't Br.").

The ’467 Patent describes methods for making asphalt roofing materials comprising polyphosphoric acid additives. (’467 Patent, col. 1, ll. 7-12.) Claim 24, which is illustrative of the appealed subject matter, reads as follows:

> 24. In a process for manufacturing an asphalt shingle comprising: an organic felt or fiberglass mat; a first layer of a chemically-modified, air-blown asphalt and a second layer of a chemically-modified, air-blown asphalt, wherein the mat is coated on its top surface by one of the layers of chemically-modified, air-blown asphalt and the mat is coated on its bottom surface by the other layer of chemically-modified, air-blown asphalt; and a surfacing material embedded into the surface, that is opposed to the mat, of at least one of the chemically-modified, air-blown asphalt layers;
>
> the improvement comprises using a chemically-modified, air-blown asphalt that is formed by a process for modifying an asphalt that comprises air blowing the asphalt and mixing polyphosphoric acid having an H_3PO_4 equivalent concentration of at least about 105% with the asphalt before the air blowing, during the air blowing, or a combination thereof to form the chemically-modified, air-blown asphalt.

(PO App. Br. 37, Claims App’x.)

Independent claims 44 and 47 are similar to claim 24 in that each recites an improvement in a process for manufacturing an asphalt shingle. Independent claims 27, 45, and 48 recite methods of increasing the tear strength of an asphalt shingle, where the methods comprise mixing polyphosphoric acid into the asphalt, where the polyphosphoric acid has similar limitations as claims 24, 44, and 47.

THE REJECTIONS

There are twenty-one grounds of rejection under 35 U.S.C. § 103(a) which are appealed by Patent Owner. There are three primary references, namely, Shepard,[4] Graham,[5] and Cullen,[6] which are each cited for the basic structure of asphalt shingles recited in the claims. Each primary reference is combined with the same set of additional references, namely Trumbore,[7] which is relied upon to support the obviousness of utilizing air-blown asphalts; Hoiberg,[8] which is relied upon to support the obviousness of the addition of polyphosphoric acids to asphalt; and Rhône-Poulenc[9] to support the commercial availability of mixtures of polyphosphoric acids. Alexander,[10] and Ho,[11] Patent Owner's alleged admissions (APA),[12] are also cited to support the particular concentration of polyphosphoric acids recited in the claims, and Moran[13] is cited to support the obviousness of the addition of polymer modifiers to asphalt (*see*, e.g., claim 14).

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[4] U.S. Patent No. 3,931,440, issued on January 6, 1976.
[5] U.S. Patent No. 4,895,754, issued on January 23, 1990.
[6] Cullen, William, "The Evolution of Asphalt Shingles: Survival of the Fittest?" Professional Roofing, R4-R8, June 1992.
[7] Trumbore, David, "The Magnitude and Source of Air Emissions from Asphalt Blowing Operations," Environmental Progress, Vol. 17, No. 1, Spring 1998.
[8] U.S. Patent No. 3,028,249, issued April 3, 1962.
[9] Phosphoric Acid, Rhône-Poulenc Basic Chemicals Co. (1992).
[10] U.S. Patent No. 3,751,278, issued August 7, 1973.
[11] Ho, Susanna, et al., "Impact of Chemical Modification on the Composition and Properties of Asphalt Binders," Canadian Technical Asphalt Association, 2001.
[12] '467 Patent, col. 4, l. 45– col. 5, l. 2. (*See* RAN 38.)
[13] U.S. Patent No. 4,882,373, issued November 21, 1989.

The specific combinations of publications and admissions cited under 35 U.S.C. § 103(a) from which Patent Owner appeals are summarized below with reference to the numbered rejections adopted and referred to by the Examiner, Patent Owner, and Requester:

Rejections 19, 20, and 21: Claims 10-13, 18, 24, 25, 27, 28, 32-39, 44, 45, 47, 48, 50, 51, 53-62, 66-82, and 86-94 as obvious over Shepard, Graham, or Cullen, in view of Trumbore, Hoiberg, and Rhône-Poulenc;

Rejections 22, 24, and 26: Claims 10-16, 18, 24, 25, 27, 28, 32-39, 44, 45, 47, 48, 50, 51, 55-65, 67-73, 75-85, and 87-93 as obvious over Shepard, Graham, or Cullen, in view of Trumbore, Hoiberg, Rhône-Poulenc, Moran, and APA;

Rejections 23, 25, and 27: Claims 10-13, 18, 24, 25, 27, 28, 32-39, 44, 45, 47, 48, 50, 51, 53-62, 66-82, and 86-94 as obvious over Shepard, Graham, or Cullen, in view of Trumbore, Hoiberg, Rhône-Poulenc, and APA;

Rejections 28, 32, and 36: Claims 10-16, 18, 24, 25, 27, 28, 32-39, 44, 45, 47, 48, 50, 51, 55-65, 67-73, 75-85, and 87-93 as obvious over Shepard, Graham, or Cullen, in view of Trumbore, Hoiberg, Rhône-Poulenc, Moran, and Alexander;

Rejections 29, 33, and 37: Claims 10-16, 18, 24, 25, 27, 28, 32-39, 44, 45, 47, 48, 50, 51, 55-65, 67-73, 75-85, and 87-93 as obvious over Shepard, Graham, or Cullen, in view of Trombore, Hoiberg, Rhône-Poulenc, Moran, and Ho;

Rejections 30 and 38: Claims 10-13, 18, 24, 25, 27, 28, 32-39, 44, 45, 47, 48, 50, 51, 53-62, 66-82, and 86-94 as obvious over Shepard or Cullen, in view of Trumbore, Hoiberg, Rhône-Poulenc, and Alexander;

Rejections 31 and 39: Claims 10-13, 18, 24, 25, 27, 28, 32-39, 44, 45, 47, 48, 50, 51, 53-62, 66-82, and 86-94 as obvious over Shepard or Cullen, in view of Trumbore, Hoiberg, Rhône-Poulenc, and Ho;

Rejection 34: Claims 10-16, 18, 24, 25, 27, 28, 32-39, 44, 45, 47, 48, 50, 51, 55-65, 67-73, 75-85, and 87-93 as obvious over Graham in view of Trumbore, Hoiberg, Rhône-Poulenc, and Alexander; and

Rejection 35: Claims 10-16, 18, 24, 25, 27, 28, 32-39, 44, 45, 47, 48, 50, 51, 55-65, 67-73, 75-85, and 87-93 as obvious over Graham in view of Trumbore, Hoiberg, Rhône-Poulenc, and Ho.

(App. Br. 4-6.)

Patent Owner additionally relies on the following declaration evidence of record:

Declaration of Dr. Rene Maldonado under 37 C.F.R. § 1.132 executed on October 22, 2014 (the "Maldonado Declaration") (App. Br., Exh. A); and

Declaration of Dr. Laurand Lewandowski under 37 C.F.R. § 1.132 executed on December 8, 2009 (the "Lewandowski Declaration") (App. Br., Exh. B).

Requester relies on the following declaration evidence of record:

Declaration of Jean-Valery Martin under 37 C.F.R. § 1.132 executed on January 10, 2013 (the "1st Martin Declaration") (Resp't Br. Exh. I); and

Second Declaration of Jean-Valery Martin under 37 C.F.R. § 1.132, executed on November 22, 2014 (the "2nd Martin Declaration") (Resp't Br. Exh. J).

Rejections 19-21

ISSUE

The Examiner found that the combination of Shepherd, Graham, and Cullen in view of Trumbore discloses air-blown asphalt compositions, but does not disclose mixing polyphosphoric acid into the asphalt as required by all the rejected claims. (RAN 29, 32, 35.) The Examiner found that Hoiberg discloses polyphosphoric acid catalysts results in asphalts having higher than normal penetration values at a given softening point. (RAN 29-30, 32, 35.) The Examiner also found that Rhône-Poulenc discloses the commercial availability of polyphosphoric acids with an H_3PO_4 equivalent up to 118.74% and containing chain lengths up to 14. (RAN 30, 32, 35.) The Examiner concluded that it would have been obvious to catalyze the asphalt processes of Shepherd, Graham, and Cullen in view of Trumbore with polyphosphoric acid as taught by Hoiberg and Rhône-Poulenc, in order to obtain the advantages disclosed in Hoiberg. (RAN 30, 33, 35.)

Patent Owner contends that Hoiberg discloses a large genus of phosphorous acids, such that Hoiberg does not direct one of ordinary skill in

the art to polyphosphoric acid having the particular grades recited in the claims. (App. Br. 18-19.)[14]

Patent Owner contends that the claimed methods provide unexpectedly improved tear strength. (App. Br. 10.) Patent Owner argues that the tear strength data presented in the '467 Patent provides a comparison with the closet prior art and is commensurate in scope with the claims. (*Id*.) Patent Owner argues that the closest prior art to the claims are Shepard, Graham, and Cullen, and not Hoiberg, because the former prior art discloses asphalt roofing shingles, while Hoiberg does not. (App. Br. 8, 9, 12-15.) In addition, Patent Owner contends that a person of ordinary skill in the art would understand that polyphosphoric acids across a range of the concentrations recited in the claims would exhibit similar properties and provide the improvement in tear strength. (Reb. Br. 4.)

Requester argues that the '467 Patent does not provide tear strength test results that are commensurate in scope with the claims. (Resp't Br. 4, 9.) Requester's position is that the '467 Patent tests only one concentration of polyphosphoric acid, whereas the claims encompass many concentrations of polyphosphoric acid. (Resp't Br. 4-5.) Requester contends also that the reported test results were not unexpected, because similar to the '467 Patent, Hoiberg discloses that the addition of polyphosphoric acid increases penetration value at a given softening point. (Resp't Br. 6.) Requester

[14] Patent Owner argued additionally that pyrophosphoric acid as disclosed in Hoiberg is not a species of polyphosphoric acid recited in the claims. (App. Br. 18.) However, during oral argument, Patent Owner's counsel stated that Patent Owner was no longer contesting that point. (Or. Hr'g Tr. 7, ll. 14-21.)

argues that Hoiberg is the closest prior art to the claims in the '467 Patent. (Resp't Br. 7-9.)

Regarding Hoiberg, Requester contends that even if Hoiberg's disclosure of "stable acids of phosphorus" discloses a genus, the further disclosure of pyrophosphoric acid is a species that meets the limitations of the claims. (Resp't Br. 11-12.)

Accordingly, the dispositive issue on appeal is: considering the evidence of record as a whole, would it have been obvious to use polyphosphoric acid in air-blown asphalt in manufacturing an asphalt shingle in the concentrations set forth in the claims and would the result of doing so have been unexpected by one of ordinary skill in the art?

FINDINGS OF FACT ("FF")

1. Trumbore discloses that air-blown asphalt is a commercial product used in the manufacture of asphalt shingles and roof construction. (P. 53.)
2. Trumbore concludes that the emissions factors for asphalt compositions "current" at the time of its publication do not take into account sulfur oxide and hydrogen chloride, and overestimate the emissions of particulate and carbon monoxide. (P. 59.)
3. Hoiberg discloses that asphalts "are primarily used for coatings for road surfaces, protective coatings for metal surfaces and as roofing compositions." (Col. 1, ll. 12-14.)

4. Hoiberg discloses that asphalts can be modified by processing techniques such as air-blowing asphalt in the presence of a phosphorus containing catalyst, where the catalyst is: "stable acids of phosphorus, such as orthophosphoric acid and pyrophosphoric acid, phosphorus pentoxide, red phosphorus, and the stable sulfides of phosphorus, such as phosphorus sesquisulfide, phosphorus sulfide and phosphorus pentasulfide." (Col. 1, ll. 27-36.)
5. Hoiberg discloses that "asphalts produced by this technique are characterized by higher than normal penetration values at a given softening point and as a result find use in applications in which the usual untreated asphalts have no commercial utility." (Col. 1, ll. 42-46.)
6. Rhône-Poulenc discloses that for polyphosphoric acids, the P_2O_5 content controls the phosphoric acid constituent composition at equilibrium. (P. 22.)
7. Rhône-Poulenc discloses that polyphosphoric acids having P_2O_5 content above 75.7% contain both triphosphoric and tetraphosphoric acid. (P. 25, Table 22.)
8. Rhône-Poulenc discloses:

Phosphoric acid of 105% concentration theoretically freezes at 16 ºC (60.8 ºF). A heating source and insulation for tanks and piping should be provided as for 85% phosphoric acid. In addition the tank should be enclosed and the vent equipped with a dryer to prevent moisture absorption.

115% Phosphoric Acid: Polyphosphoric acid (115% H_3PO_4) will not freeze in the ordinary sense. However, it is so

> viscous that it must be maintained above 75 °C (167ºF) for easy handling and flowability.
>
> (p. 6, col. 1.)

PRINCIPLES OF LAW

"In order to establish unexpected results for a claimed invention, objective evidence of non-obviousness must be commensurate in scope with the claims which the evidence is offered to support." *In re Clemens*, 622 F.2d 1029, 1035 (CCPA 1980). Finding the claim scope broad, and the "probative value of appellants' evidence . . . quite narrow," the court concluded this "is not a case in which the probative value of a narrow range of data can be reasonably extended to prove the unobviousness of a broader claimed range." *Id*. at 1036. *Cf. In re Kollman*, 595 F.2d 48, 56 (CCPA 1979) (where it was held that the nonobviousness of a broader claimed range was proven by a narrower range of data, when one having ordinary skill in the art could "ascertain a trend in the exemplified data which would allow him to reasonably extend the probative value thereof."). Such a showing must be based on evidence, not argument or speculation. *In re Mayne*, 104 F.3d 1339, 1343-44 (Fed. Cir. 1997); *In re Schulze*, 346 F.2d 600, 602 (CCPA 1965).

"[W]hen unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art." *In re Baxter Travenol Labs*., 952 F.2d 388, 392 (Fed. Cir. 1991)

ANALYSIS

After careful review of the evidence of record, we agree with the Examiner that the claimed processes would have been obvious to one of ordinary skill in the art. Initially, we observe that claim 24 on appeal is written in Jepson format, and therefore admits that air-blown asphalt shingles are known in the art. *In re Fout*, 675 F.2d 297, 301(CCPA 1982). Indeed, Trumbore discloses that air-blown asphalts are known commercially, and rather than teach away from air-blown asphalts, Trumbore merely observes the inaccuracies of the emission factors relating to air-blown asphalts. (FF 1, 2.) Accordingly, Patent Owner's arguments that Trumbore teaches away from air-blowing asphalts are not persuasive. (App. Br. 16-17.)

Hoiberg discloses air-blown asphalts used in the roofing industry which, when air-blown in the presence of a phosphorus containing catalyst, are characterized by higher than normal penetration values at a given softening point. (FF 3-5.) The '467 Patent also describes such an effect. (Col. 13, ll. 27-34; "the addition of polyphosphoric acid had little or no affect on the softening point of the asphalt but it resulted in a significant increase in the penetration values and regulated the penetration values as a function of temperature, which tend to indicate that the addition of polyphosphoric acid increased the flexibility of the asphalt and the flexibility of the asphalt tended not to be affected by the decrease in temperature.")

As phosphorus containing catalysts, Hoiberg expressly names stable acids of phosphorus including pyrophosphoric acid (FF 4), which is a polyphosphoric acid having an H_3PO_4 equivalent concentration of about

110%, and meets the *unbounded* range recited in the claims ("an H_3PO_4 equivalent concentration of at least about 105%" recited in claim 24).[15] (2nd Martin Decl. para. 7; Rhône-Poulenc, Fig. 3.) Thus, Hoiberg's disclosure of pyrophosphoric acid would meet the limitation of claim 24 of "an H_3PO_4 equivalent concentration of at least about 105%." In addition, in view of the above discussion, Patent Owner's separate arguments with respect to claims 25 and 28, which recite polyphosphoric acid having an H_3PO_4 equivalent concentration of about 110%, are also not persuasive. (App. Br. 33.) Thus, although Hoiberg may disclose other phosphorus containing compounds besides the polyphosphoric acids recited in the claims, Hoiberg discloses specific polyphosphoric acids as recited in the claims as well as a reason for adding such compounds to air-blown asphalts. (FF 4, 5; 2nd Martin Decl. paras. 24-27.)

In discussing Hoiberg, the Maldonado Declaration, while admitting that Hoiberg discloses polyphosphoric acid, focuses on the disclosure in the examples of Hoiberg as allegedly disclosing dilute phosphoric acid in view of the examples disclosing 0.5% and 1.0% by weight P_2O_5 to support the position that Hoiberg does not suggest polyphosphoric acids in the concentration levels recited in the claims.[16] (Maldonado Decl. paras. 11-15.) However, the Examiner does not rely principally on the examples of

[15] According to the '467 Patent, polyphosphoric acid having a H_3PO_4 content of 105% has a P_2O_5 content of about 76.05%, which is above the 74% P_2O_5 content recited in claims 47 and 48. ('467 Patent, col. 4, ll. 63-65.)
[16] Although the '467 Patent is directed to polyphosphoric acid, we have not been directed to any evidence as to the criticality of the strength of the acid, or suggesting that "dilute" phosphoric acids would not also achieve beneficial properties consistent with the teaching of Hoiberg.

Hoiberg, but rather the general disclosure of Hoiberg as discussed above. In addition, we agree with Requester's expert that the skilled worker reading the entirety of Hoiberg would have understood that Hoiberg in disclosing 0.5% and 1.0% by weight P_2O_5, is not describing the strength of the acid, but rather the amount of P_2O_5 added to the composition. (2nd Martin Decl., paras. 22, 23.)

Regarding Rhône-Poulenc, and of particular relevance to the polyphosphoric acid limitations recited in claims 44 and 45, Patent Owner contends that because Rhône-Poulenc does not identify any industrial application for every grade of polyphosphoric acid and fails to identify that polyphosphoric acids are used in roofing applications generally, or asphalt shingles in particular, one of ordinary skill in the art would not have been led to incorporate polyphosphoric acid into asphalt shingles in view of Rhône-Poulenc. (Appeal Br. 19-21.) We are not persuaded by this argument. As discussed above, the Examiner does not rely on Rhône-Poulenc for the addition of polyphosphoric acid to roofing compositions, but rather, relies on Hoiberg for that teaching. Rhône-Poulenc is relied on for the commercial availability of other polyphosphoric acid falling within the disclosure of Hoiberg. (FF 6, 7.) Patent Owner's argument does not consider the rejection as a whole, as presented by the Examiner. (*See* Resp't Br. 12-13.)

As part of the obviousness inquiry, we consider Patent Owner's evidence of unexpected results of increased tear strength. (See *Leo Pharm. Prods., Ltd. v. Rea*, 726 F.3d 1346, 1358 (Fed. Cir. 2013).) In this regard, we agree with Patent Owner, that Shepherd, Graham, and Cullen, the asphalt

shingle references, are the closest prior art. Although Hoiberg discloses the addition of polyphosphoric acid in roofing compositions, the claims are directed to processes for manufacturing asphalt shingles, and it is undisputed that Hoiberg does not disclose asphalt shingles or their preparation. Thus, we agree with Patent Owner, that a comparison of the closest prior art is a comparison between the asphalt shingles disclosed in Shepherd, Graham, or Cullen and asphalt shingles produced by the methods recited in the claims.

However, we agree with the Examiner that the results presented are not commensurate in scope with the claims. *See In re Kollman*, 595 F.2d 48 (CCPA 1979); *In re Harris*, 409 F.3d 1339, 1344 (Fed. Cir. 2005)("[T]he record does not show that the improved performance would result if the weight-percentages were varied within the claimed ranges. Even assuming that the results were unexpected, Harris needed to show results covering the scope of the claimed range. Alternatively, Harris needed to narrow the claims.").

Specifically, Patent Owner points to an unexpected increase in tear strength in asphalt shingles as a result of the addition of polyphosphoric acid, for asphalt samples with and without filler. ('467 Patent, col. 18, ll. 11-40; Leawandowski Decl. para. 6.) However, Patent Owner only appears to have tested a polyphosphoric acid having an H_3PO_4 equivalent concentration of 115%, whereas the claims set lower limits for the polyphosphoric acid of 105% H_3PO_4 equivalent concentration (claims 24, 27), 74% P_2O_5 concentration (claims 47, 48), or recite the presence of particular species of polyphosphoric acid (claims 44, 45). ('467 Patent, col. 12, ll. 57-58.) We are not persuaded by Patent Owner's argument that one

of ordinary skill in the art would have understood that the improvements in tear strength would have been expected from polyphosphoric acids across the range of concentrations recited in the claims. (Reb. Br. 4.) Patent Owner points to Rhône-Poulenc as to allegedly providing evidence that a wide variety of properties of polyphosphoric acids were tested for polyphosphoric acid having concentrations above 105% H_3PO_4 equivalent. (Reb. Br. 4, citing Rhône-Poulenc pp. 14-25.) However, Patent Owner does not explain what the properties are and why such properties would translate to an expected increase in tear strength in the same manner over all concentrations and species embraced by the claims.

As a result, we are of the view that when the evidence in favor of obviousness is weighed against the evidence of nonobviousness, the evidence in favor of obviousness outweighs the evidence of nonobviousness. Accordingly, the Examiner's findings and conclusions are supported by a preponderance of the evidence of record.

Claims 50, 51, 67, 73, 87, and 93

Claims 50, 51, 67, 73, 87, and 93 recite that the polyphosphoric acid is warmed prior to mixing with asphalt.

The Examiner found that none of Shepherd, Trumbore, or Hoiberg disclosed warming polyphosphoric acid before mixing with asphalt, but concluded that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to store and transfer the polyphosphoric acids of the SHEPHERD, TRUMBORE and HOIBERG process at the temperatures taught by RHONE-POULENC." (RAN 31-32.) The Examiner

reasoned that Rhône-Poulenc discloses that warming "would be necessary to prevent freezing of the lower equivalent H_3PO_4 concentrations and to ease handling and improve flowability for all grades." (RAN 32, citing Rhône-Poulenc, Page 5 column 2, para. 4 - Page 6 column 1 para. 5.) Requester argues that in view of Rhône-Poulenc's disclosure, it was known to heat or warm polyphosphoric acid prior to use. (Resp't Br. 19.)

Patent Owner contends that the Examiner's findings, even if correct, do not relate to the claimed invention, because the claims require that the temperature be increased relative to the temperature that the polyphosphoric acid was stored and transferred to be warmed before mixing. (App. Br. 33-34.)

We are not persuaded by Patent Owner's argument. Rather, we agree with the Examiner and Requester that disclosure of Rhône-Poulenc provides evidence that warming polyphosphoric acid prior to addition to asphalt would have been obvious to one of ordinary skill in the art. (FF 8.) Indeed, the '467 Patent contains a similar disclosure as Rhône-Poulenc relating to the viscosity and flowability. ('467 Patent, col. 6, ll. 56-58, "the polyphosphoric acid is preferably warmed before being added to the asphalt because this decreases its viscosity, which aids flowing and mixing.")

Accordingly, we affirm the Examiner's rejections of these claims as well.

Rejections 22, 24, and 26

Regarding Rejections 22, 24 and 26, which add Moran and Patent Owner admissions, to the combinations of references cited for Rejections

19-21, the Examiner relied on Moran for the addition of polymer modifier to the claims and Patent Owner's admissions for other commercially available polyphosphoric acids. (RAN 37-39, 40-41, 42-43.)

Patent Owner does not argue the obviousness of the addition of polymer modifier to asphalt shingles, but rather contends that Moran fails to satisfy the limitations of the claims because Moran discloses phosphoric acid, and not the addition of polyphosphoric acid. (App. Br. 23.) With respect to the Patent Owner Admissions, Patent Owner contends that the proposed admissions are merely cumulative of Rhône-Poulenc. (App. Br. 23-24.) We find these arguments unpersuasive for the same reasons as discussed above for Rhône-Poulenc.

Regarding Moran, the Examiner does not rely on Moran for the addition of polyphosphoric acid to air-blown asphalt shingles. Patent Owner has not provided any persuasive argument or evidence to demonstrate error in the Examiner's findings and conclusions that it would have been obvious to add the polymer modifiers to asphalt shingles containing polyphosphoric acid as suggested by the other cited prior art references. Accordingly, we are not persuaded by Patent Owner's arguments. We affirm the Examiner's rejections as set forth in Rejections 22, 24, and 26.

Rejections 23, 25, and 27

Patent Owner relies on similar arguments as addressed above with respect to Rejections 19-22, 24, and 26. (App. Br. 24-25.) Accordingly, we affirm the Examiner's rejections for the same reasons as discussed above.

Rejections 28-39

As discussed above, the Examiner, in Rejections 28-39, adds either Alexander or Ho to the combination of Shepard, Graham, or Cullen, with Trumbore, Hoiberg, Rhône-Poulenc, and Moran. In doing so, the Examiner expressly stated that Alexander or Ho were cited "[s]hould it be decided that the combination of Hoiberg and Rhone-Poulenc do not adequately disclose the claimed polyphosphoric acid." (RAN 44, 46-49, 51-57.) Accordingly, because we have affirmed the Examiner's rejections above, which include all of the claims on appeal, we find it unnecessary to reach the remaining grounds of rejection. *See also Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984); *cf. In re Gleave*, 560 F.3d 1331, 1338 (Fed. Cir. 2009). *See also* 37 C.F.R. § 41.77 (a) ("The Patent Trial and Appeal Board … may affirm or reverse each decision of the examiner on all issues raised on each appealed claim") and *Gleave*, 560 F.3d at 1338.

DECISION

The Examiner's decision to reject claims 10-16, 18, 24, 25, 27, 28, 32-39, 44, 45, 47, 48, 50, 51, and 53-94 is affirmed.

In accordance with 37 C.F.R. § 41.79(a)(1), the "[p]arties to the appeal may file a request for rehearing of the decision within one month of the date of: . . . [t]he original decision of the Board under § 41.77(a)." A request for rehearing must be in compliance with 37 C.F.R. § 41.79(b). Comments in opposition to the request and additional requests for rehearing must be in accordance with 37 C.F.R. § 41.79(c) & (d), respectively. Under

37 C.F.R. § 41.79(e), the times for requesting rehearing under paragraph (a) of this section, for requesting further rehearing under paragraph (d) of this section, and for submitting comments under paragraph (c) of this section may not be extended.

An appeal to the United States Court of Appeals for the Federal Circuit under 35 U.S.C. §§ 141-144 and 315 and 37 C.F.R. § 1.983 for an *inter partes* reexamination proceeding "commenced" on or after November 2, 2002 may not be taken "until all parties' rights to request rehearing have been exhausted, at which time the decision of the Board is final and appealable by any party to the appeal to the Board." 37 C.F.R. § 41.81. *See also* MPEP § 2682 (8th ed., Rev. 7, July 2008).

AFFIRMED

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CITYPLACE 1
185 ASYLUM STREET
HARTFORD, CT 06103

lb