

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte DOUGLAS B. JOHNSON

Appeal 2008-5983
Application 11/130,081
Technology Center 3700

Decided: January 8, 2009

Before ERIC GRIMES, RICHARD M. LEBOVITZ, and JEFFREY N.
FREDMAN, *Administrative Patent Judges*.

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DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving a claim to endodontic instruments. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

Statement of the Case

Background

“[A]bscessed teeth can be successfully treated to permit retention by a patient for greatly increased health and physiological benefit” (Spec. 2:9-10). The Specification teaches that the “endodontic preparation of a root canal typically includes opening the root canal through the coronal area of the tooth and thereafter manipulating files and reamers within the root canal to physically remove as much as possible of the pulpal material” (Spec. 2:12-14). According to the Specification “in recent times procedures have been developed wherein the root canal is irrigated or flushed with a fluid to remove and/or neutralize organic pulpal material that remains after files and reamers have been employed” (Spec. 2:20-22).

The Claims

Claims 2 and 6-12 are on appeal. We will focus on claims 7, 11, and 12, which are representative and read as follows:

7. A system for delivery of flushing fluid to a tooth root canal comprising:
 - a reservoir of flushing fluid;
 - a positive displacement pump having a fluid inlet in communication with said reservoir and a fluid outlet conduit providing flushing fluid under pulsed pressure;
 - a hand piece having a flow passageway therethrough and having a proximal end connected to receive fluid under pulsed pressure from said fluid outlet conduit and a distal end having connected thereto an injection tube dimensioned and configured for insertion into a tooth root canal; and
 - an ultrasonic energy generator secured to said hand piece whereby flushing fluid under pulsed pressure having ultrasonic energy superimposed thereon is delivered into the root canal.

11. A system according to Claim 7 wherein said pump provides flushing fluid under pressure pulsed at between 2 and 100 pulses per second.

12. A system according to Claim 7 wherein said ultrasonic energy superimposed on said hand piece is at a frequency above about 20,000 Hz.

The prior art

The Examiner relies on the following prior art references to show unpatentability:

Yoshii et al.	US 4,247,288	Jan. 27, 1981
Sicurelli et al.	US 6,162,202	Dec. 19, 2000
Buchanan	US 2003/0157458 A1	Aug. 21, 2003
Nusstein	US 6,948,935 B2	Sep. 27, 2005

The issues

A. The Examiner rejected claims 2, 6, 7, and 9-11 under 35 U.S.C. § 103(a) as obvious over Nusstein and Yoshii (Ans. 3-4).

B. The Examiner rejected claim 8 under 35 U.S.C. § 103(a) as obvious over Nusstein, Yoshii, and Sicurelli (Ans. 4).

C. The Examiner rejected claim 12 under 35 U.S.C. § 103(a) as obvious over Nusstein, Yoshii, and Buchanan (Ans. 4-5).

A. 35 U.S.C. § 103(a) over Nusstein and Yoshii

The Examiner finds that “Nusstein teaches of a dental device for performing endodontic procedure . . . [h]owever, Nusstein fail to disclose a positive displacement pump providing flushing fluid under pulsed pressure” (Ans. 3). The Examiner finds that the “Yoshii et al. explicitly disclose a reciprocating pump, a type of positive displacement pump . . . for pumping

fluid from a vessel (reservoir) into a tooth root canal intermittently in the form of pulsating currents” (Ans. 3). The Examiner find that it “would have been obvious to one having ordinary skill in the art at the time the invention was made to replace Nusstein's pump with Yoshii et al.'s positive displacement pump so that a thorough debridement of the tooth canal can be achieved with the pulsating current of fluid” (*id.* at 4).

Appellant contends that “nothing in Nusstein in view of Yoshii et al. teaches or suggests the benefits of varying pulse pressure over time while simultaneously superimposing ultrasonic frequency on that varying pulse pressure” (App. Br. 8). Appellant contends regarding the pulse pressure frequency that “Yoshii et al. teach away from the applicant's claimed range” (*id.* at 9). Appellant further contends that “Nusstein and Yoshii et al. teach away from Applicant's invention of a low positive pulse pressure rate and a superimposed ultrasonic energy signal. This is a completely new, different and unique teaching not taught nor suggested in the prior art” (*id.* at 10).

Appellant contends that the Examiner has not “presented any articulated reasoning or any rational underpinning to support a conclusion of obviousness” (*id.* at 11).

In view of these conflicting positions, we frame the obviousness issue before us as follows:

Did the Examiner err in concluding that it would have been obvious to replace Nusstein’s syringe pump with Yoshii’s positive displacement pump, rendering claim 7 obvious?

Findings of Fact (FF)

1. Figure 1 of Nusstein is reproduced below:

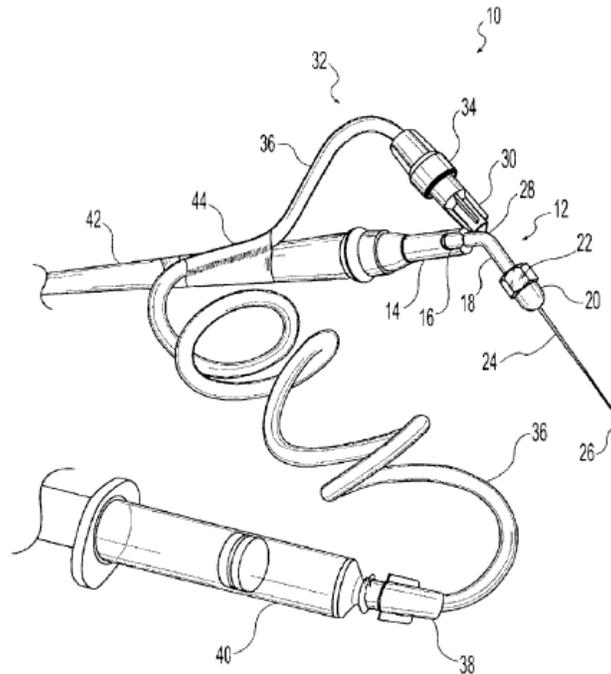


Fig. 1

“FIG. 1 is a perspective view of the dental device of the present invention showing both the shaft assembly and the tubing assembly” (Nusstein, col. 2, ll. 31-33).

2. Nusstein teaches “a device for performing endodontic procedures such as root canals” (Nusstein, col. 1, ll. 49-50).
3. Nusstein teaches that “an irrigating solution, stored in the syringe or other reservoir, may be dispensed into the root canal by depressing the plunger on the syringe or by actuating a pump if another type of reservoir is being used” (Nusstein, col. 4, ll. 28-32).

4. Nusstein teaches “a shaft assembly and a stainless steel hypodermic needle which directs and concentrates the ultrasonic energy at the tip of the needle” (Nusstein, col. 1, ll. 52-54).

5. Nusstein teaches a hand piece where the “[s]haft **18** includes a bore running through its length” and that “shaft **18** further includes aperture **28** which is drilled through shaft **18**” (Nusstein, col. 3, ll. 13-20).

6. Nusstein teaches that the hand piece has two ends, a proximal end and a distal end, where the distal end has an “aperture . . . positioned such that tip **26** of needle **24** can be inserted into the aperture and directed through the bore within shaft **18**” (Nusstein, col. 3, ll. 21-24).

7. Nusstein teaches a proximal end of the hand piece connected to receive fluid where “the end of needle **24** opposite tip **26** includes a connector **30** that permits needle **24** to be attached to a syringe” (Nusstein, col. 3, ll. 29-31).

8. Nusstein teaches connection of the hand piece to an ultrasonic generator, noting that “shaft assembly **12** is threaded onto ultrasonic wand **42**” (Nusstein, col. 3, ll. 65-66).

9. Yoshii teaches an “apparatus for root canal irrigation for treating a decayed tooth by washing the dental focus . . . in the pulp cavity of the tooth” (Yoshii, col. 1, ll. 10-13).

10. Yoshii teaches that “within the root canal irrigator is provided a pumping means for pumping the liquid from the vessel **20**. A typical pumping means is shown in FIG. **3A**” (Yoshii, col. 3, ll. 43-46).

11. The Examiner found that “Yoshii et al. explicitly disclose a reciprocating pump, a type of positive displacement pump . . . for pumping

fluid from a vessel (reservoir) into a tooth root canal intermittently in the form of pulsating currents at a frequency of about 8-58 pulses per second (converted from 500-3500 cycle per minute)” (Ans. 3-4).

12. Yoshii teaches that “liquid is discharged intermittently in the form of pulsating currents while the piston is reciprocating. Experiments show that such currents must be pulsated at a frequency of about 500 to 3,500 cycles per minute to make dental irrigation the most effective” (Yoshii, col. 4, ll. 28-33).

13. Yoshii teaches that dental irrigation with a syringe is “troublesome and not very efficient” (Yoshii, col. 1, ll. 33-34) but that “[b]y using this irrigator it is possible for dentists to reduce the time required for washing teeth and improve the effect of dental irrigation” (Yoshii, col. 4, ll. 65-67).

Principles of Law

The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) secondary considerations of nonobviousness, if any. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). The Supreme Court has recently emphasized that “the [obviousness] analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007).

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* at 1739. “If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability.” *Id.* at 1740. Moreover, an “[e]xpress suggestion to substitute one equivalent for another need not be present to render such substitution obvious.” *In re Fout*, 675 F.2d 297, 301 (CCPA 1982). As noted by the Court in *KSR*, “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” 127 S. Ct. at 1742.

Analysis

Claim 7

Nusstein teaches a device for delivery of flushing fluid to a root canal comprising a reservoir and a pump (FF 1-3). Nusstein further teaches a hand piece with a flow passageway therethrough which has one end connected to receive fluid and the other end configured for insertion into a tooth root canal (FF 4-7). Nusstein teaches that an ultrasonic generator is secured to the hand piece to permit ultrasonic energy to be delivered to the root canal (FF 8). Yoshii teaches delivery of fluid to a root canal using a positive displacement pump which provides flushing fluid under pulsed pressure (FF 9-12).

Applying the *KSR* standard of obviousness to the findings of fact, it would have been obvious to use Yoshii’s positive displacement pump to deliver fluid from the reservoir of Nusstein, since Nusstein teaches that “an irrigating solution . . . may be dispensed into the root canal . . . by actuating a pump” (Nusstein, col. 4, ll. 28-32; FF 3). Further, Yoshii teaches that dental irrigation with a syringe is “troublesome and not very efficient”

(Yoshii, col. 1, ll. 33-34) but that “[b]y using this irrigator it is possible for dentists to reduce the time required for washing teeth and improve the effect of dental irrigation” (Yoshii, col. 4, ll. 65-67; FF 13). The combination of Nusstein and Yoshii uses known elements and combines them in predictable ways. Such a combination is merely a “predictable use of prior art elements according to their established functions.” *KSR*, 127 S. Ct. at 1740.

We are not persuaded by Appellant’s argument that “nothing in Nusstein in view of Yoshii et al. teaches or suggests the benefits of varying pulse pressure over time while simultaneously superimposing ultrasonic frequency on that varying pulse pressure” (App. Br. 8). This asserted benefit, however, is a functional recitation which represents an intended use of the apparatus of claim 7. Apparatus claims must be structurally distinguishable from the prior art, and they must be distinguished from the prior art in terms of structure rather than function. *See In re Schreiber*, 128 F.3d 1473, 1477-78 (Fed. Cir. 1997).

We also are not persuaded by Appellant’s argument that “Nusstein and Yoshii et al. teach away from Applicant's invention of a low positive pulse pressure rate and a superimposed ultrasonic energy signal” (App. Br. 10). Like our appellate reviewing court, “[w]e will not read into a reference a teaching away from a process where no such language exists.” *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1364 (Fed. Cir. 2006). There is no language in either Nusstein or Yoshii which teaches away from the combination of Yoshii’s pump with Nusstein’s ultrasonic endodontal treatment apparatus. “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 in the ... application.” *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004).

Claim 11

We do not find persuasive Appellant’s argument regarding the pulse frequency that “Yoshii et al. teach away from the applicant's claimed range” (App. Br. 9). Yoshii teaches a range of 8-58 pulses per second which falls entirely within Appellant’s claimed range of 2 to 100 pulses per second (FF 11). However, since Yoshii teaches a range which falls within the claimed range, that narrow range anticipates at least that portion of the range. *See Titanium Metals Corp. v. Banner*, 778 F.2d 775, 782 (Fed. Cir. 1985). (“It is also an elementary principle of patent law that when, as by a recitation of ranges or otherwise, a claim covers several compositions, the claim is ‘anticipated’ if *one* of them is in the prior art.”).

Conclusion of Law

The Examiner did not err in concluding that it would have been obvious to replace Nusstein’s syringe pump with Yoshii’s positive displacement pump, rendering claim 7 obvious.

B. 35 U.S.C. § 103(a) over Nusstein, Yoshii, and Sicurelli

The Examiner rejected claim 8 under 35 U.S.C. § 103(a) as obvious over Nusstein, Yoshii, and Sicurelli (Ans. 4).

Claim 8 depends from claim 7. Claim 8 is directed to the apparatus of claim 7 where “said injection tube is flexible” (Claim 8). The Examiner finds that Sicurelli teaches a

flexible syringe needle which discharges pulsating fluid to be used in endodontic procedures such as debriding of root

canals The flexibility of the needle is for it to conformably reach into the root canal. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Nusstein/Yoshii et al. by making the injection tube/needle flexible so that it can conform and reach into the root canal.

(Ans. 4.)

Appellant does not identify any deficiency in the Examiner's reasoning, and as we find none, we affirm the rejection.

C. *35 U.S.C. § 103(a) over Nusstein, Yoshii, and Buchanan*

The Examiner rejected claim 12 under 35 U.S.C. § 103(a) as obvious over Nusstein, Yoshii, and Buchanan (Ans. 4-5).

The Examiner finds that “Nusstein and Yoshii et al. are silent to the frequency of the ultrasonic energy superimposed on the hand piece. Buchanan teaches of a hand held ultrasonic instrument for performing endodontic procedures wherein the transducer 104 that provides ultrasonic energy to the instrument vibrates at the frequency of above 40,000 Hz”

(Ans. 5).

Appellant contends that

if Buchanan teaches what is claimed by the Examiner--that a frequency above 40,000 Hz (cycles per second) is needed to "provide a thorough debridement of the root canal," Office Communication, July 18, 2003, para. 9--then the range of frequency vibration specified by Buchanan is at odds with the frequency specified by Nusstein (above 20,000 Hz). This situation would leave a person of ordinary skill confused as to which range is the correct range to use for debridement of the root canal.

(App. Br. 12.)

In view of these conflicting positions, we frame the obviousness issues before us as follows:

Did the Examiner err in concluding that it would have been obvious to impose ultrasonic energy at “a frequency above about 20,000 Hz” as required by claim 12?

Findings of Fact

13. The Examiner finds that “Nusstein and Yoshii et al. are silent to the frequency of the ultrasonic energy superimposed on the hand piece” (Ans. 5).

14. Buchanan teaches a frequency of 40,000 Hz in an ultrasonic dental tool (*see* Buchanan ¶ 0030).

Principles of Law

In patent prosecution the examiner is entitled to reject application claims as anticipated by a prior art patent without conducting an inquiry into whether or not that patent is enabled or whether or not it is the claimed material (as opposed to the unclaimed disclosures) in that patent that are at issue. . . . The applicant, however, can then overcome that rejection by proving that the relevant disclosures of the prior art patent are not enabled.

Amgen Inc. v. Hoechst Marion Roussel, Inc., 314 F.3d 1313, 1355 (Fed. Cir. 2003).

Analysis

As discussed above, Nusstein and Yoshii teach all of the limitations of claim 7 (FF 1-12). Buchanan teaches the use of a frequency of 40,000 Hz in an ultrasonic dental tool for root canals (FF 14).

Appellant argues that “the range of frequency vibration specified by Buchanan is at odds with the frequency specified by Nusstein (above 20,000 Hz)” (App. Br. 12). Appellant never specifically identifies where Nusstein teaches a specific ultrasonic frequency, simply stating Nusstein’s frequency as a fact without any support (*see* App. Br. 12). The Examiner finds that Nusstein is silent with regard to frequency (FF 13). We have carefully reviewed Nusstein and do not find any specific frequency given. Consequently, Appellant’s argument is unsupported, since there is no explicit contradiction between the teachings of Nusstein and Buchanan.

However, even if Nusstein taught a frequency of greater than 20,000 Hz while Buchanan teaches a frequency of above 40,000 Hz, no contradiction would exist. The prior art would simply suggest that two ranges are possible, one of at least 20,000 Hz and the other of at least 40,000 Hz. Since either range would satisfy the requirement of claim 12, which requires a “frequency above about 20,000 Hz,” claim 12 would be obvious under either construction of the prior art. *See KSR*, 127 S. Ct. at 1740. (“If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability.”).

We also do not find Appellant’s argument persuasive regarding Buchanan’s teaching that the frequencies may include a range “below 20,000 Hz. and substantially above 40,000 Hz” (Buchanan ¶ 0030). “[T]he

existence of overlapping or encompassing ranges shifts the burden to the applicant to show that his invention would not have been obvious.” *In re Peterson*, 315 F.3d at 1330. Appellant has not made any showing regarding the claimed range of ultrasonic frequencies and Buchanan expressly suggests that the “term ‘ultrasonic’ is generally understood to mean the transducer vibrates at a frequency above the threshold of human hearing, typically above 20,000 Hz.” (Buchanan ¶ 0030).

Conclusions of Law

The Examiner did not err in concluding that it would have been obvious to impose ultrasonic energy at “a frequency above about 20,000 Hz” as required by claim 12.

SUMMARY

In summary, we affirm the rejection of claims 7 and 11 under 35 U.S.C. § 103(a) over Nusstein and Yoshii. Pursuant to 37 C.F.R. § 41.37(c)(1)(vii)(2006), we also affirm the rejection of claims 2, 6, 9, and 10 as these claims were not argued separately. We affirm the rejection of claim 8 under 35 U.S.C. § 103(a) as obvious over Nusstein, Yoshii, and Sicurelli. We also affirm the rejection of claim 12 under 35 U.S.C. § 103(a) as obvious over Nusstein, Yoshii, and Buchanan.

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)(2006).

AFFIRMED

Appeal 2008-5983
Application 11/130,081

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