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.
14/540,754	11/13/2014	Darrell Holton JR.	N64138 1020US.D1 (0024.1)	8617

26158 7590 10/13/2020

WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

EXAMINER	
AHMED, HASAN SYED	

ART UNIT	PAPER NUMBER
1615	

NOTIFICATION DATE	DELIVERY MODE
10/13/2020	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):

BostonDocket@wbd-us.com
IPDocketing@wbd-us.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DARRELL HOLTON JR., NELLY FRANSÉN, and MATT REDDICK

Appeal 2020-001550
Application 14/540,754
Technology Center 1600

Before JEFFREY N. FREDMAN, DEBORAH KATZ, and JOHN G. NEW, *Administrative Patent Judges*.

FREDMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal[1,2] under 35 U.S.C. § 134(a) involving claims to a method for preparing nicotine-containing pharmaceutical composition. The Examiner rejected the claims as obvious. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

---

[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identified the Real Party in Interest as Niconovum USA, Inc., (*see* Appeal Br. 1) but has since updated the name of the applicant to Modoral Brands, Inc. (*see* Application Data Sheet submitted May 21, 2020).

[2] We have considered and herein refer to the Specification of Nov. 13, 2014 ("Spec."); Final Office Action of Dec. 31, 2018 ("Final Act."); Appeal Brief of July 1, 2019 ("Appeal Br."); Examiner's Answer of Oct. 22, 2019 ("Ans."); and Reply Brief of Dec. 23, 2019 ("Reply Br.").

Statement of the Case

Background

"[A]dministration of nicotine has been employed in an effort to help cigarette smokers quit smoking (i.e., as a smoking cessation aid). For example, nicotine has been an active ingredient of various types of so-called 'nicotine replacement therapy' or 'NRT' products" (Spec. 2). One "way that has been employed to provide oral administration of nicotine has been through the use of nicotine-containing lozenge or tablet types of products" (*id.* at 3). The Specification states that "[i]t would be desirable to provide alternative compositions capable of delivering or administering nicotine via an oral route for therapeutic purposes" (*id.* at 4).

The Claims

Claims 28–39 and 41–47 are on appeal.[3] Independent claim 28 is representative and reads as follows:

> 28. A method of preparing a nicotine-containing pharmaceutical composition, comprising:
>
> (i) mixing a non-hygroscopic sugar substitute capable of forming a glassy matrix in an amount of at least about 80% by weight and a sugar alcohol syrup in a melted state to form a mixture;
>
> (ii) cooling the mixture and incorporating a nicotinic compound into the cooled mixture; and
>
> (iii) further cooling the mixture to room temperature to form a solid nicotine containing pharmaceutical composition,

[3] Claims 1–27 and 40 are cancelled (Appeal Br. 13–15). Claims 48–52 are withdrawn (*id.* at 16–17).

> wherein the mixture does not comprise a gum component, and
>
> wherein the solid nicotine-containing pharmaceutical composition is translucent.

(Appeal Br. 13).

The Issues

A. The Examiner rejected claims 28–30, 33–39, 41–43, 46, and 47 as unpatentable under 35 U.S.C. § 103 as obvious over Liu[4] and Chan[5] (Final Act. 2–4).

B. The Examiner rejected claims 28–39 and 41–47 as unpatentable under 35 U.S.C. § 103 as obvious over Liu, Chan, and Hansson[6] (Final Act. 4–5).

35 U.S.C. 103 over Liu, Chan, and Hansson

Because the obviousness rejections all rely on Liu, we discuss the rejections together. The Examiner finds Liu teaches a method for preparing a nicotine-containing solid oral dosage form by: (1) mixing and heating a non-hygroscopic sugar alcohol and a sugar component to form a melt; (2) cooking the melt; (3) removing excess moisture; (4) cooling the melt; (5) incorporating a nicotine active; and (5) forming a solid (Final Act. 2–3). The Examiner finds that the process forms a transparent glassy matrix (*see id.* at 3). The Examiner concludes that it would have been obvious to a person of ordinary skill in the art to modify Liu to perform the claimed

[4] Liu et al., US 2004/0101543 A1, published May 27, 2004
[5] Chan et al., US 2005/0123502 A1, published June 9, 2005
[6] Hansson, US 2004/0191322 A1, published Sept. 30, 2004.

process to provide a dosage form that dissolves more rapidly than commercially available compressed nicotine tablets (*id.* at 3–4).

The issue with respect to this rejection is: Does the evidence of record support the Examiner's conclusion that the combination of Liu, Chan, and Hansson renders the claims obvious?

Findings of Fact ("FF")

1. Liu teaches a solid oral dosage form including a glassy matrix formed from at least one substantially non-hygroscopic sugar substitute and a nicotine active (Liu ¶¶ 19–21) and that "[l]ozenges are a preferred dosage form" (Liu ¶ 12).
2. Liu teaches:

> The product matrix is in a glassy, i.e., amorphous, physical state. . . . [I]t is believed that the glassy matrix structure stabilizes nicotine actives such as nicotine and its derivatives, and potentially other components that tend to be unstable to moisture, e.g., by reducing penetration of water into the oral dosage form. The glassy matrix structure also tends to be more [a]esthetically appealing to the user, e.g., providing a desirably smooth, organoleptic feel, which may increase user compliance. In addition, the glassy matrix structure tends to dissolve more rapidly than commercially available compressed nicotine tablets of which the present inventors are aware, thereby providing potentially faster craving relief than such tablets.

(Liu ¶ 23).

3. Liu teaches:

> The formation of a glassy state is also typically characterized by a transparent appearance. As will be appreciated by those skilled in the art, the physical state is influenced by the properties of the components (especially sugar alcohols and other sugar components), and the process of making the

> product, and those skilled in the art will be able to select appropriate components and processes.

(Liu ¶ 24).

4. Liu teaches the "[t]he substantially non-hygroscopic sugar alcohol serves as a carrier . . . for the nicotine actives and optional adjuvants. The solid, oral dosage form typically comprises at least about 40% of the sugar alcohol . . . most preferably at least about 85%, based on the weight of the dosage form" (Liu ¶ 28).

5. Liu teaches:

> One or more sugars or-other sugar alcohols may be used, e.g., as bulking agents. It has been found that such other sugar components may reduce the processing temperature required to form the oral dosage form, thereby tending to maintain stability of nicotine actives such as nicotine and its derivatives, and to increase the cost effectiveness of the process. Suitable other sugar components include sucrose, sorbitol, and xylitol, and in a preferred embodiment is sorbitol.

(Liu ¶ 37).

6. Liu teaches "the type and amount of optional other sugar components will preferably be selected such that the oral dosage form is substantially non-hygroscopic and glassy" (Liu ¶ 38).

7. Liu teaches "[t]ypically the oral dosage form will comprise from 0% to about 20%, e.g., from about 1 % to about 20% or from about 10% to about 20% of such other sugar components" (Liu ¶ 38).

8. Liu teaches a method of preparing a solid oral dosage form including the steps of:

> (1) with mixing and heating, forming a melt of the substantially non-hygroscopic sugar alcohol and optionally, other sugar components and/or a diluent such as water;

> (2) cooking the melt;
>
> (3) removing excess moisture from the melt (e.g., to less than about 2% moisture);
>
> (4) cooling the melt with mixing until the melt is a plastic-like, workable mass;
>
> (5) while the melt is a plastic-like mass, incorporating the nicotine active and any remaining optional ingredients; and
>
> (6) forming the plastic-like mixture into solid, oral dosage forms having the desired size and shape.

(Liu ¶¶ 54–60).

9. Liu teaches a method in which "the desired quantity of the substantially non-hygroscopic sugar alcohol and any other sugar components are dissolved in water by heating them in a kettle until dissolved. Additional sugar components may be added and cooking continued until a final temperature of about 145–165° C." (Liu ¶ 62).

10. Liu teaches a method in which "a film of a mixture of the sugar components is spread on a heat exchange surface and heated to about 165–170° C. . . . The composition is then rapidly cooled to about 100–120° C. and worked as a plastic-like mass, mixing in the nicotine active" (Liu ¶ 64).

11. Liu teaches "the cooking temperature should be sufficiently high to drive water from the mixture." Further, "to facilitate formation of a transparent product, [a] buffer is added as a solution" (Liu ¶ 65).

12. Chan teaches nicotine containing oral compositions that may include additional excipients, including sodium chloride, and sucralose (Chan ¶¶ 10, 24, 69).

13. Hansson teaches nicotine containing oral compositions including nicotine sorbed onto a porous particulate carrier, *viz.*, microcrystalline cellulose (Hansson ¶10).

Principles of Law

"The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

Analysis

We adopt the Examiner's findings of fact and reasoning regarding the scope and content of the prior art (Final Act. 2–5; FF 1–13) and agree that the claims are obvious over Liu, Chan, and Hansson. We address Appellant's arguments below.

Appellant contends that "Liu does not teach or suggest a method of preparing a nicotine-containing pharmaceutical composition, wherein the resulting solid nicotine-containing pharmaceutical composition is translucent" (Appeal Br. 4). Appellant contends that "[t]he inventors of the present invention have specifically recognized the importance of incorporating a syrup, *e.g.*, a sugar alcohol syrup, to provide the desired level of translucency/transparency in the resulting product" (*id.* at 4–5).

We do not find this argument persuasive because Liu expressly teaches a glassy matrix characterized by a transparent appearance (FF 3). Liu teaches the use of sugar alcohols and sugar alcohol syrups where melted sugar alcohol forms a syrup (FF 5, 8). Moreover, Liu expressly teaches that the transparent appearance is influenced by the properties of the sugar

alcohol and other sugar components, and the process of making the product (*id.*).

Appellant contends that "[t]he Examiner has pointed to nothing in Liu that discloses the recited step of mixing the non-hygroscopic sugar substitute with a sugar alcohol syrup" (Appeal. Br. 5). Appellant contends that the Specification defines "sugar alcohol syrup" as "a thick solution of sugar alcohol in water" (*id.*, citing Spec. 15:29–16:8). Appellant further contends that Liu does not teach mixing a sugar alcohol syrup with a non-hygroscopic sugar substitute in a melted state to form a mixture (*id.* at 6–7). Appellant contends that the claimed process requires previously preparing a sugar alcohol syrup by heating and cooling to form a viscous composition, then mixing with a non-hygroscopic sugar substitute (Reply Br. 4).

We are not persuaded by Appellant's arguments. Liu teaches forming a melt of a non-hygroscopic sugar substitute, a sugar alcohol (sugar component), and a diluent such as water (FF 8). Liu teaches that a person of ordinary skill in the art would have been able to form a transparent lozenge by selecting the appropriate components, e.g., sugar alcohol and water, and processes, e.g., combining sugar alcohol and water (FF 3). Accordingly, Liu teaches the general conditions for forming a sugar alcohol syrup, i.e., combining sugar alcohol and water (FF 8), and further suggests optimizing those conditions to form a transparent lozenge (FF 1, 11). "[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." *In re Aller*, 220 F.2d 454, 456 (CCPA 1955).

Appellant contends that Liu teaches away from forming a sugar alcohol syrup (Appeal Br. 6). Specifically, Appellant contends that Liu

teaches a process that requires adding a sugar alcohol, e.g., xylitol, as a powder and not a syrup (*id.*, citing Liu ¶ 85 (Example 4)). Appellant further contends that Liu's Example 4 teaches adding a sugar alcohol powder during the "cooling step" and not the "mixing step" (*see id.* at 6–7). Appellant contends that the order of addition in Liu's Example 4 would not have been expected to produce a translucent product (*id.* at 7).

We are not persuaded by Appellant's argument. "The prior art's mere disclosure of more than one alternative does not constitute a teaching away from . . . alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed." *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). Liu teaches several alternatives for mixing sugar alcohol with a sugar substitute. The alternatives include a sugar alcohol powder as cited by Appellant, and solutions of sugar alcohol and water (*see* FF 8–11). Liu does not criticize, discredit, or otherwise discourage combining a non-hygroscopic sugar substitute with a solution of sugar alcohol and water (*see id.*). Accordingly, we are not persuaded that Liu teaches away from mixing a sugar alcohol syrup with a non-hygroscopic sugar substitute.

Appellant argues that dependent claims 34 and 46 are independently patentable over cited art (Appeal Br. 8–10). As to claim 34—reciting an amount of sugar alcohol "sufficient to slow recrystallization of the sugar substitute in melted form"—Appellant contends that Liu does not teach the "use of sugar alcohol syrup <u>in any amount</u>, and further does not disclose or suggest any specific benefit associate with use of this component." (*Id.* at 8).

We are not persuaded by Appellant's argument. The Specification discloses that the amount of sugar alcohol syrup may be up to about 20% by

weight of the product mixture (Spec. 16; *see also* claim 37). The Specification explains that "[o]ne of skill in the art would understand the need to vary the amount of sugar alcohol syrup depending on the composition of the remaining ingredients to ensure that the recrystallization is sufficiently slow to provide a material with the desired characteristics (e.g., a desired level of translucency/transparency)" (*id.*).

Liu teaches the same amount of sugar alcohol, i.e., up to about 20%, for the same purpose, i.e., forming a transparent nicotine containing lozenge (*see* FF 1, 3, 5–7, 11). Because the Examiner has shown Liu teaches a substantially identical process for preparing a substantially identical product, the burden shifts to Appellant to show a difference between the prior art process and the claimed process. *See in re Best,* 562 F.2d 1252, 1254–1255 (CCPA 1977) ("[The] fairness [of the burden-shifting] is evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products"). Appellant has not submitted the kind of factual evidence required to rebut the Examiner's findings. *See In re Geisler,* 116 F.3d 1465, 1470 (Fed. Cir. 1997).

As to claim 46, Appellant contends that Liu does not teach "heating a melted mixture to a temperature above the hard crack stage of the sugar substitute" (Appeal Br. 9). Appellant contends that Liu teaches dissolving a non-hygroscopic sugar substitute and sugar alcohol in water, rather than mixing the components in a melted state (*id.*, citing Liu ¶ 62).

We are not persuaded by Appellant's argument. The Specification describes "the temperature at which the hard crack stage is achieved can vary, depending on the specific makeup of the product mixture but generally is between about 145 °C and about 170 °C" (Spec. 25). Liu teaches various

methods for mixing a non-hygroscopic sugar substitute and a sugar alcohol, including dissolving the components in water (FF 9), and, alternatively, forming a melt mixture (FF 8, 10). Liu teaches using a cooking temperature of 145–170° C in both processes, sufficiently high to drive water from the mix (FF 9–11). Accordingly, Liu teaches heating the melt mixture to a temperature above the hard crack stage, as required by claim 46.

Conclusion of Law

A preponderance of the evidence of record support the Examiner's conclusion that the claims are obvious over the combination of Liu, Chan, and Hansson.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
28–30, 33–39, 41–47	103	Liu, Chan	28–30, 33–39, 41–47	
28–39, 41–47	103	Liu, Chan, Hansson	28–39, 41–47	
Overall Outcome			28–39, 41–47	

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