

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WILLIAM A. BURRIS
and PHILIP M. PRINSEN

Appeal 2007-4305
Application 10/074,992
Technology Center 1700

Decided: January 9, 2008

Before BRADLEY R. GARRIS, CATHERINE Q. TIMM, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the decision of the Examiner finally rejecting claims 1-5 and 7-31, the only claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM-IN-PART¹ and REMAND.

¹ The decision of the Examiner is affirmed as to claims 1-4, 7-13, 15, 18, 20-22, 24, and 26.

The invention relates to a system for disinfecting water and water lines used, for example, in dental office water systems. (Spec. 1). Claim 1 is illustrative of the invention and is reproduced below:

1. A device for disinfecting operatory unit water and lines, comprising:

a liquid source such as a pressurized water line or a reservoir;

an ozone generator using a corona discharge to produce an ozone containing gas;

a protection system that prevents liquids from the liquid source from entering the ozone generator;

an ozone mixing system that mixes and dissolves the ozone containing gas in the liquid;

a circulation system that circulates the liquid containing dissolved ozone through a pressurized liquid circulation loop connected to the operatory unit;

a separation system that separates undissolved gas from the ozonated liquid prior to circulating the ozonated liquid through the circulation passageway;

a reducing system the prevents ozone in the separated gas from escaping into the atmosphere by passing the gas through an ozone reducing material before venting; and

a liquid admitting system that inputs liquid from the liquid source into the mixing system to replace liquid output to the operatory unit.

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

Burris	U.S. 5,207,993	May 4, 1993
Contreras	U.S. 5,824,243	Oct. 20, 1998

The Examiner made the following rejections:

1. Claims 1-5 and 7-31 under 35 U.S.C. § 103 as unpatentable over Contreras in view of Burris.

2. Claims 1-5 and 7-31 under 35 U.S.C. § 103 as unpatentable over Engelhard in view of Burris.

Rejection of claims 1-5 and 7-31 under 35 U.S.C. § 103 as unpatentable over Contreras in view of Burris

Appellants do not present separate arguments as to claims 3, 7-11, 15, 18, 21, 22, and 26. Accordingly, we decide the rejection as to these claims on the basis of independent claim 1. *See* 37 C.F.R. § 41.37(c)(1)(vii). We do not address the merits of this rejection as to claims 2, 4, 5, 12-14, 16, 17, 19, 20, 23-25, and 27-31 for the reasons discussed below. *See, infra*, REMAND TO THE EXAMINER.

The Examiner finds that Contreras discloses the invention as claimed in claim 1 with the exception of an ozone off gas destruction means. (Ans. 3). The Examiner contends that “[i]t would have been well within the purview of one of ordinary skill in the art to employ the ozone off-gas destruction means of Burris in the system of Contreras, because it would provide for the safe disposal of that off-gas if the system requires abrupt shut-down which would not allow for the time consuming, natural dissipation of the off-gas as required by return of the off-gas to the reservoir.” (Ans. 4).

Appellants contend that Contreras does not teach a separation system where undissolved gas is separated from the ozonated liquid prior to

circulation. (Reply Br. 8). Appellants further contend that Contreras teaches away from Burris' ozone off-gas destruction means which allows venting of separated gas to the atmosphere. (Reply Br. 6). More specifically, Appellants maintain that Contreras discloses a closed system that appears to preclude the inclusion of a vent of any kind. (Reply Br. 7).

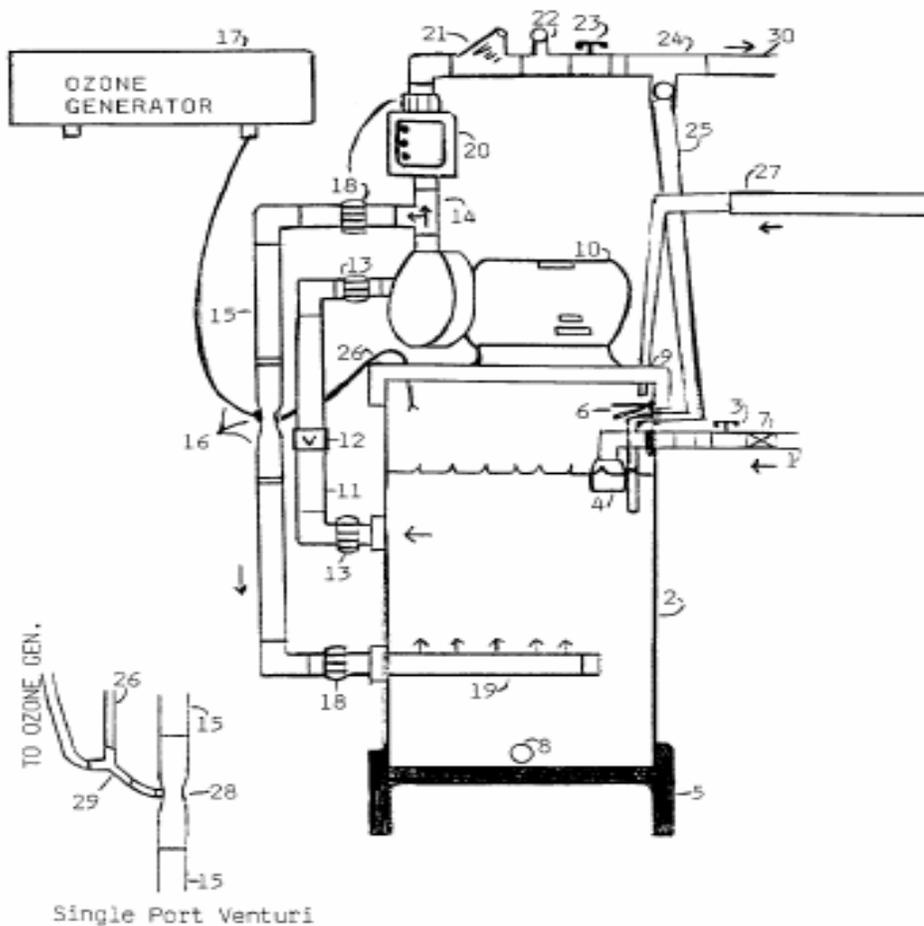
The first issue before us with respect to this ground of rejection is: Has the Examiner properly identified a teaching or suggestion of a separation system where undissolved gas is separated from the ozonated liquid prior to circulation? We answer this question in the affirmative. The second issue we consider is: Has the Examiner provided a reasonable basis to conclude that one of ordinary skill in the art at the time of the invention would have been motivated to modify Contreras' system to include Burris' ozone off-gas destruction means? We likewise answer this question in the affirmative. Therefore, we also address a third issue: Have Appellants shown that Contreras teaches away from the Examiner's proposed modification? We determine that Appellants have not. Our reasoning is discussed in detail below.

Findings of Fact:

- 1) Contreras discloses a water ozonating system which "incorporates at least the following: a water inlet means, a water storage tank, a device for introducing ozone into the water in the storage tank, and a device for dispensing water from the storage tank." (Abstract). According to Contreras, the system may be used in such applications as residential and office water purification and dental operatory procedures. (Abstract).
- 2) Contreras states that "[a] unique and particularly advantageous feature of the Water Ozonating System is that the ozonated water is kept

entirely within a closed system until it is dispensed to the user. This maintains ozone in the water and in its active state (i.e., with its decontaminating and sterilizing effect).” (Abstract).

- 3) According to Contreras, “the ozonating means is structured in such a way that the water in the tank is either periodically or continuously ozonated.” (Col. 2, ll. 9-11).
- 4) The sole figure in Contreras is shown below:



- 5) The Figure in Contreras shows:

A liquid source, i.e., storage tank 2 having inlet port 1 for connection to any location of incoming water. (Col. 2, ll. 57-59).

An ozone generator 17 which can be a corona discharge or Ultraviolet light type for producing an ozone containing gas. (Col. 3, ll. 39-40).

A protection system which prevents liquid from entering the ozone generator 17, i.e., a dual port venturi/check valve (or a single port venturi 28) connected to water line 15. (Col. 3, ll. 36-39).

An ozone mixing system, i.e., a dual port venturi/check valve and tubing 16 are “used to draw and mix ozone from an ozonator 17 into the recirculating water.” (Col. 3, ll. 36-38).

A circulation system, i.e., water is drawn from storage tank 2 through water line 11. A tee 14 is positioned at the discharge of pump/motor 10 to allow water to flow when needed upon demand and simultaneously recirculate water back to the storage tank 2 via a water line 15. (Col. 3, ll. 21-23 and 27-31).

A separation system, i.e., a flexible tube 26 having one end connected to a suction port of venturi 16 and the other end positioned near the bottom of the lid 9 is used to capture and reuse any excess ozone in storage tank 2. (Col. 4, ll. 11-15).

A liquid admitting system wherein, “[w]hen any amount of active-ozonated water is used; [sic] the system provides for automatic replenishment of fresh water.” (Col. 2, ll. 53-54).

- 6) The system further includes “two unions 13 for quick disconnect and service to the pump/motor 10” (Contreras, col. 3, ll. 26-27), “unions 18 for quick disconnect and servicing to the system . . . [and] a ball valve

23 is positioned to shut off for servicing the system” (Contreras, col. 3, ll. 42-44 & 52-53).

- 7) Burris discloses a water purification system which includes an ozone sensor 25 used to detect the presence of dissolved ozone in reservoir 36. (Col. 5, ll. 29-30). Burris teaches that purified water may be passed through a filter 42 to reduce the dissolved ozone before the purified liquid is output for use or consumption. (Col. 5, ll. 54-58).

In order to establish a prima facie case of obviousness, the Examiner must show that each and every limitation of the claim is described or suggested by the prior art or would have been obvious based on the knowledge of those of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988). In our view, the Examiner properly identified features in Contreras which correspond to the claimed separation means. (Ans., para. bridging 6-7). Contreras appears to separate the gas from liquid by gravity in the same manner as Appellants. *Compare* Finding of Fact 5 (separation system) *with* Specification, p. 5, ll. 29-30 (“The ozone containing gas is separated from the liquid after mixing, preferably by gravity in the treatment chamber 14”). Thus, the burden to prove that Contreras does not disclose the claimed separation means was properly shifted to Appellants. *See In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997); *In re Best*, 562 F.2d 1252, 1255 (CCPA 1977). Merely arguing that Contreras does not teach a separation system (Reply 8) is not sufficient to satisfy this burden.

In *KSR Int'l Co. v. Teleflex Inc.*, the Supreme Court set aside any “rigid” application of the teaching, suggestion, motivation (“TSM”) test, advising that: “A person of ordinary skill is also a person of ordinary

creativity, not an automaton.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1742 (2007). The Supreme Court clarified that while “it can be important to identify 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. . . . the analysis need not seek out precise teachings [in the prior art] directed to the specific subject matter of the challenged claim.” *Id.* at 1741.

Contrary to Appellants’ contention, we find that the facts and reasons relied on by the Examiner provide a reasonable basis to conclude that one of ordinary skill in the art would have been motivated to employ the ozone off-gas destruction means of Burris in the system of Contreras (*see* Ans. 6). Appellants argue that “it remains unclear what the Examiner relies upon for teaching [sic, teaching] such a suggestion.” (Reply Br. 7). In our view, however, the Examiner clearly explained that Contreras contemplates two different modes of operation, i.e., an active mode in which ozonated water is available for use and a system shut down mode. In the active mode, a closed system is maintained and ozone gas is returned to the circulating water. (Ans. 3). However, in the shut-down mode, quick disconnect components are employed to allow access to/servicing of various system components (Finding of Fact 6), such that the system is no longer closed. (Ans. 6). The Examiner’s proposed use of Burris’ ozone off-gas destruction means is limited to this shut-down mode. In other words, the Examiner proposes *addition* of Burris’ ozone off-gas destruction means to Contreras’ system for handling the ozone off-gas at system shut down, *not substitution* of Burris’ ozone off-gas destruction means for Contreras’ ozone recirculation system. We fail to see how such use is inconsistent with, or would frustrate,

Contreras' goal of maintaining a closed system in the *active* mode as argued by Appellants (Reply Br. 7).

Accordingly, we find that a preponderance of the evidence weighs in favor of the Examiner's conclusion that claims 1, 3, 7-11, 15, 18, 21, 22, and 26 are unpatentable over the combined teachings of Contreras and Burris.

Rejection of claims 1-5 and 7-31 under 35 U.S.C. § 103 as unpatentable over Engelhard in view of Burris

Appellants do not present separate arguments as to claims 2, 3, 4, 7, 9-13, 15, 18, 20-22, 24, and 26. Accordingly, we decide the rejection as to these claims on the basis of independent claim 1. *See* 37 C.F.R. § 41.37(c)(1)(vii). We do not address the merits of this rejection as to claims 5, 8, 14, 16, 17, 19, 23, 25, and 27-31 for the reasons discussed below. *See, infra*, REMAND TO THE EXAMINER.

The Examiner finds that Engelhard discloses the invention as claimed with the exception that Engelhard employs a UV generator rather than a corona discharge generator for production of ozone. (Ans. 4-5). The Examiner contends that it would have been obvious to one of ordinary skill in the art at the time of the invention to have substituted the corona discharge ozone generation means of Burris for the UV generator of Engelhard because of their conventionally recognized functional equivalence. (Ans. 5).

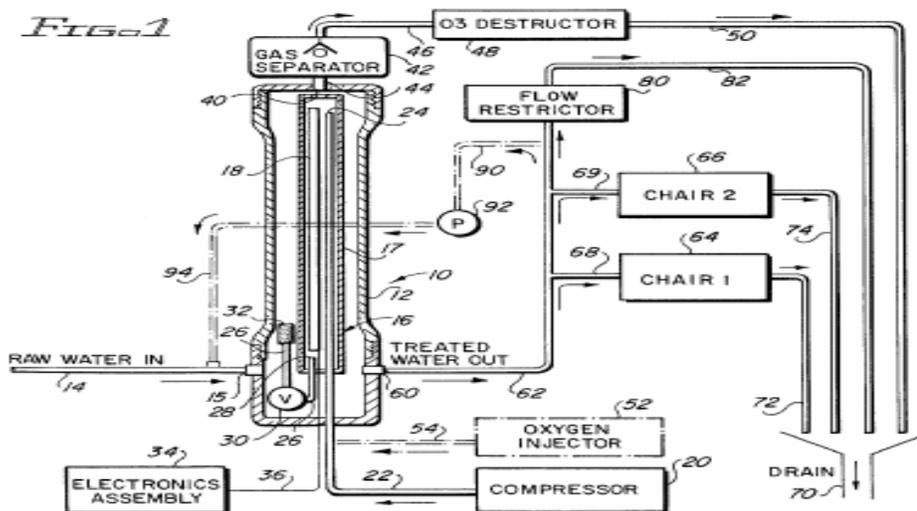
Appellants argue that Engelhard and Burris are not properly combinable because Engelhard clearly teaches that ozone enriched air is entrained in the water in bubbles while Burris teaches against the circulation of ozone gas in water. Appellants contend that one of ordinary skill in the art would not have been motivated to substitute the UV generator in

Engelhard with Burriss' corona discharge generator because such substitution would require significant alterations to the design of Engelhard's system. (Br. 23).

The first issue presented with respect to this ground of rejection is: Has the Examiner provided a reasonable basis to conclude that one of ordinary skill in the art at the time of the invention would have been motivated to substitute the UV generator of Engelhard with a corona discharge generator? We answer this question in the affirmative. Therefore, we also address a second issue: Have Appellants established that the prior art teaches away from the Examiner's proposed modification? We determine that Appellants have not. Our reasoning is discussed in detail below.

The following additional enumerated findings of fact are relevant to our consideration of this issue.

8) Figure 1 of Engelhard is shown below:



9) Engelhard Figure 1 shows:

A liquid source, i.e., water line 14 supplies water to container 12. (Col 3, ll. 36-37).

An ozone generator 16 for producing an ozone containing gas. (Col. 3, l. 37). Generator 16 is an ultraviolet light type generator. (Col. 3, ll. 37-39).

A protection system—“ozone enriched air flows into pipe 26 through inlet 28. A check valve 30 in pipe 26 prevents reverse flow therethrough.” (Col. 3, ll. 51-53).

An ozone mixing system—“Pipe 26 is terminated by a sparger 32. The sparger emits the ozone enriched air in the form of tiny bubbles which become readily entrained in the water in and flowing through container 12.” (Col. 3, ll.53-56).

A circulation system—“a return line 90 is in fluid communication with conduit 62 downstream of the last branch leading to a dental chair. Ozonated water from conduit 62 is drawn into the return line by a pump 92. The pump conveys the ozonated water through return line 94 into water line 14 upstream of inlet 15 in container 12. Thus, the ozonated water flowing through the return lines, which water may have a lowered concentration of entrained ozone, is reintroduced to the ozone generator.” (Col. 4, ll. 29-37).

A separation system—“To prevent an accumulation of ozone enriched air within container 12, any such gaseous compound is evacuated through an outlet 40 leading to a gas separator 42 through a pipe 44.” (Col. 3, ll. 60-63).

An ozone reducer--Outflow from the gas separator is through a pipe 46 to an ozone destructor 48. (Col. 3, ll. 63-65).

A liquid admitting system, i.e., water line 14 supplies water to container 12. (Col 3, ll. 36-37).

“[A]nalysis [of whether the subject matter of a claim would have been obvious] 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, 1740-41 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336-337 (Fed. Cir. 2006)). See *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006) (“The motivation need not be found in the references sought to be combined, but may be found in any number of sources, including common knowledge, the prior art as a whole, or the nature of the problem itself.”). In this case, the Examiner determined that Engelhard discloses the invention as claimed with the exception of a corona discharge generator for production of ozone. Appellants do not challenge this determination and we find that it is reasonably supported by Findings of Fact 8 and 9. The Examiner further found that the functional equivalence of corona discharge and UV generators for ozone production was a matter of common knowledge to those of ordinary skill in the art at the time of the invention. (Ans. 5). This finding was also properly supported by the Examiner’s reliance on Contreras to establish the state of the art at the time of the invention.² (Ans.

² We do not agree with Appellants’ contention that the Examiner improperly relied on Contreras for a suggestion that a UV ozone generator may be substituted for a corona generator. (Br. 23). In our view, Contreras is clearly relied on only as evidence of the state of the art at the time of the invention.

8). The Examiner then reasonably concluded that it would have been obvious to the ordinary artisan at the time of the invention to have substituted the UV generator of Engelhard with the corona discharge generator of Burriss. (Ans. 5). Accordingly, we find that the Examiner properly established a prima facie showing of obviousness as to appealed claims 1-4, 7, 9-13, 15, 18, 20-22, 24, and 26. *KSR*, 127 S. Ct. at 1739 (“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”).

Once the Examiner establishes a prima facie showing of obviousness, the burden shifts to the Appellants to come forward with evidence or argument in rebuttal. *In re Soni*, 54 F.3d 746, 749 (Fed. Cir. 1995). We have considered Appellants’ arguments in support of nonobviousness, but conclude that a preponderance of the evidence favors the Examiner’s determination of obviousness for the following reasons.

Appellants first argue that Engelhard and Burriss are not properly combinable. This argument is not persuasive because it fails to address the Examiner’s proposed combination. The Examiner relies on Burriss solely for a disclosure of a corona generator for production of ozone used in water purification. Appellants have not explained why any difference in the circulating liquids of Engelhard and Burriss (Br. 22) would have dissuaded the ordinary artisan from substituting one type of ozone generator (UV) for another type (corona discharge).³

³ Additionally, this argument is not persuasive because Appellants have not provided factual support for their interpretation of Burriss as teaching away from circulation of ozone gas in water (Br. 22). (*see, infra*, Findings of Fact 10 and 11).

While Appellants' second argument does address the Examiner's proposed combination, the argument is not persuasive because it lacks evidentiary support. More specifically, we have no way of evaluating whether the alterations necessary to substitute the UV generator in Engelhard with Burris' corona discharge generator (Br. 23) would have dissuaded the ordinary artisan from substituting devices which the Examiner has shown to be functional equivalents. *Cf. In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994)("A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant."). As explained in *Ex parte Gray*, 10 USPQ2d 1922, 1928 (BPAI 1989), "[t]he reason for requiring evidence in declaration or affidavit form is to obtain the assurance that any statements or representations made are correct, as provided by 35 U.S.C. § 25 and 18 U.S.C. § 1001."

Accordingly, we find that a preponderance of the evidence weighs in favor of the Examiner's conclusion that claims 1-4, 7, 9-13, 15, 18, 20-22, 24, and 26 are unpatentable over the combined teachings of Engelhard and Burris.

REMAND TO THE EXAMINER

The ultimate determination of whether an invention would have been obvious is a legal conclusion based on underlying findings of fact. *In re Dembiczak*, 175 F.3d 994, 998 (Fed. Cir. 1999). Therefore, in rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner

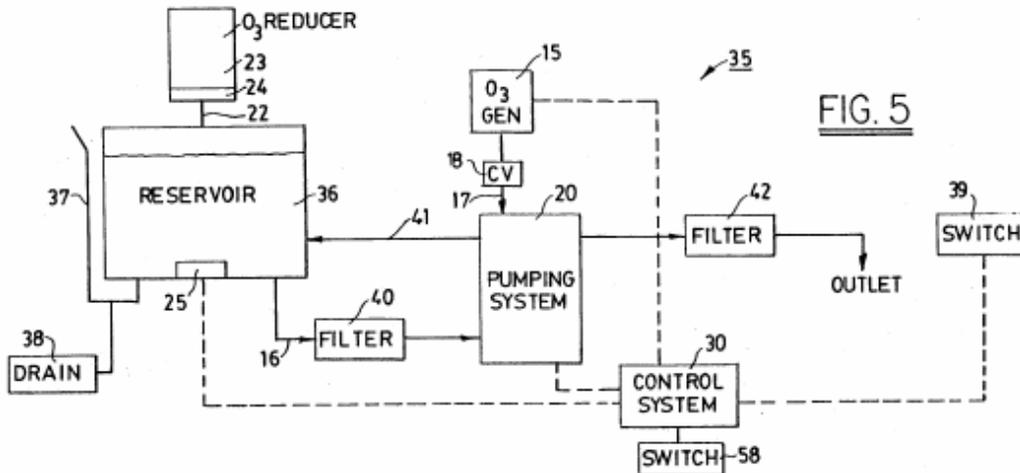
must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966).

With respect to each of the argued dependent claims, the Examiner has not clearly identified those portions of the references relied upon for a disclosure of the claimed features. Since we are a Board of review, we will not speculate as to what correlations between the prior art and claim features the Examiner may have intended.

Therefore, we remand this application to the jurisdiction of the Examiner pursuant to 37 C.F.R. § 41.50(a)(1) for preparation of a Supplemental Examiner's Answer clarifying how the limitations in claims 2, 4, 5, 12-14, 16, 17, 19, 20, 23-25, and 27-31 correspond to features in Contreras and Burriss and how the limitations in claims 5, 8, 14, 16, 17, 19, 23, 25, and 27-31 correspond to features in Engelhard and Burriss. The Supplemental Examiner's Answer should be drafted following the guidelines of MPEP § 1207.02 which provide, *inter alia*, that "[t]he comparison must align the language of the claim side-by-side with a reference to the specific page, line number, drawing reference number, and quotation from the prior art, as appropriate." As to each of the argued dependent claims, the Supplemental Examiner's Answer must provide "[a] statement of whether the examiner disagrees with each of the contentions of appellant in the brief with respect to the issues presented and an explanation of the reasons for disagreement with any such contention. The examiner must use headings and subheadings paralleling the headings and subheadings utilized in the appellant's brief." MPEP § 1207.02. The Examiner "should not refer, either directly or indirectly, to any prior Office action without fully restating the point relied on." *Id.*

OTHER ISSUES

In the event of future prosecution, the Examiner may wish to consider whether the claims are unpatentable under 35 U.S.C. § 103 over Burris, either alone or as modified in view of Contreras or Engelhard. Figure 5 of Burris is shown below:



Burris Figure 5 shows “an in-line system for pumping liquid from a reservoir to a purified liquid container while contacting the liquid with ozone to ensure its purification.” (Col. 1, ll. 60-63). The system 35 includes:

A liquid source, i.e., reservoir 36, which can be refilled on a batch basis preferably via trap 37 or from a pressurized supply line. (Col 5, ll. 28-29; col. 7, ll. 35-37);

An ozone generator 15 for producing an ozone containing gas. (Col. 2, ll. 56-58). Generator 15 is preferably a corona discharge generator. (Col. 2, ll. 62-64).

A protection system, check valve 18, “that allows gas to pass through but prevents any liquid backflow from reaching generator 15.” (Col. 2, ll. 59-62).

An ozone mixing system, pumping system 20, “contacts the liquid with ozone containing gas from generator 15 so that the liquid is purified.” (Col. 2, ll. 46-49).

A circulation system, i.e., circulation loop, draws liquid from reservoir 36 via line 16 through pumping system 20 and returns purified liquid to the reservoir via line 41. (Col. 5, ll. 59-67).

A separation system, i.e., reservoir 36, for separating gas and liquid from the ozonated liquid prior to circulation. (Col. 5, ll. 24-25).

A reducing system, i.e., ozone reducer 23, containing a material for reducing the concentration of ozone in any gas entering the atmosphere. (Col. 3, ll. 25-27).

A liquid admitting system, i.e., trap 37, for adding liquid to reservoir 36. (Col. 7, ll. 4-5).

ORDER

The decision of the Examiner rejecting claims 1-5 and 7-31 under 35 U.S.C. § 103 as unpatentable over Contreras in view of Burriss is affirmed as to claims 1, 3, 7-11, 15, 18, 21, 22, and 26.

The decision of the Examiner rejecting claims 1-5 and 7-31 under 35 U.S.C. § 103 as unpatentable over Engelhard in view of Burriss is affirmed as to claims 1, 2, 3, 4, 7, 9-13, 15, 18, 20-22, 24, and 26.

We do not address the merits of the rejections as to claims 2, 4, 5, 8, 12-14, 16, 17, 19, 20, 23-25, and 27-31, but instead remand the application to the Examiner for the reasons discussed above. This Remand to the Examiner pursuant to 37 C.F.R. § 41.50(a)(1) is made for further consideration of a rejection. Accordingly, 37 C.F.R.

§ 41.50(a)(2) applies if a supplemental examiner's answer is written in response to this Remand by the Board.

In order to preserve Appellants' right to seek review under 35 U.S.C. §§ 141 or 145 with respect to the affirmed rejections of claims 1-4, 7-13, 15, 18, 20-22, 24, and 26, we defer the effective date of the affirmance until conclusion of the prosecution before the Examiner unless, as a mere incident to the limited prosecution, the affirmed rejections are overcome.⁴ If prosecution before the Examiner does not result in allowance of the application, abandonment or a second appeal, this case should be returned to the Board of Patent Appeals and Interferences for final action on the affirmed rejections, including any timely request for rehearing thereof.

⁴ We note that Appellants may file a reply brief to a supplemental examiner's answer as provided in 37 C.F.R. § 41.41.

Appeal 2007-4305
Application 10/074,992

AFFIRMED-IN-PART and REMANDED

PL Initials:
sld

BASCH & NICKERSON LLP
1777 PENFIELD ROAD
PENFIELD, NY 14526