



# 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.
14/770,901	08/27/2015	Shashank Potnis	9491-00-US-01-OC	8904
23909	7590	03/09/2020	EXAMINER	
COLGATE-PALMOLIVE COMPANY			LAZARO, DOMINIC	
909 RIVER ROAD			ART UNIT	PAPER NUMBER
PISCATAWAY, NJ 08855			1611	
			NOTIFICATION DATE	DELIVERY MODE
			03/09/2020	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* SHASHANK POTNIS,  
RAVI SUBRAMANYAM, and NAVIN LEWIS

---

Appeal 2018-007566  
Application 14/770,901  
Technology Center 1600

---

Before RICHARD M. LEOVITZ, JEFFREY N. FREDMAN, and  
MICHAEL A. VALEK, *Administrative Patent Judges*.

FREDMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal<sup>1</sup> under 35 U.S.C. § 134(a) involving claims directed to a toothpaste product. The Examiner rejected the claims as obvious. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

*Statement of the Case*

*Background*

“Soluble zinc salts, such as zinc citrate, have been used in dentifrice compositions . . . but may react with common excipients in dentifrice to

---

<sup>1</sup> We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the Real Party in Interest as Colgate-Palmolive Company (*see* Appeal Br. 2).

form insoluble salts and so reduce delivery of the zinc to the tooth surface” (Spec. ¶ 1). “The invention provides, in one embodiment, formulations to enhance the delivery of  $Zn^{++}$  ions from a zinc ion source, e.g., zinc oxide and/or zinc citrate, onto hard tissue surfaces e.g., hydroxyapatite (HAP), from a calcium carbonate dentifrice, to obtain enhanced antibacterial efficacy” (*id.* ¶ 6).

*The Claims*

Claims 1–3, 5–12, 17, and 18 are on appeal.<sup>2</sup> Claim 1 is representative and reads as follows:

1. A toothpaste product comprising  
a first dentifrice comprising a calcium carbonate abrasive,  
a second dentifrice comprising a zinc ion source in a gel base, and  
a container which holds the first dentifrice physically separate from the second dentifrice until the dentifrices are dispensed,  
wherein the amount of first dentifrice relative to the second dentifrice is from 3:1 to 5:1.

*The issues*

A. The Examiner rejected claims 1–3, 5, 6, 8, 10–12, 17, and 18<sup>3</sup> under 35 U.S.C. § 103(a) as obvious over Williams<sup>4</sup> and Kiozpeoplou<sup>5</sup> (Final Act. 3–15).

---

<sup>2</sup> The Examiner notes that claims 13 and 14 are withdrawn from consideration (*see* Advisory Act. 1).

<sup>3</sup> The Examiner allowed entry of claims 17 and 18 in the Advisory Action mailed 8/27/2015 and further addressed these claims in the Examiner’s Answer (*see, e.g.*, Ans. 16).

<sup>4</sup> Williams et al., US 5,616,313, issued Apr. 1, 1997.

B. The Examiner rejected claims 3, 6, and 7 under 35 U.S.C. § 103(a) as obvious over Williams, Kiozpeoplou, and Winston<sup>6</sup> (Final Act. 19–21).

C. The Examiner rejected claim 9 under 35 U.S.C. § 103(a) as obvious over Williams, Kiozpeoplou, and Ramsay<sup>7</sup> (Final Act. 22–23).

A. *35 U.S.C. § 103(a) over Williams and Kiozpeoplou*

The Examiner finds that Williams teaches a dual dentrifice with zinc in a first dentrifice and calcium carbonate in the second dentrifice that are kept in separate chambers of a dual compartment dispenser (*see* Final Act. 4). The Examiner also finds that Williams teaches the use of a gel form (*see id.* at 5). The Examiner acknowledges that Williams teaches a 1:1 ratio of the first and second dentrifices and does not teach “wherein the amount of first dentifrice relative to the second dentifrice is from 3:1 to 5:1” as recited by claim 1 (*see id.* at 5).

The Examiner finds that Kiozpeoplou teaches an effervescing dual dentrifice with a bicarbonate first portion and acidic second portion and teaches a range of the “weight ratio of the first portion to the second portion of about 0.5:1 to 40:1” (Final Act. 9).

The Examiner finds it obvious to use Kiozpeoplou’s ranges for the two portions of the dual dentrifice because the ranges overlap with those claimed and because the ranges would be optimized for desired amounts of effervescence (*see* Final Act. 10–11).

---

<sup>5</sup> Kiozpeoplou, US 4,487,757, issued Dec. 11, 1984.

<sup>6</sup> Winston et al., WO 94/26245 A1, published Nov. 24, 1994.

<sup>7</sup> Ramsay, US 6,036,933, issued Mar. 14, 2000.

The issue with respect to this rejection is: Does a preponderance of the evidence of record support the Examiner’s finding that Williams and Kiozpeoplou render the claims obvious?

*Findings of Fact*

1. Williams teaches a “combination of zinc and bicarbonate salts deliver a very potent inhibitory effect against gingival and periodontal tissue damage. It has been further established that such effect requires the zinc and bicarbonate salts to be separately packaged prior to their introduction into the oral cavity” (Williams 3:17–22).

2. Williams teaches the “first composition, i.e. the composition with zinc salt, preferably is a gel” (Williams 3:54–55).

3. Williams teaches the “bicarbonate second composition may also contain” “an abrasive in addition to the bicarbonate. Abrasives may be selected from . . . calcium carbonate” (Williams 4:58; 5:16–20).

4. Table I of Williams is reproduced below:

TABLE I

COMPONENTS	FIRST PASTE	SECOND PASTE
Glycerol	26.0	33.0
Sorbitol (70% Aqueous)	27.9	—
Sodium Carboxymethyl Cellulose	—	0.8
Xanthan Gum	0.5	—
Silica Thickener	3.0	0.5
Sodium Benzoate	0.1	0.5
Sodium Saccharin	—	0.2
Zinc Lactate	2.0	—
Calcium Metaphosphate	30.0	17.5
Calcium Carbonate	—	2.5
Sodium Bicarbonate	—	20.0
Citric Acid	4.5	—
Flavor	—	1.0
Sodium Fluoride	0.24	0.24
Water	balance	balance

Table I of Williams “illustrates a dual-paste dentifrice” that comprises a first paste with zinc and a second paste with calcium carbonate (*see Williams 6:63 to 7:18*).

5. Williams teaches that in Example 3, “[e]qual amounts of the first and second pastes are added to respective chambers of a dual compartment dispenser . . . the consumer applies pressure to the dispenser thereby causing extrusion of strands of the first and second pastes which are deposited onto a toothbrush” (*Williams 7:19–26*).

6. Williams teaches that after the composition in Example 2, with both an acid and sodium bicarbonate, are “dispensed from the package [they] combine to form an effervescent mouthwash” (*Williams 6:57–59*).

7. Williams teaches “[r]elative weight amounts of the first composition to that of the second composition will range from about 1:2 to 2:1, preferably about 1:1. Each component may be kept isolated in a separate compartment of a dispenser” (*Williams 5:41–44*).

8. Kiozpeoplou teaches

a container of dentifrice, in one part of which sodium bicarbonate has been successfully stabilized due to the presence of a suitable water insoluble dental abrasive, and in a second part of which there is contained an ingredient to induce a reaction with the previously stabilized bicarbonate and thereby provide the user with an effervescent sensation and the desirable cleaning effects of the in situ generated carbon dioxide gas.

(*Kiozpeoplou 3:13–21*).

9. Kiozpeoplou teaches the “first portion of the toothpaste preferably usually contains at least about 15%, and preferably about 15 to 50% of sodium bicarbonate” (*Kiozpeoplou 5:18–20*).

10. Kiozpeoplou teaches “[i]t is preferred for the supplementing polishing agent to be calcium carbonate” (Kiozpeoplou 5:38–39).

11. Kiozpeoplou teaches the “second portion of the toothpaste of the invention, which is maintained physically separate from the first portion prior to extrusion from the toothpaste container, comprises . . . about 1 to 20% by weight of said second portion of an acidic compound . . . which is reactive . . . to cause the bicarbonate to effervesce” (Kiozpeoplou 10:11–22).

12. Kiozpeoplou teaches “[a]cidic compounds which can be present in the second portion are malic acid, alginic acid; citric acid” (Kiozpeoplou 11:1–2).

13. Kiozpeoplou teaches the “portions of the toothpaste present in the dispensing container are in a weight ratio of the first portion to the second portion of about 0.5:1 to 40:1, preferably about 0.7:1 to 20:1, more preferably about 0.8:1 to 5:1 and most preferably (usually) about 1:1” (Kiozpeoplou 5:1–5).

#### *Principles of Law*

A prima facie case for obviousness “requires a suggestion of all limitations in a claim,” *CFMT, Inc. v. Yieldup Int’l Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003) and “a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

#### *Analysis*

We adopt the Examiner’s findings of fact and reasoning regarding the scope and content of the prior art (Final Act. 3–15; FF 1–13) and agree that a preponderance of the evidence supports the Examiner’s determination the

claims are rendered obvious by Williams and Kiozpeoplou. We address Appellant's arguments below.

Appellant contends the "range disclosed in Williams (from about 1:2 to 2:1) does not overlap or is not even close to the claimed range (from 3:1 to 5:1) of the amount of first dentifrice comprising a calcium carbonate abrasive relative to the second dentifrice comprising a zinc ion source recited in claims 1 and 12" (Appeal Br. 5). Appellant contends "Kiozpeoplou does not disclose or teach any range of the ratio of the first dentifrice comprising **calcium carbonate** to the second dentifrice comprising a **zinc ion source**" (*id.* 5–6). Appellant contends

Kiozpeoplou's acidic second portion is different from Williams' "First" component. Since citric acid is not an essential component of Williams' composition and Williams does not discuss anything regarding effervescence, one of skill in the art would not be motivated to modify Williams' dual-paste toothpaste comprising zinc salts and calcium carbonate in order to optimize effervescence for "mouthfeel effect".

(*id.* 7).

We are not persuaded. As the Examiner pointed out, "effervescence is clearly a result-effective variable" mentioned as desirable by both Williams and Kiozpeoplou (FF 6, 8, 11; Ans. 6). Indeed, even Williams' toothpaste of Table 1 shows a first paste with citric acid and a second paste with sodium bicarbonate (FF 4), reasonably suggesting a desire for effervescence because Kiozpeoplou evidences that the ordinary artisan knew the combination of these components results in effervescence (FF 8).

The ordinary artisan, motivated by Kiozpeoplou to generate an effervescent toothpaste composition (FF 8, 11) using a variety of ratios of first bicarbonate and second acidic pastes (FF 13) would have reasonably

incorporated zinc into the second paste of Kiozpeoplou because Williams teaches a “combination of zinc and bicarbonate salts deliver a very potent inhibitory effect against gingival and periodontal tissue damage. It has been further established that such effect requires the zinc and bicarbonate salts to be separately packaged prior to their introduction into the oral cavity” (FF 1).<sup>8</sup>

Thus, the ordinary artisan would have had reason to combine the disclosures of Kiozpeoplou and Williams in order to form a two part dental composition that not only treated gingivitis and periodontal disease (FF 1) but also resulted in effervescence with the “desirable cleaning effects of the in situ generated carbon dioxide gas” (FF 8).

We are unpersuaded by Appellant’s argument that “citric acid is not an essential component of Williams’ composition” and therefore one would not be motivated to combine William’s teachings regarding a zinc portion with those in Kiozpeoplou’s regarding acidic pastes (*see* Appeal Br. 7) because the claims use the open, comprising, format and do not exclude the use of both citric acid and zinc. *See Georgia-Pacific Corp. v. U.S. Gypsum Co.*, 195 F.3d 1322, 1327 (Fed. Cir. 1999) (The transitional term “comprising” is “inclusive or open-ended and does not exclude additional, unrecited elements.”)

Moreover, Appellant’s argument addresses Williams and Kiozpeoplou individually rather than the combination of the prior art as a whole. “Non-

---

<sup>8</sup> We note that “where a rejection is predicated on two references each containing pertinent disclosure . . . we deem it to be of no significance, but merely a matter of exposition, that the rejection is stated to be on A in view of B instead of on B in view of A, or to term one reference primary and the other secondary.” *In re Bush*, 296 F.2d 491, 496 (CCPA 1961).

obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references . . . . [The reference] must be read, not in isolation, but for what it fairly teaches in combination with the prior art as a whole.” *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). When read together, Williams discusses effervescence in a mouthwash context (FF 6) and teaches the benefits of bicarbonate and calcium carbonate abrasive in one paste (FF 3) and zinc in another paste for periodontal disease (FF 1), while Kiozpeplou teaches the benefits of bicarbonate in one paste and an acid in the other for effervescence and cleaning effects (FF 8, 11). Thus, in combination, Williams and Kiozpeplou provide reasons to form a two part toothpaste composition with a first dentifrice having bicarbonate and a calcium carbonate abrasive in one paste (FF 1, 3, 8, 9) with zinc and an acid in a second paste (FF 1, 2, 11, 12).

Appellant contends “the claimed range (from 3:1 to 5:1) of the amount of first dentifrice comprising a calcium carbonate abrasive relative to the second dentifrice comprising a zinc ion source would still not be obvious” (Appeal Br. 7). Appellant contends:

The Examiner has not provided any articulated reason why one of skill in the art would be motivated to modify Williams’ toothpaste by changing the ratio of the first dentifrice comprising **calcium carbonate** to the second dentifrice comprising **a zinc ion source** to the claimed ratio (from 3:1 to 5:1), ignoring Williams’ teachings that “relative weight amounts of the first composition to that of the second composition will range from about 1:2 to 2:1, preferably about 1:1.”

(*id.* 8).

We find this argument unpersuasive because “discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art.” *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980). As Appellant acknowledges, Williams recognizes that the relative weight amounts of the first and second toothpaste compositions are variables that may be optimized (FF 7). Kiozpeoplou further supports the desire to optimize first and second toothpaste compositions in teaching a variety of different weight ratios, ranging from 0.5:1 to 40:1, though usually preferring 1:1 (FF 13). Thus, when the references are read together, the ordinary artisan would have recognized that the relative weight amounts of the first and second toothpaste compositions were optimizable variables. *See In re Aller*, 220 F.2d 454, 456 (CCPA 1955) (“[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.”).

The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims . . . in such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.

*In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990).

Appellants have not provided evidence that the claimed ratio is critical or achieves unexpected results

Appellant responds that Williams disclosed ranges “are not mere examples or preferred embodiments. Williams discloses no broader disclosure or nonpreferred embodiment falling within the scope of claims 1 and 12” (Appeal Br. 8).

We find this argument unpersuasive for two reasons. First, Williams does not teach away, discredit, or discourage the use of broader ranges, but rather simply teaches a preferred range (FF 7). Second, the rejection relies upon the combination of Williams with Kiozpeoplou, which expressly teaches ranges that overlap with those claimed, providing reasons to optimize within the ranges disclosed by the entirety of the prior art. “A *prima facie* case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art.” *In re Applied Materials*, 692 F.3d 1289, 1295 (Fed. Cir. 2012) (citing *In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003)). *Applied Materials* does not limit the analysis to the primary reference recited in the prior art, but address the situation where the “combination of the various dimensions from the different pieces of prior art was also obvious. The mere fact that multiple result-effective variables were combined does not necessarily render their combination beyond the capability of a person having ordinary skill in the art.” *Applied Materials*, 692 F.3d at 1298. The same situation applies here, where the use of the weight ranges of Kiozpeoplou for the first and second toothpastes with those of Williams would have been optimizable by the ordinary artisan at the time of filing (FF 7, 13).

Appellant contends the “only basis for beneficial effects of the claimed ratio (from 3:1 to 5:1) of the first dentifrice comprising **calcium carbonate** to the second dentifrice comprising a **zinc ion source** is found in Appellants' disclosure, the use of which is impermissible” (Appeal Br. 8).

We are not persuaded. While we are aware that hindsight bias may plague determinations of obviousness, *Graham v. John Deere Co.*, 383 U.S. 1, 36 (1966), we are also mindful that the Supreme Court has clearly stated

that the “combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR*, 550 U.S. at 416. Here, incorporation of zinc into one part of dual part dentrifices in order to inhibit periodontal tissue damage is disclosed by Williams (FF 1), while Kiozpeoplou teaches two part effervescent compositions produce desirable cleaning effects (FF 8). Thus, as already discussed above, the ordinary artisan would have had reason to use the zinc of Williams in the two part effervescence composition of Kiozpeoplou in order to obtain both the periodontal and cleaning benefits. Both Williams and Kiozpeoplou identify the weight ratios of the two parts as results-effective variables (FF 7, 13) and Kiozpeoplou teaches weight ratios overlapping the claimed range. Thus, the entire necessary disclosure to obtain two part dentrifices with zinc in one portion, a calcium carbonate abrasive in the other physically separate portion, and weight ratios overlapping the claimed range are present in the prior art teachings of Williams and Kiozpeoplou (FF 1–13).

*Conclusion of Law*

A preponderance of the evidence of record support the Examiner’s finding that Williams and Kiozpeoplou render the claims obvious

*B. 35 U.S.C. § 103(a) over Williams, Kiozpeoplou, and Winston*

Appellant contends:

There is no teaching or suggestion anywhere in Williams that zinc oxide would be incorporated into Williams’ first composition. Although Winston shows an advantage of zinc oxide particle over zinc citrate and zinc sulfite in Example 1, the experiment was performed using zinc oxide, zinc citrate and

zinc sulfate suspensions, but not using dual-paste dentifrices comprising a zinc salt and a bicarbonate salt.

(Appeal Br. 10).

We are not persuaded. Williams teaches the use of zinc to protect against periodontal damage (FF 1, 2). Winston teaches that zinc oxide is used in a large number of prior art oral care products (*see* Winston 3:21 to 7:22) and specifically teaches zinc oxide in dentifrices (*see* Winston 9:30–31) because “[o]ral care compositions containing zinc oxide exhibit enhanced anti-plaque properties” (*id.* at 10:8–9). Winston also teaches “the lingering unpleasant metallic and astringent taste of most zinc salts is absent” (*id.* at 10:26–27). Thus, we agree with the Examiner that the ordinary artisan would have found it obvious to select the zinc oxide of Winston for use in the dentifrice of Williams in order to avoid unpleasant tastes and obtain the periodontal protection and anti-plaque properties of zinc (FF 1; Winston 9:30–31; 10:26–27).

*C. 35 U.S.C. § 103(a) over Williams, Kiozpeoplou, and Ramsay*

Appellant does not separately argue this obviousness rejection, instead relying upon their arguments to overcome the combination of Williams and Kiozpeoplou. Having affirmed the obviousness of claim 1 for the reasons given above, we also find that the further combination with Ramsay renders the rejected claims obvious for the reasons given by the Examiner (*see* Final Act. 22–23).

DECISION

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)</b>	<b>Affirmed</b>	<b>Reversed</b>
1-3, 5, 6, 8, 10-12, 17, 18	103(a)	Williams, Kiozpeoplou	1-3, 5, 6, 8, 10-12, 17, 18	
3, 6, 7	103(a)	Williams, Kiozpeoplou, Winston	3, 6, 7	
9	103(a)	Williams, Kiozpeoplou, Ramsay	9	
<b>Overall Outcome</b>			1-3, 5-12, 17, 18	

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)(iv).

AFFIRMED