The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 33

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GUENTER ABERSFELDER, HELMUT GRANTZ, THORSTEINN HALLDORSSON, HORST SCHMIDT-BISCHOFFSHAUSEN, STEFAN UHL, and HEINRICH ALEXANDER EBERL

Appeal No. 2002-1849
Application No. 09/116,710

HEARD: April 16, 2003

Before JERRY SMITH, LEVY, and BLANKENSHIP, Administrative Patent Judges.

LEVY, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 2-13, which are all of the claims pending in this application. Claim 1 has been canceled.

BACKGROUND

Appellants' invention relates to the use of a holographic video screen as a display surface for information systems. An understanding of the invention can be derived from a reading of exemplary claim 2, which is reproduced as follows:

2. Method of displaying information, comprising:

providing an output from an information system to a holographic image generation unit; and

displaying information contained in said output in the form of a hologram by generating holographic image in a holographic screen;

wherein a property of a surface of the holographic screen is that it has an intrinsic coloration which is one of black, gray and a dark color in ambient light.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Brown et al. (Brown)	4,376,950	Mar. 15, 1983
Abileah et al. (Abileah)	5,629,784	May 13, 1997
Branca, Jr. et al. (Branca)	6,122,079	Sep. 19, 2000 (filed Feb. 28, 1997)

Claims 2-13 stand rejected under 35 U.S.C. § 103 as being unpatentable over Brown in view of Abileah and Branca.

Rather than reiterate the conflicting viewpoints advanced by the examiner and appellants regarding the above-noted rejection, we make reference to the examiner's answer (Paper No. 28, mailed April 22, 2002) for the examiner's complete reasoning in support of the rejection, and to appellants' brief (Paper No. 27, filed February 4, 2002) for appellants' arguments thereagainst. Only

those arguments actually made by appellants have been considered in this decision. Arguments which appellants could have made but chose not to make in the brief have not been considered. See 37 CFR 1.192(a).

OPINION

In reaching our decision in this appeal, we have carefully considered the subject matter on appeal, the rejection advanced by the examiner, and the evidence of obviousness relied upon by the examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, appellants' arguments set forth in the brief along with the examiner's rationale in support of the rejection and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would not have suggested to one of ordinary skill in the art the invention as set forth in claims 2-13. Accordingly, we reverse, essentially for the reasons set forth by appellants.

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, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations 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. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. 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); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole. See id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745

F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

We consider first the rejection of claim 2 based on the teachings of Brown considered with Abileah and Branca. The examiner's position (answer, page 4) is that Brown is silent as to the coloration of a surface of the holographic screen in ambient light being black, gray, or a dark color. To overcome this deficiency in Brown, the examiner turns to figure 4 and col. 9, lines 10-35 of Abileah for a teaching of a holographic display that appears as one of black, gray, and a dark color in ambient light (col. 9, lines 10-35). The examiner asserts (answer, page 5) that "the darken[ed] display is considered [to be] a dark color in the off state." The examiner adds (id.) that:

> It is further noted that although the combination of Brown and Abileah et al discloses performing holographic image generation on a display, it is silent about using the holographic screen wherein a property of a surface of the holographic screen is that it has an intrinsic coloration which is one of black, gray and a dark color in ambient light as specified in claims 2-5 and 8-10.

To overcome this deficiency of Brown and Abileah, the examiner turns to Branca for a teaching of a property of a holographic screen that has an intrinsic coloration which is one of black, gray and a dark color in ambient light.

Appellants assert (brief, page 6) that Abileah does not involve the formation of a holographic image or a hologram in a holographic screen, but rather relates to a liquid crystal display. Appellant acknowledges that Abileah discloses a holographic diffuser, but argues (brief, page 7) that Abileah has no disclosure of a holographic screen for display of a holographic image.

From our review of Abileah, we find that Abileah is directed to a liquid crystal display having an enlarged viewing zone (col. 1, lines 5 and 6). Abileah discloses (col. 2, lines 37-41) that it is desirable to have an LCD reflect as little ambient light as possible. In addition,(col. 8, line 56 through col. 9, line 35) the normally white and normally black displays of Abileah, referred to by the examiner, result from a change in orientation of the transmission axes of polarizers 3 and 15, and do not relate to an intrinsic surface coloration of the holographic screen. The optional holographic diffuser 21, like facets 19 of optical film 17 of Abileah, act to diffuse or spread the image of the liquid crystal display in a large number of directions, as the image is reflected from light scattering or roughened surface 133 of diffuser 21, so that the sharp images of the display are clearly viewable over a wide range of horizontal and vertical

viewing directions (col. 10, line 54 through col. 11, line 3, and col. 13, lines 12-24). It is further disclosed (col. 13, lines 25-31) that:

> With respect to ambient light, optional diffuser acts to disperse the incoming ambient rays which are thereafter substantially collimated by faceted film 17. The substantial collimation of the ambient light allows it to proceed directly (i.e., not at an angle) into the LC cell. This is believed to reduce the amount of ambient reflection off of the display panel.

Abileah further discloses (col. 13, lines 45-49) that the provision of the diffuser 21 allows the viewing envelope or zone of the display to be enlarged in both the horizontal and vertical viewing angle directions.

From these teachings of Abileah, we find that Abileah discloses (col. 14, lines 16-18) providing an anti-reflective coating 35 on the exterior roughened surface of diffuser 21 to decrease the ambient light reflection from the display panel. However, Abileah is silent as to the intrinsic coloration of the anti-reflective film or coating 35. We would have to resort to speculation to find that Abileah suggests that the surface of the display has an intrinsic surface coloration of black, grey or a dark color, as required by claim 2.

In any event, the examiner acknowledges (answer, page 8) that Abileah is silent about the intrinsic surface coloration as

specified [in the claims], and asserts (id.) that Branca was introduced to show the particular feature of intrinsic surface coloration. The examiner asserts (answer, page 5) that Branca teaches the use of a holographic screen wherein a property of a surface of the holographic screen is that it has an intrinsic coloration which is one of black, grey and a dark color. The examiner points to col. 3, lines 20-31, lines 40-44, col. 9, lines 26-30 and 38-48, and col. 2, lines 37-46.

Appellants assert (brief, pages 8 and 9) that Branca is directed to a color compensation arrangement which compensates for the fact that polarizers used in the display create a distinctly perceptible hue, for example "bluish", "redish", etc, and that Branca provides a chromatically adjusted display which is diffusely illuminated by and viewable under ambient light. It is argued (id.) that Branca provides a liquid crystal display, not a holographic display, and does not teach or suggest the use of a holographic screen which is black, grey or a dark color in ambient light. It is further argued (brief, page 9) that the purpose of the holographic diffuser element in Branca is to achieve uniformity of illumination, and that Branca discloses the use of reflective pigments into light reflective layer 110 which is applied to the holographic transmission diffuser.

From our review of Branca, we find that Branca is directed to a chromatically-adjusted, holographically illuminated image-providing display element, including a reflective holographic diffuser, and color compensation means for effecting substantially achromatic illumination (col. 1, lines 1-14). Branca discloses that in conventional devices using LCD displays, backlighting and edge-lighting are oftentimes the greatest source of power drain. To reduce energy requirements, conventional reflectors have been replaced with reflective holographic diffusers, that are comprised of a holographic transmission diffuser and a reflection layer. In applications where good achromaticity is of heightened importance, the illumination effected by the diffuser is limited by the intrinsic color of the polarizers incorporated into the display. Branca adds that perfectly neutral polarizers are uncommon and that more typically, a synthetic sheet polarizer will have an intrinsic perceptible hue, i.e., "bluish" or "reddish" (col. col. 2, lines 14-43). As a result, despite the use of a reflective holographic diffuser to effect an achromic spectral output, transit of ambient illumination through the liquid crystal element will result in tainting the light perceived by a viewer (col. 2, lines 44-47). To meet this need, Branca discloses providing additives

or layers into the LCD to compensate for the color tainting, such that the overall background illumination is perceptually achromatic (col. 2, lines 54-60). It is a principal object of the invention (col. 3, lines 41-44) to provide:

> a chromatically-adjusted holographically-illuminated display viewable under ambient light without requirement of a supplemental internal light source, thereby reducing bulk and power requirements.

As shown in figure 1, display 10 is chromatically adjusted and comprises at least an image providing display element 200 and a reflective holographic diffuser 100 (col. 4, lines 36-40).

Coloring material is added in quantities or densities sufficient to effect the output of the display toward substantial achromaticity (col. 5, lines 40-43). While the coloring material can be added to the LCD stack 200 or to reflective holographic diffuser 100, the coloring material is more easily incorporated into a color compensatory light filter layer 300 (figure 1, and col. 5, lines 47-51). Branca further discloses that although the invention is not limited to any particular display format, that the display is configured as a reflectively viewable LCD col. 6, lines 55-58). Holographic diffuser 100 comprises a light reflective layer 110 deposited onto holographic transmission diffuser 100. A reflective holographic diffuser is accomplished

by direct deposition of a light reflective layer on an embossed hologram (col. 9, lines 14-17). Light reflective layer 110, typically a metallic foil, may be a mirror, such as silvered glass, glass with a conventional grey filter, polystyrene of grey or silver hue, or polypropylene (col. 9, lines 24-29). Reflective pigments for the light reflective layer 110 may be highly reflective metallic pigments, or can be less reflective pigments (col. 9, lines 33-39).

To provide the holographic transmission diffuser, an object or surface thereof is holographically recorded in a holographic medium as an interference pattern. A volume transmission hologram will be produced having holographically recorded therein the desired optical properties of the light diffusing object (col. 10, lines 36-39). The production of original volume phase transmission holograms may be inconsistent with desirable product process times. Accordingly, an original hologram may be used as a master for the mass production of several duplicate holograms (col. 12, lines 25-29). It is not required that the transmission holographic diffuser 120 be prepared as a transmission hologram. Transmission holographic diffuser 120 may also be prepared as a light transmissive layer having a holographically produced "surface relief pattern" (col. 12, lines 32-36). When backed

with a reflective film, the resultant embossed display hologram may be deposited onto the LCD element in the same manner as the reflective volume phase transmission hologram (col. 12, lines 37-41). Branca further recites that for purposes of the present invention, the embossed hologram is construed as the holographic transmission diffuser (col. 13, lines 1-5). In addition, Branca further discloses that for the purposes of the present invention, the highly reflective metal coating is construed as the light reflective layer 110 (col. 13, lines 8-11).

From the disclosure of Branca, we find that Branca is silent as to the intrinsic color, in ambient light, of polarizing layer 22a, which is on the front surface of the LCD stack 200. In addition, we find that although Branca discloses that light reflective coating 110 may be made of grey polystyrene, we note that layer 110 is located on the back of holographic transmission diffuser 120, which is behind the LCD stack, and reflects light back through the holographic diffuser 120, and through the LCD stack. While we consider the layer 110 to be intrinsically gray in coloration, independent claim 2 requires that the black, grey or dark color is on a surface of the screen. Layer 110 is a reflective layer formed on the back of diffuser 120 and is not on a surface of the LCD screen. In addition, although Branca uses

an embossed hologram as the holographic diffuser to holographically illuminate the image, we agree with appellants (brief, page 8) that Branca does not disclose the display of a holographic image on a holographic screen. Note that we construe the "surface" of the screen to be the front surface of the screen viewed by an observer.

We are not persuaded by the examiner's assertion (answer, page 9) that Branca (col. 3, lines 20-54) clearly shows the property of "an intrinsic coloration which is one of black, grey and a dark color." We find that the passage referred to by the examiner refers to countering the effects of color tainting by incorporating coloring materials, which with the reflective holographic diffuser, results in the image being perceived by a user as substantially achromatic illumination. The passage additionally discloses, inter alia, that the combined application of a reflective holographic diffuser and the coloring material can achieve similar utility in virtually any image-providing display, and that the invention provides a chromatically-adjusted, holographically illuminated display viewable under ambient light without the requirement of a supplemental internal light. Thus, we find no teaching or disclosure for the limitation of an intrinsic coloration which is one of black, grey

or a dark color. Nor are we persuaded by the examiner's assertion, (answer, pages 9 and 10) that the chromatic adjustment of Branca is directed to a hue that is "non-white" and that the "non-white" can be considered to be the "dark color" referred to in the claims. Firstly, the "non-white" color referred to by Branca is referring to the color of the image tainted by the polarizers, without correction by the coloring elements (pigments) and the holographic diffuser. Secondly, the color referred to is not the intrinsic coloration of the screen of the LCD display. Thirdly, the fact that the color is "non-white" does not make the color "black, grey or a dark color as recited in appellants' claim 2.

From all of the above, we find that the examiner has failed to establish a prima facie case of obviousness of the invention set forth in claim 2. Accordingly, the rejection of independent claim 2 under 35 U.S.C. § 103(a) is reversed. Independent claim 9 identically recites "a property of a surface of the holographic screen is that it has an intrinsic coloration that is one of black, grey and a dark color in ambient light." Therefore, the rejection of claim 9, as well as dependent claims 3-8 and 10-13 under 35 U.S.C. § 103(a) is reversed.

CONCLUSION

To summarize, the decision of the examiner to reject claims 2-13 under 35 U.S.C. § 103(a) is reversed.

REVERSED

JERRY SMITH Administrative Patent Judge	)	
STUART S. LEVY Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
HOWARD B. BLANKENSHIP Administrative Patent Judge	)	

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