



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/870,848	06/17/2004	Sayed Ibrahim	7484-00-OC	9477
23909	7590	11/17/2016	EXAMINER	
COLGATE-PALMOLIVE COMPANY			ROBERTS, LEZAH	
909 RIVER ROAD			ART UNIT	
PISCATAWAY, NJ 08855			PAPER NUMBER	
			1612	
			NOTIFICATION DATE	
			DELIVERY MODE	
			11/17/2016	
			ELECTRONIC	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Patent_Mail@colpal.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SAYED IBRAHIM, SUMAN K. CHOPRA, and
MICHAEL PRENCIPE¹

Appeal 2015-002319
Application 10/870,848
Technology Center 1600

Before ERIC B. GRIMES, JOHN G. NEW, and KRISTI L. R. SAWERT,
Administrative Patent Judges.

NEW, Administrative Patent Judge.

DECISION ON APPEAL

SUMMARY

Appellants file this appeal under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1, 2, 14, 15, 18, 19, and 24–27² as unpatentable under 35 U.S.C. § 103(a) as being obvious over Perna (US 2003/0228264 A1, December 11, 2003) (“Perna”).

¹Appellants state the real party-in-interest is The Colgate-Palmolive Company. App. Br. 2.

² Appellants also argue in their Appeal Brief for the patentability of claims 16, 17, and 20. *See, e.g.*, App. Br. 5, 8. These claims are canceled and so we do not address their patentability. *See* Appellants' arguments made in Amendment After-Final (dated July 23, 2013).

Claims 1–12, 14, 15, 18, 19, and 24–27 also stand rejected as unpatentable under 35 U.S.C. § 103(a) as being obvious over the combination of Perna and Majeti et al. (US 2003/0124065 A1, July 3, 2003) (“Majeti”).

Claims 1–10, 12, 14, 15, 18, 19, 24, 25, and 27 also stand rejected as unpatentable under 35 U.S.C. § 103(a) as being obvious over the combination of Majeti and Krumme (CA 2 391 406 A1, May 13, 2002) (“Krumme”).

We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

NATURE OF THE CLAIMED INVENTION

Appellants’ invention is directed to a composition for delivery of an oral care substance to a dental surface upon application of the composition thereto. The composition comprises a flexible film comprising the oral care substance dispersed in a film-forming effective amount of a polymeric matrix having a hydrophilic component, e.g., vinylpyrrolidone (VP), and a hydrophobic component, e.g., vinyl acetate (VA), in a weight ratio selected such that the film is substantially dissolvable in saliva in a period of time effective for delivery of the oral care substance. Abstract.

REPRESENTATIVE CLAIM

Independent claim 1 is representative of the claims on appeal and recites:

1. A composition for delivery of an oral care substance to a dental surface upon application of the composition thereto, the composition comprising

the oral care substance dispersed in a film-forming effective amount of a polymeric matrix,

the matrix having a hydrophilic component and a hydrophobic component in a weight ratio selected such that the matrix is dissolvable in saliva in a period of time effective for delivery of the oral care substance,

wherein the polymeric matrix constitutes 25% to about 90% by weight of the composition, and

wherein the composition is in the form of a film that is substantially dissolvable in saliva in about 5 to about 60 minutes;

wherein the oral care substance is a whitening agent selected from the group consisting of peroxy compounds, chlorine dioxide, chlorites and hypochlorites and is present in a total hydrogen peroxide equivalent amount of about 0.1 % to about 50% by weight.

App. Br. 16.

The Examiner has required Appellants to elect a single chemical species for examination. App. Br. 3. The issue on appeal is the patentability of the single elected species, which recites :

A composition for delivery of an oral care substance to a dental surface upon application of the composition thereto, the composition comprising

the oral care substance dispersed in a film-forming effective amount of a polymeric matrix,

the matrix having *vinylpyrrolidone* as the monomer of the polymerized hydrophilic component and *vinyl acetate* as the monomer of the polymerized hydrophobic component in a weight ratio selected such that

the matrix is dissolvable in saliva in a period of time effective for delivery of the oral care substance,

wherein the polymeric matrix constitutes 25% to about 90% by weight of the composition, and

wherein the composition is in the form of a film that is substantially dissolvable in saliva in about 5 to about 60 minutes;

wherein the oral care substance is a whitening agent that is *sodium percarbonate* and is present in a total hydrogen peroxide equivalent amount of about 0.1 % to about 50% by weight.

Id. at 4 (emphasis added).

ISSUES AND ANALYSES

We agree with, and adopt, the Examiner's findings and conclusion that the appealed elected species would have been obvious over the cited prior art references. We address below the arguments raised by Appellants.

A. The rejection of Claims 1, 2, 14, 15, 18, 19, and 24–27 over Perna

Issue 1

Appellants argue that the Examiner erred in finding that Perna teaches or suggests all of the limitations of the elected species. App. Br. 5.

Analysis

Appellants argue Perna neither teaches nor suggests the following elements of Appellants' elected species: (1) film-forming effective amount

of a polymeric matrix; (2) the polymeric matrix having vinylpyrrolidone as the monomer of the polymerized hydrophilic component and vinyl acetate as the monomer of the polymerized hydrophobic component; and (3) the polymeric matrix constitutes 25% to about 90% by weight of the composition. App. Br. 5. Appellants assert Perna neither teaches nor suggests that its matrix is polymeric (i.e., made from repeating monomeric units). *Id.* Further, assert Appellants, even if the dissolvable matrix taught by Perna could be made from a combination of cellulose and acrylic polymer, that itself does not mean that the matrix itself is polymeric (i.e., made from repeating monomeric units). *Id.* (citing Perna ¶ 27).

Furthermore, Appellants contend, Perna neither teaches nor suggests that its dissolvable matrix itself is composed of vinylpyrrolidone as the monomer of the polymerized hydrophilic component and vinyl acetate as the monomer of the polymerized hydrophobic component. App. Br. 6.

Appellants dispute the Examiner's finding that Perna's matrix includes thickeners such as poly-(vinylpyrrolidone-co-vinyl acetate) and humectants such as polyethylene glycol to obtain a polymer matrix of 25% by weight. App. Br. 6 (citing Final Act. 5). Appellants argue that there is nothing to indicate that the poly-(vinylpyrrolidone-co-vinyl acetate) added as a thickener and polyethylene glycol added as a humectant would together form a polymeric matrix. *Id.*

According to Appellants, "polymeric," by definition, means that there are repeating monomeric units. *Id.* Appellants contend Perna's thickeners and humectants are simply additions to Perna's dissolvable matrix as opposed to a repeating part of the actual matrix structure itself. *Id.* By contrast, argue

Appellants, in their elected species the matrix is polymeric and made of repeating vinylpyrrolidone and vinyl acetate monomeric units. *Id.*

Appellants argue further that the Examiner's reliance on the 5% weight addition of polyethylene glycol humectant to obtain a polymer matrix of 25% by weight is improper because it does not address the patentability of Appellants' elected species in which the "25% to about 90% by weight" limitation applies to the polymeric matrix which, Appellants contend, is made solely of vinylpyrrolidone and vinyl acetate. App. Br. 6. Appellants contend this limitation applies strictly to the polymeric matrix made of vinylpyrrolidone as the monomer of the polymerized hydrophilic component and vinyl acetate as the monomer of the polymerized hydrophobic component. *Id.*

The Examiner responds that Perna teaches a film comprising polymers which form the film, and therefore teaches film-forming effective amounts of a polymeric matrix. Ans. 8. The Examiner finds Perna also teaches addition of thickeners, including polyvinyl pyrrolidone and poly(vinyl pyrrolidone-co-vinyl acetate). *Id.*

The Examiner finds Appellants' Specification discloses that the polymerized vinylpyrrolidone and polymerized vinyl acetate may be present as homopolymers, meaning that the matrix may be a mixture of different polymers. Ans. 8. The Examiner does not agree with Appellants' contention that the matrix can only comprise the one polymer, rather the Examiner finds the claims read on a mixture of polymers. *Id.*

The Examiner also finds polyethylene glycol and poly(vinylpyrrolidone-co-vinyl acetate) are both polymers, with repeating units, and therefore when several polymers are mixed together, they meet the

limitation of a polymer matrix. Ans. 9. The Examiner finds Appellants' Specification provides no definition or guidance as to how the polymer matrix of the instant claims would differ from a mixture of polymers that form a film, as taught by Perna. *Id.*

Finally, the Examiner finds the claims recite a polymer matrix "having" a hydrophilic component and a hydrophobic component. Ans. 9. The Examiner therefore finds the compositions of Perna meet the limitations of the claims. *Id.* at 9–10. The Examiner also finds the dependent claims recite that both the hydrophilic and hydrophobic components "comprise" specific monomers. *Id.* at 10. The Examiner points out that the claim term "comprise" does not limit the matrix to those monomers and, therefore, the recited monomers or polymers do not have to comprise at least 25%. *Id.* Other monomers and polymers could be added, the Examiner finds, to reach 25%. *Id.*

We are not persuaded by Appellants' argument. As an initial matter, Appellants' Specification provides no explicit definition of the claim term "matrix." However, the Specification provides descriptions of embodiments that are illuminating in their description. For example, Appellants describe an embodiment of a matrix of their invention in which:

[T]he polymeric matrix comprises polymerized vinylpyrrolidone (VP) and vinyl acetate (VA) monomers in a VP/VA weight ratio of about 90:10 to about 10:90. The VP and VA monomers can be present in a physical mixture of separate homopolymers, *i.e.*, polyvinylpyrrolidone (PVP) and polyvinyl acetate (PVA) respectively, or they can be present together in a PVP/VA copolymer.

Spec. ¶ 8. Furthermore, the Specification discloses:

Optional additional polymers in the composition, as a component of or separate from the polymeric matrix wherein the oral care substance is dispersed, can affect such properties of the composition as dissolution rate, adhesiveness to the dental surface, flexibility, mechanical strength, compatibility with the oral care substance, *etc.*, and can include without limitation PVP, polyethylene oxide, methylcellulose, ethylcellulose, carbomers (carboxyvinyl polymers), polyacrylates *etc.* The term “polyacrylate” herein encompasses polymers and copolymers having monomeric units selected from acrylic acid, esters and amides and methacrylic acid, esters and amides.

Spec. ¶ 43. From these disclosures of exemplary embodiments, we construe the claim term “polymeric matrix” to constitute a physical mixture of polymers of varying concentrations with, optionally, a mixture of other components, including polymers, which influence the properties of the composition.

Perna teaches an oral whitening composition comprising: “a dissolvable substrate **102** and a whitening material **104**. The dissolvable substrate **102** may be in the form of a dissolvable matrix such as a gelatinous or protein material.” Perna ¶ 20. Perna further teaches that: “[i]n another example, the dissolvable substrate **102** is composed of a cellulose and acrylic polymer.” *Id.* ¶ 27.

Furthermore, Perna teaches:

Thickeners may be used in the dissolvable substrate **102** to reduce the dissolution rate and increase contact time of the whitening material **104**. Suitable thickeners include neutralized carboxypolyethylene and other polyacrylic acid polymers and copolymers, hydroxypropylcellulose and other cellulose ethers, salts of poly(methyl vinyl ether-co-maleic anhydride), poly(vinylpyrrolidone), poly(vinylpyrrolidone-co-vinyl acetate), silicon dioxide, fumed silica, stearic acid esters, and others.

Id. ¶ 41. Appellants' elected species requires: "the matrix having vinylpyrrolidone as the monomer of the polymerized hydrophilic component" and "vinyl acetate as the monomer of the polymerized hydrophobic component."

Perna teaches poly(vinylpyrrolidone-co-vinyl acetate), which is a polymer in which vinylpyrrolidone and vinyl acetate are monomers, as a thickening agent. *Id.* Appellants' Specification explicitly teaches that "[t]he VP [vinylpyrrolidone] and VA [vinyl acetate] monomers can be present in a physical mixture of separate homopolymers, *i.e.*, polyvinylpyrrolidone (PVP) and polyvinyl acetate (PVA) respectively, or they can be present together in a PVP/VA copolymer," *i.e.*, as poly(vinylpyrrolidone-co-vinyl acetate). Spec. ¶ 8.

Appellants argue that the thickening agents taught by Perna cannot be considered as parts of the polymeric matrix, however, Appellants' Specification explicitly discloses that "[o]ptional additional polymers in the composition, as a component of or separate from the polymeric matrix ... can affect such properties of the composition as dissolution rate, adhesiveness to the dental surface, flexibility, mechanical strength, compatibility with the oral care substance, *etc.*" Spec. ¶ 43. We find a person of ordinary skill in the art would understand that thickening agents are thus contemplated by Appellants' Specification as potentially forming a part of the polymeric matrix. Consequently, we agree with the Examiner that Perna teaches the limitations in dispute.

Furthermore, having found that a thickener can be part of the claimed polymeric matrix, we further agree with the Examiner that Perna's teaching: "[a] suitable concentration of thickener depends upon thickener type, but

generally has a range up to about 20.0 percent by weight of the composition” (Perna ¶ 41), would suggest to a person of ordinary skill in the art that the 20% of thickener, combined with other elements of the polymeric matrix taught by Perna (e.g., cellulose or acrylic polymer, *see* Perna ¶ 27), would teach or suggest that the polymeric matrix could “constitute[] 25% to about 90% by weight of the composition” as required by Appellants’ elected species. We consequently agree with the Examiner that Perna teaches or suggests the limitations of Appellants’ elected species.

Issue 2

Appellants next argue the Examiner erred by failing to provide a reason why one skilled in the art would specifically choose to add poly(vinylpyrrolidone-co-vinyl acetate) as a thickener, polyethylene glycol as a humectant, and sodium percarbonate as the whitening material from the alleged “laundry list” of many optional ingredients taught by Perna. App. Br. 6–7.

Analysis

Appellants dispute the Examiner’s finding that “[t]he poly(vinylpyrrolidone-co-vinyl acetate) is disclosed in a short list of suitable thickeners and is specifically named.” App. Br. 7 (quoting Adv. Act. 2, (mailed February 24, 2014)). According to Appellants, the Examiner’s finding, without more, does not provide the proper motivation or reasoning why one skilled in the art would select poly(vinylpyrrolidone-co-vinyl acetate) from Perna’s teachings of suitable thickeners sufficient to support an obviousness analysis. *Id.*

Nor, argue Appellants, has the Examiner found proper motivation or reasoning as to why one skilled in the art would select sodium percarbonate from Perna's open ended list of suitable whitening materials. App. Br. 7.

The Examiner responds that Perna teaches the use of poly-(vinylpyrrolidone-co-vinyl acetate) as a thickener, and polyethylene glycol as a humectant. Ans. 11. The Examiner therefore finds that using these two components together is within the scope of the reference. *Id.* The Examiner also finds that the list of thickeners is relatively short and that a person of ordinary skill would therefore be motivated to choose poly-(vinylpyrrolidone-co-vinyl acetate) as a thickener from that list. *Id.*

The Examiner also finds Perna teaches polyethylene glycol in a short list of carriers and that polyethylene glycol is the only humectant taught. Ans. 11. The Examiner therefore finds that a person of ordinary skill would be motivated to use polyethylene glycol as a humectant in the films of Perna. *Id.*

Finally, the Examiner finds Perna explicitly teaches sodium percarbonate as a whitener in combination with the other elements of the composition.

We are not persuaded by Appellants' arguments. Perna teaches "[a] teeth whitening system [that] comprises a dissolvable matrix that supports a whitening material." Perna Abstr. When this finding is combined with our findings in the prior section, we agree with the Examiner that Perna teaches or suggests all of the limitations of Appellants' claim 1. We disagree with Appellants that the lists of potential components is overly lengthy; the passages we have quoted *supra* are relatively concise. Moreover, because we agree with the Examiner that Perna teaches or suggests all of the

limitations of claim 1, we further find that combining those elements taught in a single reference, to achieve a predictable result taught by the art, would be well within the skill and creativity of an ordinary artisan. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). We consequently affirm the Examiner's rejection of the claims on this ground.

B. The rejection of Claims 1–12, 14, 15, 18, 19, and 24–27 over Perna and Majeti

Issue 1

Appellants argue that the Examiner erred in finding their elected species obvious over the combination of Perna and Majeti. App. Br. 8.

Analysis

Appellants first argue that the teachings of Majeti fail to cure the alleged deficiencies of Perna. App. Br. 8. Appellants next argue Majeti would also lead one skilled in the art away from using a thickener such as poly-(vinylpyrrolidone-co-vinyl acetate), as selected by the Examiner, because Majeti teaches that its “[p]referred thickening agents are carboxyvinyl polymers, carrageenan, hydroxyethyl cellulose, laponite and water soluble salts of cellulose ethers such as sodium carboxymethylcellulose and sodium carboxymethyl hydroxyethyl cellulose.” *Id.* (quoting Majeti ¶ 92).

Appellants argue further that Majeti would also lead one skilled in the art away from Appellants' claimed “25% to about 90%” weight limitation because Majeti teaches that the vinyl pyrrolidone/vinyl acetate copolymer “is incorporated in the present compositions at about 0.1 % to about 20% by

weight and preferably from about 0.5% to about 10% by weight.” App. Br. 9 (quoting Majeti ¶ 36). In other words, Appellants contend, Majeti would lead one skilled in the art to use vinyl pyrrolidone/vinyl acetate copolymer in an amount less than Appellants’ “25% to about 90%” weight limitation. *Id.* “As such, the Examiner’s selection could have only been made with the use of impermissible hindsight gleaned from Appellants’ Specification and claims.” *Id.* (citing *Manual of Patent Examining Procedure* (MPEP) § 2142).

We disagree. First, we have already related our reasoning by which we agree with the Examiner’s findings and conclusions that the elected species would have been obvious over Perna.

Second, we are not persuaded that Majeti teaches away from the teachings of Perna or Appellants’ claimed invention. A teaching away requires a reference to actually criticize, discredit, or otherwise discourage the claimed solution. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) (“The prior art’s mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed.”). Appellants point to no such criticism or discrediting by Majeti of the teachings of Perna, but merely argue that Perna teaches a different preferred embodiment. That is insufficient evidence to arise to the level of a “teaching away” by Majeti.

Moreover, we are not persuaded by Appellants’ argument that the references suggest the vinyl pyrrolidone/vinyl acetate copolymer in an amount less than Appellants’ “25% to about 90%” weight limitation. *See* App. Br. 9. Rather, claim 1 requires that “the *polymeric matrix* constitutes

25% to about 90% by weight of the composition.” *Supra* at 2–3 (emphasis added). As we have previously explained, Appellants’ polymeric matrix can contain more than the vinyl pyrrolidone/vinyl acetate copolymer, it can also contain “additional polymers in the composition, as a component of or separate from the polymeric matrix wherein the oral care substance is dispersed, [which] can affect such properties of the composition as dissolution rate, adhesiveness to the dental surface, flexibility, mechanical strength, [or] compatibility with the oral care substance.” Spec. ¶ 43. Consequently we are not persuaded by Appellants’ argument that a person of ordinary skill would be directed away from the combined teachings of Perna and Majeti in this respect.

Issue 2

Appellants next argue that the Examiner erred in combining Perna and Majeti because they are directed to two completely different inventions. App. Br. 10.

Analysis

According to Appellants, Perna teaches a teeth whitening system/apparatus having a dissolvable matrix which is pressed against the tooth for a period of time until the matrix dissolves. App. Br. 10 (citing Perna ¶¶ 10–11, 20–22). Appellants contend Perna specifically distinguishes its oral composition from toothpastes and gels as prior art tooth bleaching systems. *Id.* (citing Perna ¶ 4).

Appellants contend Majeti’s oral composition is in the form of dentrifice, slurry, mouthrinse, gum, oral gel, mouthspray, etc., all of which,

Appellants assert, operate completely differently because they are not kept pressed onto the tooth for an extended period of time. App. Br. 10 (citing Majeti ¶¶ 42–55; 115). Appellants contend that if Perna were to be modified by Majeti, the combination would change the way Perna operates. *Id.* As such, Appellants argue, a person of ordinary skill in the art would not combine Majeti and Perna, because Majeti would change Perna’s principle of operation. *Id.*

We are not persuaded. Appellants make two assertions: (1) that Perna and Majeti cannot be combined because they are non-analogous art (i.e., because they are “completely different inventions”); and (2) that attempting to combine Perna’s and Majeti’s oral teeth-whitening compositions would change the principle of operation of Perna. *Id.*

With respect to the first assertion, references are analogous art if they are (1) from the same field of endeavor, regardless of the problem addressed or; (2) if the reference still is reasonably pertinent to the particular problem with which the inventor is involved. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). Perna is directed to: “A teeth whitening system compris[ing] a dissolvable matrix that supports a whitening material.” Perna Abstr. Majeti is directed to: “oral care compositions and methods for overall cleaning, whitening and preventing, reducing or removing surface deposited stains on natural teeth and dental prosthesis.” Majeti Abstr. Although Perna and Majeti may be patently distinct in the compositions and methods they respectively teach, it is undeniable that they are both directed to the same field of endeavor, *viz.*, the whitening of teeth by the application of oral compositions. Consequently, we find they are analogous art and the Examiner did not err in finding that a person of ordinary skill in the art of

oral compositions for teeth whitening would have knowledge of the references. *See In re Chevalier*, 500 Fed. Appx. 932, 934–35 (Fed. Cir. 2013) (non-precedential) (stating that the obviousness inquiry requires a determination that the combination of known elements would have been obvious to a person with ordinary skill in the art).

With respect to Appellants’ second assertion, the Examiner relies upon Majeti as teaching “[a] suitable copolymer for use in the present invention is a vinyl pyrrolidone/vinyl acetate copolymer (PVP/VA) having 60/40 weight ratio of PVP/VA and an average molecular weight ranging from about 1,000 to about 1,000,000.” Final Act. 6. In the instant appeal, the obviousness analysis does not require that the exact mechanisms of Perna and Majeti be combined. *See Ex parte Kahn*, No. 2000-1130, slip op. at 7 (BPAI Feb. 24, 2003) (noting that the features of a secondary reference need not be capable of incorporation into the structure of a primary reference). Rather the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981). We agree with the Examiner that both references teach the use of a vinyl pyrrolidone/vinyl acetate copolymer in an oral teeth-whitening composition and that it would have been obvious to select a known material based on its suitability for its intended use. *See* Final Act. 7 (citing MPEP § 2144.07).

Finally, we are not persuaded by Appellants’ allegation that the Examiner improperly relied upon hindsight analysis in reaching the conclusion that the claims would have been obvious. Appellants adduce no credible evidence that the Examiner relied upon knowledge that would have been outside of the scope of the knowledge of a person of ordinary skill in

the art or which could have been gleaned only from Appellants' Specification. *See In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971). We consequently affirm the Examiner's rejection of the claims on this ground.

C. Claims 1–10, 12, 14, 15, 18, 19, 24, 25, and 27 over Majeti and Krumme
Issue

Appellants argue the combination of Majeti and Krumme fails to teach or suggest all of the limitations of Appellants' elected species. App. Br. 11–12.

Analysis

Appellants argue Krumme neither teaches nor suggests the limitations of claim 1 reciting: (1) “the polymeric matrix having vinylpyrrolidone as the monomer of the polymerized hydrophilic component and vinyl acetate as the monomer of the polymerized hydrophobic component”; and (2) “wherein the oral care substance is a whitening agent that is sodium percarbonate and is present in a total hydrogen peroxide equivalent amount of about 0.1 % to about 50% by weight.” App. Br. 11–12 (emphasis omitted).

According to Appellants, Krumme teaches the use of only hydrophilic film-forming polymers to form its film and is silent with respect to the claim term “hydrophobic.” App. Br. 12 (citing, *inter alia*, Krumme Abstr.; col. 1, ll. 13–15; col. 2, ll. 46–51; col. 4, ll. 47–55; claim 1, claim 17).

Appellants argue further that the Examiner has failed to provide any reason or motivation why a person of ordinary skill in the art would select polyvinyl acetate and polyvinyl pyrrolidone from Krumme's allegedly open

ended list of hydrophilic film-forming polymers. App. Br. 12. Appellants point out that Krumme teaches that polyvinyl alcohol is “particularly preferred.” *Id.* at 12–13 (quoting Krumme col. 4, ll. 50–60). Appellants allege that the Examiner’s selection could only have been made as a result of impermissible hindsight analysis. *Id.* at 13.

Appellants also argue that Krumme teaches the use of “copolymers of the polymers mentioned.” App. Br. 13 (quoting Krumme col. 4, ll. 47–51). According to Appellants, a copolymer of polymers is not the same as polymers of two different monomeric units. *Id.* Appellants assert that copolymers of polymers means that the repeating units are polymeric units, whereas Appellants’ elected species claim a polymeric matrix in which the repeating monomeric units are vinyl acetate (which is hydrophobic) and vinylpyrrolidone (which is hydrophilic). *Id.* Appellants thus distinguish their polymeric matrix from Krumme, which teaches that (a) all of the polymeric units in his film are hydrophilic; and (b) the entire film itself is also completely hydrophilic. *Id.* Appellants also argue that Krumme neither teaches nor suggests the use of a whitening agent in its composition. *Id.*

Appellants argue that Majeti fails to cure the alleged deficiencies of Krumme. App. Br. 13. According to Appellants, Majeti fails to teach or suggest a polymeric matrix having vinylpyrrolidone as the monomer of the polymerized hydrophilic component and vinyl acetate as the monomer of the polymerized hydrophobic component. *Id.* Rather, argue Appellants, Majeti’s oral composition is in the form of dentrifice, slurry, mouthrinse, gum, oral gel, mouthspray, etc. *Id.* at 14 (citing Majeti ¶¶ 42–55; 115). Therefore, Appellants assert, Majeti teaches away from both the polymeric matrix and the film composition elements of Appellants’ elected species and

the Examiner's findings can only be the result of impermissible hindsight.
Id.

Appellants argue further that Majeti also fails to provide the requisite motivation or reasoning for a person of ordinary skill in the art to specifically select sodium percarbonate as the whitening agent, and that Majeti's teaching the use of a vinyl pyrrolidone/vinyl acetate copolymer, which has both a monomeric hydrophilic and monomeric hydrophobic component, would change Krumme's principle of operation. App. Br. 14.

The Examiner responds that Krumme teaches a film that may comprise polymers, including polyvinyl pyrrolidone, polyvinyl acetate, or copolymers thereof, which would include poly-(vinylpyrrolidone-co-vinyl acetate). Ans. 17. The Examiner finds Krumme also discloses that the films are used to deliver active ingredients to the teeth. *Id.* The Examiner concludes it would therefore have been obvious to an ordinary artisan to incorporate a whitening agent (i.e., an active agent) into the films of Krumme. *Id.*

The Examiner further finds Krumme teaches using the polymers recited in Appellants' elected species. Ans. 18. The Examiner finds Krumme also teaches copolymers of these polymers may be used. *Id.* The Examiner therefore finds a person of ordinary skill in the art would realize Krumme teaches that poly-(vinylpyrrolidone co-vinyl acetate) may be used as a polymer in the disclosed compositions. *Id.*

The Examiner finds Majeti discloses the elected copolymer and teaches that its compositions may be formulated into films. Ans. 20. The Examiner concludes it would have therefore been obvious to an ordinary artisan to have combined the copolymer, poly-(vinylpyrrolidone-co-vinyl

acetate), of Majeti into the films of Krumme. *Id.* Furthermore, the Examiner concludes that, because Krumme teaches its composition is a suitable vehicle for the delivery of dental active ingredients, it would have been obvious to an ordinary artisan to use sodium percarbonate as a whitener in the compositions of Krumme. *Id.*

We are not persuaded by Appellants' arguments. As an initial matter, we disagree with Appellants' contention that a copolymer as taught by Krumme is outside the scope of Appellants' claimed polymeric matrix. A copolymer is composed of two or more different monomers, hence poly-(vinylpyrrolidone-co-vinyl acetate) is a copolymer of vinylpyrrolidone and vinyl acetate. Appellants' Specification, in describing various embodiments of such a matrix, discloses "[t]he VP [vinylpyrrolidone] and VA [vinyl acetate] monomers can be present in a physical mixture of separate homopolymers, *i.e.*, polyvinylpyrrolidone (PVP) and polyvinyl acetate (PVA) respectively, or they can be present together in a PVP/VA copolymer." Spec. ¶ 8. There is no support, in either the claims or the Specification, for Appellants' contention that the polymeric matrix is necessarily formed only of homopolymeric chains of polyvinylpyrrolidone and polyvinyl acetate.

Krumme is directed to multi-layer preparations, in film form, consisting of hydrophilic polymers, for the rapid release of active ingredients. Krumme Abstr. Krumme teaches:

The polymer layers of the preparation in film form according to the invention are suitable as matrix for taking up and subsequently releasing constituents of a wide variety of types. The substances preferably used in this connection are selected from the group which comprises pharmacological active

ingredients, substances with refreshing effect, flavorings, odorizers and sweeteners.

Krumme 7 (emphasis added). Furthermore, Krumme teaches that: “Hydrophilic film-forming polymers suitable for producing the multilayer compositions in the form of films according to the invention are, in particular, those with high solubility in water, in particular various cellulose ethers, polyvinyl alcohols, polyvinyl acetate, polyvinylpyrrolidone, also copolymers of the polymers mentioned.” Krumme 8. Krumme explicitly thus teaches formation of a polymer matrix comprising polyvinylpyrrolidone and polyvinyl acetate or a copolymer of the two, capable of carrying an active ingredient.

Majeti teaches polymers that comprise, as preferred elements, monomers of vinyl acetate or vinylpyrrolidone, and that “[p]articularly preferred polymers include copolymers of vinyl pyrrolidone with one or a mixture of vinyl acetate, vinyl propionate, or vinyl butyrate.” Majeti ¶ 32. Majeti also teaches:

The present compositions preferably further comprise a teeth whitening agent, such as a bleach, a peroxide in particular. The present copolymers have been found to form complexes with inorganic compounds especially with hydrogen peroxide. Thus, the present copolymers provide a stabilizing benefit to the peroxide component when present in the compositions herein.

Majeti ¶ 40. Majeti further teaches: “*A preferred percarbonate is sodium percarbonate.* Other suitable whitening agents include potassium, ammonium, sodium and lithium persulfates and perborate mono- and tetrahydrates, and sodium pyrophosphate peroxyhydrate.” Majeti ¶ 90

(emphasis added). Majeti thus explicitly teaches, as a preferred whitening agent, the very agent recited in Appellants' elected species.

We consequently agree with the Examiner that it would have been obvious to a person of ordinary skill to combine the teachings of Krumme and Majeti to reach a polymeric matrix, composed of polyvinylpyrrolidone and polyvinyl acetate with a whitening agent dispersed in the matrix, comprising sodium percarbonate. Furthermore, we are persuaded an ordinary artisan would have been motivated to combine the references to add a whitening agent to the polymeric matrix of Krumme to achieve the timed release of the agent in solution when applied to the teeth.

We are not persuaded by Appellants' contention that the combination of the references would change the principle of operation of Krumme. Again, features of a secondary reference need not be capable of incorporation into the structure of a primary reference. *See Kahn*, No. 2000-1130, slip op. at 7. Rather the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. *Keller*, 642 F.2d at 425. We agree with the Examiner that a person of ordinary skill in the art would have combined the teachings of Krumme and Majeti to add the whitening agent of Majeti to the polymeric matrix active agent delivery system of Krumme.

Finally, we are not persuaded by Appellants' allegation that the Examiner improperly relied upon hindsight analysis in reaching the conclusion that the elected species would have been obvious. *See App. Br.* 13–14. Appellants adduce no credible evidence that the Examiner relied upon knowledge that would have been outside of the scope of the knowledge

Appeal 2015-002319
Application 10/870,848

of a person of ordinary skill in the art or which could have been gleaned only from Appellants' Specification. *See McLaughlin*, 443 F.2d at 1395.

DECISION

The Examiner's rejections of claims 1–12, 14, 15, 18, 19, and 24–27 as unpatentable under 35 U.S.C. § 103(a) are affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED