

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NIGEL KEITH HEDGES, JOHN WLLIAM PROCTOR, BRIAN DOMINIC MACCRAITH and HUGH JOSEPH MASTERSON

Appeal 2006-2974
Application 10/110,968
Technology Center 2800

Decided: February 16, 2007

Before JAMES D. THOMAS, JOSEPH F. RUGGIERO, and MAHSHID D. SAADAT, Administrative *Patent Judges*.

SAADAT, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 1-10 and 12-17. Claim 11 has been canceled.

We reverse.

INTRODUCTION

Appellants' invention is directed to a device for measuring color and turbidity of liquid samples using absorbance of visible light and scattering of infrared light by the liquid, respectively. According to Appellants, a main detector placed in a housing provides the measurements for both the turbidity and the color of the liquid sample in a flow through area of the housing. An understanding of the invention can be derived from a reading of exemplary independent claims 1 and 12 which are reproduced as follows:

1. A device for measuring color and turbidity of a liquid sample, said device comprising:
 - | a housing having a flow through sample area at one end thereof through which said liquid sample flows;
 - | an infrared light source mounted to said housing in such a manner as to transmit a beam of infrared light through said sample area;
 - | a main detector mounted to said housing and arranged to measure light scattered off particles suspended in said liquid sample flowing through said sample area, thereby providing a measurement of turbidity of said liquid sample, and
 - | a visible light source mounted to said housing in such a manner as to transmit a beam of light through said sample area, said main detector being further arranged to measure light transmitted from said visible light source through said liquid sample flowing through said sample area thereby providing a measure of color of said liquid sample.

12. A device for measuring first and second physical properties of a fluid sample, said device comprising:

- a housing having at one end thereof a sample area accommodating a fluid flow therein;
- a first light source mounted to said housing, and positioned to transmit a first light beam through said fluid flow in said sample area, along a first propagation axis;
- a second light source mounted to said housing, and positioned to transmit a second light beam through said fluid flow in said sample area, along a second propagation axis which is substantially perpendicular to said first axis;
- a main detector mounted to said housing and positioned along said first axis to receive both light transmitted from said first light source and light scattered from said second light source; and
- means for alternately energizing said first and second light sources.

The Examiner relies on the following references in rejecting the claims:

Harjunmaa	US 4,555,178	Nov. 26, 1985
Taylor	US 5,828,458	Oct. 27, 1998
Paoli	US 5,872,361	Feb. 16, 1999
Baker	GB 2 234 061 A	Jan. 23, 1991

Appellants' Admitted Prior Art (AAPA), Page 8, lines 16-20 of the Specification.

The rejections as presented by the Examiner are as follows:

1. Claims 1-5, 8, and 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Harjunmaa, Paoli, and Baker.
2. Claims 6 and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Harjunmaa, Paoli, Baker, and Taylor.
3. Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Harjunmaa, Paoli, Baker, and AAPA.

4. Claims 12-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Harjunmaa and Paoli.

5. Claim 17 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Harjunmaa, Paoli, and Baker.

We make reference to the Briefs and the Answer for the respective positions of Appellant and the Examiner.

OPINION

With respect to the rejection of claims 1-5, 8, 10, and 17, the focus of Appellants' arguments is that Harjunmaa uses a differential technique and would not measure both color and turbidity because of the need for the absolute absorbencies to calculate concentrations in a mixture (Br. 17).

Appellants further argue that the claimed main detector for measuring both the infrared light scattered from the particles suspended in the liquid and the visible light transmitted through the liquid are not taught or suggested by the combination of the references (Br. 21-22). Appellants assert that while Baker measures different absorbencies of light from two different sources, the optics are mounted based on a common geometry (Br. 22).

The Examiner responds by stating that Harjunmaa measures the turbidity of a sample relative to a reference sample which leads to determining the absolute measurement for the first sample (Answer 13-14). The Examiner further argues that based on the teachings of Baker with respect to using infrared and visible light sources for measuring both color and turbidity of the sample, it would have been obvious to provide both types of light sources in Harjunmaa for measuring the corresponding properties of the liquid sample (Answer 14).

As a general proposition, in rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. *See In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993) and *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). A prima facie case of obviousness is established when the teachings of the prior art itself would appear to have suggested the claimed subject matter to one of ordinary skill in the art. *See In re Bell*, 991 F.2d 781, 783, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993); *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988); *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985). In considering the question of the obviousness of the claimed invention in view of the prior art relied upon, the Examiner is expected to make the factual determination set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. *See also In re Rouffet*, 149 F.3d 1350, 1355, 47 USPQ2d 1453, 1456 (Fed. Cir. 1998). Such evidence is required in order to establish a prima facie case. *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984).

Contrary to the Examiner's assertion, Harjunmaa does not obtain absolute measurements of turbidity and/or color and instead, measures the differences in the optical properties of two samples (Abstract, ll. 1-5) when the same type of light is directed from two sources (Harjunmaa, col. 2, ll. 28-31). We also disagree with the Examiner (Answer 14) that Baker would

have suggested to one of ordinary skill in the art measuring two different properties using the single detector of Harjunmaa. The reason Harjunmaa uses one detector is the differential nature of the measurement for one property at a time using one type of light without allowing for different properties to be measured by the main detector simultaneously.

An obviousness analysis commences with a review and consideration of all the pertinent evidence and arguments. In reviewing the Examiner's decision on appeal, the Board must necessarily weigh all of the evidence and argument. *See In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). In this case, as discussed by Appellants (Br. 13-17, 34-35), using a main detector for measuring both infrared and visible light responses is neither taught by Harjunmaa, nor suggested by Baker's use of a specific geometry using separate detectors (Br. 22). In fact, in terms of using a single detector, since Baker provides for visible and infrared light to measure turbidity and color respective, there remains no need for modifying the differential method of measurement of Harjunmaa using two samples and one type of light source.

In view of our analysis above, we find that the Examiner has failed to set forth a *prima facie* case of obviousness because the necessary teachings and suggestions related to the claimed infrared and visible light measurements by the main detector, as recited in independent claim 1, are not shown. Accordingly, based on the weight of the evidence and the arguments presented by the Examiner and Appellants, we do not sustain the 35 U.S.C. § 103 rejection of claims 1-5, 8, and 10 over the combination of Harjunmaa, Paoli, and Baker.

With respect to the rejection of claims 6, 7, and 9, we note that the Examiner further relies on Taylor and AAPA for the additional features recited in the these dependent claims. However, the Examiner has not pointed to any additional teachings or convincing rationale in modifying the combination of Harjunmaa, Paoli, and Baker with the teachings of these references that would have overcome the deficiencies of the applied prior art as discussed above with respect to claim 1. Accordingly, we do not sustain the 35 U.S.C. § 103 rejection of claims 6 and 7 over Harjunmaa, Paoli, and Baker in combination with Taylor, nor of claim 9 over Harjunmaa, Paoli, and Baker in combination with AAPA.

Turning now to the 35 U.S.C. § 103 rejection of claims 12-16, we observe that the claims require a second light source transmitting light through the fluid sample along an axis which is substantially perpendicular to the axis of a first light beam through the sample for measuring first and second physical properties of the fluid sample. Apparently, the Examiner takes the position that the light beam paths depicted in Figure 2 of Harjunmaa disclose the claimed light beams having a mutually perpendicular axis (Answer 11). We disagree. The multiple light beams illuminating the samples in Harjunmaa, not only are from the same type of light source, but also illuminate two samples or two areas of the same samples for a differential measurement (Col. 2, ll. 23-25) such that LED light beams 3 and 4 are incident in a perpendicular axis with respect to the sample and the other two, 5 and 6, form an oblique axis (Col. 2, ll. 26-31). However, Harjunmaa energizes LED's 3 and 6 in parallel and LED's 4 and 5 in parallel, which by no means form a perpendicular axis in their energized

pairs. We also disagree with the Examiner (Answer 22) that the way the light beam incident on the detector forms a right angle with the main light beam incident on the samples teaches the claimed perpendicular axis of the first and the second light beams. In Figure 2, Harjunmaa uses a mirror to deflect *both* light beams incident on *both* samples to the detector which, contrary to the Examiner's position (*id.*), results in the first and the second beams having the same axis before and after they are deflected by the mirror. Paoli, as discussed above with respect to claim 1, includes no teaching or suggestion for modifying the differential measurement of Harjunmaa to measure first and second properties using perpendicular light beams from first and second light sources. Therefore, the Examiner has failed to set forth a *prima facie* case of obviousness and the 35 U.S.C. § 103 rejection of claims 12-16 over Harjunmaa and Paoli cannot be sustained.

Turning finally to the rejection of claim 17, we note that Baker adds nothing to cure the deficiencies of the combination of Harjunmaa and Paoli, as discussed above with respect to claim 1. Accordingly, we do not sustain the 35 U.S.C. § 103 rejection of claim 17 over Harjunmaa, Paoli, and Baker.

CONCLUSION

In view of the foregoing, the decision of the Examiner rejecting claims 1-17 under 35 U.S.C. § 103 is reversed.

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REVERSED

ED/GW

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