

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROBERT J. SACCOMANNO

Appeal 2008-4476
Application 10/284,709
Technology Center 1700

Decided: November 21, 2008

Before BRADLEY R. GARRIS, LINDA M. GAUDETTE, and
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134 the final rejection of claims 1-3, and 8-24. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 6(b).

We REVERSE.

INTRODUCTION

Appellant claims a system to disinfect air using ultraviolet radiation, said system comprising, in relevant part, “total internal reflecting features [120] disposed upon at least a portion of at least one of the elongate surfaces of said air inlet tube [110]” (claim 1; Figure 5).

Claim 1 is illustrative:

1. A system to disinfect air using ultraviolet radiation (UV), said system comprising:
 - (a) an air inlet tube (110) comprising an entrance end (111), a distally opposing exit end (112), an elongate internal surface (121) in contact with said air, and an elongate external surface;
 - (b) total internal reflecting features disposed upon at least a portion of at least one of the elongate surfaces of said air inlet tube;
 - (c) an air containment vessel (130) disposed around said air inlet tube;
 - (d) an ultraviolet inlet window (135) that allows penetration of said air containment vessel by ultraviolet radiation but prevents passage therethrough of air;
 - (e) a high intensity ultraviolet lamp (40) providing ultraviolet radiation that passes through said ultraviolet inlet window and impinges upon the internal surface of said air inlet tube; and
 - (f) an air outlet (150) extending from said air containment vessel.

The Examiner relies on the following prior art references as evidence of unpatentability:

Schenk	4,255,383	Mar. 10, 1981
Scroggins	5,742,063	Apr. 21, 1998
McGaffigan	6,160,948	Dec. 12, 2000
Horton, III	6,447,720 B1	Sep. 10, 2002

The rejections as presented by the Examiner are as follows:

1. Claims 1, 3, and 8-23 are rejected under 35 U.S.C. § 103 as being unpatentable over Horton, III in view of McGaffigan.
2. Claim 2 is rejected under 35 U.S.C. § 103 over Horton, III in view of McGaffigan and Schenck.
3. Claim 24 is rejected under 35 U.S.C. § 103 over Horton, III in view of McGaffigan and Scroggins.

Appellant separately argues independent claims 1, 10, and 18.

Because Appellant argues the same or similar features with regard to claims 1, 10, and 18, we address rejection 1 with respect to claim 1.

STATEMENT OF THE CASE

The Examiner finds that Horton, III teaches all the features of claim 1, except the “total internal reflecting features on the internal surfaces of the system” (Ans. 3-4). The Examiner finds that McGaffigan discloses a light pipe that uses the principle of total internal reflection within a hollow tube (Ans. 4). Based on these disclosures, the Examiner concludes that it would have been obvious to

further modify Horton[’s] apparatus by placing a retroreflective end feature at the opposite side of the UV source in the inlet tube (figure 5:51A) or on Horton’s elongate internal surface as taught by McGaffigan in

order to reflect light rays back towards the light source resulting in a more uniform emitted light from the end opposite the light source (McGaffigan, col.15, lines 7-13, col.20, lines 55-57 and col.15, lines 43-45) since reflecting UV rays would lead to an increase in the dose applied to fluids and would obviate the need to place the light sources on the optical centerline of the retroreflective ends

(Ans. 4).

Appellant argues that the Examiner's motivation is based on impermissible hindsight and that there is no motivation to combine Horton, III and McGaffigan in the manner proposed by the Examiner (App. Br. 11-12). Appellant contends that any advantage stated by the Examiner regarding the use of total internal reflection (TIR) on the elongate portions of the inlet tube is derived from Appellant's Specification, not the prior art (App. Br. 12). Appellant argues that neither McGaffigan nor Horton, III teaches or suggests the TIR features that are disposed upon at least a portion of at least one of the elongate surfaces of an air inlet tube (App. Br. 12).

ISSUE

The issue presented in this appeal is: did Appellant establish that the Examiner's obviousness conclusion is based on impermissible hindsight and that McGaffigan and Horton, III fail to teach or suggest "total internal reflecting features disposed upon at least a portion of at least one of the elongate surfaces of said air inlet tube" as recited in claim 1? We answer this question in the affirmative.

FACTUAL FINDINGS (FF)

Specification

1. The Specification states that using total internal reflection (TIR) “maximizes the overall system efficacy by containing the UV” rays and “allowing it more opportunity to interact with the air stream” (Spec. ¶ [0026]).
2. The Specification further states that TIR “ensures that all the input UV radiation is dissipated in the air” (Spec. ¶ [0007]).

Horton, III

3. Horton, III discloses a system for ultraviolet disinfection of fluids (col. 1, ll. 6-8).
4. Horton, III discloses using and positioning multiple lamps to provide sufficient UV light to disinfect the fluid (col. 2, ll. 53-59; col. 3, ll. 57-62).
5. Horton, III discloses that the UV light source “is not submerged in the fluid to be disinfected” (col. 7, ll. 34-35).
6. The UV light source may contain optical components, such as reflectors, shutters, lenses, which may be used in combination to achieve the desired control and output of the UV light rays (col. 7, ll. 46-53; col. 8, ll. 33-43).
7. The optical components are positioned between the UV light source (36) and the UV light source system output point (i.e., the bottom of the UV light source system (34)) (Figure 3; col. 8, ll. 35-37).
8. Horton, III uses lamps with reflectors and light pipes attached thereto to direct the light (Figures 4A-4D, 7A-7D).
9. Figure 7B illustrates a tubular light source with a light pipe (Horton, III, Fig. 7B).

10. Horton, III discloses that using the optical components “increases the overall effectiveness” of the system (col. 11, ll. 65-67; col. 12, ll. 14-16).
11. Horton, III does not disclose placing any of the optical components on the inlet tube 51A or in UV dose zones 52 or 53 as shown in Figure 5.
12. Horton, III’s Figure 5 illustrates a UV light source 56 emitting UV light rays 55 substantially parallel to the longitudinal axis of the light source toward the UV dose zones 52, 53, and the inlet tube 51A (Fig. 5).

McGaffigan

13. McGaffigan discloses light pipes that “give the appearance of a laser beam being emitted axially within the light pipe” and “provide highly efficient radial and axial distribution of light” (col. 1, ll. 14-18).
14. McGaffigan’s light pipes emit “light rays in a substantially radial direction” (col. 3, ll. 21-22).
15. McGaffigan’s retroreflective elements 45, 55 reflect light rays back into the prismatic elements, or the retroreflective elements may be omitted to permit light to be released from the end of the light pipes (col. 7, ll. 47-52).
16. The retroreflective element 267 in Figure 18B reflects light back toward the light source to emit a more uniform light from the end of the simulated laser light system (SLLS) opposite the light source (col. 15, ll. 7-13).
17. McGaffigan discloses that the light pipes are used, for example, in toys, displays, or vehicle brake lights (col. 24, ll. 61-65).

18. McGaffigan does not disclose a device that has an air or fluid inlet tube.

PRINCIPLES OF LAW

A claimed invention “composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007). Often it will be necessary “to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed.” *Id.* at 1740-41. “A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant on *ex post* reasoning.” *Id.* at 1742 (citing *Graham v. John Deere Co.*, 383 U.S. 1, 36 (1966), which warned against a “temptation to read into the prior art the teachings of the invention in issue”).

For a prima facie case of obviousness all the claim features must be taught or suggested by the applied prior art. *In re Royka*, 490 F.2d 981, 985 (CCPA 1974).

ANALYSIS

The Examiner indicated two reasons for combining McGaffigan’s total internal reflective features with the elongate portion of Horton, III’s inlet tube 51A: (1) “to reflect light rays back towards the light source

resulting in a more uniform emitted light from the end opposite the light source since reflecting UV rays would lead to an increase in the dose applied to fluids” and (2) to “obviate the need to place the light sources on the optical centerline of the retroreflective ends” (Ans. 4) (references omitted).

The “increase in the dose [of UV light] applied to the fluids” portion of reason (1) is not found in the prior art and the Examiner has not established that such reason would have been within the knowledge of one of ordinary skill in the art absent Appellant’s disclosure. Rather, reason (1) appears to be improperly derived from Appellant’s Specification that teaches that the air containment vessel 130 maximizes the overall system efficacy by containing the UV rays, allowing them more opportunity to interact with the air stream (FF 1 and 2).

With regard to reason (2), it is unclear how placing McGaffigan’s reflective surfaces of the light pipe along Horton, III’s elongate surface of the inlet tube 51A and the portion of the inlet tube extending into dose zones 52 and 53 would obviate the need to place the light source along the optical centerline. Horton, III shows the UV light source positioned above the inlet tube with parallel UV light rays emanating from it toward the inlet tube (FF 12), such that there would appear to be no reason to place McGaffigan’s reflective elements of the light pipe along the elongate surface of the inlet tube to obviate the need to place Horton, III’s light along the optical centerline of the retroreflective element of a light pipe.

In fact, the only light pipe disclosed by Horton, III is shown connected to a tubular lamp as a possible UV light source (Figure 7B) (FF 8, 9). Accordingly, the only combination possibly suggested by the applied prior art would have been McGaffigan’s light pipe reflective elements with

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Horton, III's light pipe as part of the UV light source. However, such a combination fails to teach or suggest placing McGaffigan's reflective elements along the elongate surfaces of Horton, III's inlet tube 51A and the portions extending into dose zones 52 and 53 (FF 10). In other words, neither McGaffigan nor Horton, III teaches or suggests placing "total internal reflecting features" along elongate surfaces of the inlet tube as claimed (FF 10, 18). The only disclosure to place the total internal reflecting elements on an inlet pipe comes from Appellant's Specification.

For the above reasons, we determine that neither McGaffigan nor Horton, III teaches or suggests "total internal reflecting features disposed upon a portion of at least one of the elongate surfaces of said air inlet tube" as claimed. We further determine that the Examiner has improperly relied on impermissible hindsight to conclude that the combination of McGaffigan's reflective elements with the elongate surface of the inlet pipe of Horton, III's UV disinfecting system would have been obvious.

DECISION

We reverse the 35 U.S.C. § 103 rejection of claims 1, 3, and 8-23 as being unpatentable over Horton, III in view of McGaffigan.

We reverse the 35 U.S.C. § 103 rejection of claim 2 is rejected as being unpatentable over Horton, III in view of McGaffigan and Schenck.

We reverse the 35 U.S.C. § 103 rejection of claim 24 as being unpatentable over Horton, III in view of McGaffigan and Scroggins.

ORDER

The Examiner's decision is reversed.

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REVERSED

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