THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 14

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRIAN E. AUFDERHEIDE
and
MICHAEL J. ROBRECHT

Appeal No. 96-1249
Application 08/270,215[1]

ON BRIEF

Before HAIRSTON, MARTIN, and BARRETT, Administrative Patent Judges.

MARTIN, Administrative Patent Judge.

DECISION ON APPEAL

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[1] Application for patent filed July 1, 1994. The front of the file wrapper identifies this application as a continuation of Application Serial No. 07/984,057, filed November 30, 1992.

This is an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 19-35, all of the pending claims, under 35 U.S.C. § 103. We reverse.

The invention

The invention is an improved analog touch screen. Appellants' Figures 1-3 show a prior art analog touch screen including a top transparent layer 11 disposed over a bottom transparent layer 12 (Spec. at 5, lines 22 to 24). As depicted in Figures 2 and 3, in operation the top layer 11 acts as a resistive layer running in the vertical direction between upper and lower bus bars 15 and 16, while the bottom layer acts as a resistive layer running in the horizontal direction between right-side and left-side bus bars 13 and 14 (Spec. at 5, line 24 to p. 6, line 3). As shown in Figure 4, when a voltage V_{IN} is applied via bus bars 13 and 14 across the bottom layer 12 and when top layer 11 is depressed to make contact with bottom layer 12, a voltage V_{OUT} appears on the top layer, which is left floating during this measurement, representing the horizontal location of the contact point (Spec. at 6, lines 10-26). The vertical location of the contact point is determined in the same way, i.e., by applying voltage V_{IN} across top layer 11 and measuring the voltage V_{OUT} on the bottom layer, which is left floating for this measurement (Spec. at 6, lines 26-30). When the resistive transparent layers are formed of indium tin oxide (ITO) or tin oxide, which are semiconductive ceramic materials, the electrical contact resistance has been observed to increase significantly after many cycles of operation (i.e., switch closures), which can cause problems with switch reliability (Spec. at 2, lines 2-15).

Referring to Figure 5, appellants solve this problem by applying a thin noncontinuous palladium film (26, 27) to the contact surfaces of one or both of ITO layers 22 and 24 (Spec. at 8, lines 10-17). The palladium films may be in the range of about 5D to about 70D thick, preferably from about 10D to about 30D (id.). "At this thickness, the metal film probably forms islands 27a, as shown in Figs. 6 and 7, rather than a continuous film. Therefore, sheet resistance is still controlled by the ITO layers 22, 24." (Spec. at 8, lines 17-20.) The "about 5D to about 70D" range is recited in dependent claim 22 and the "about 10D to about 30D" range is recited in dependent claim 23.

We note that because all of the appealed claims are directed to an analog touch screen, they do not encompass the matrix touch screen shown in appellants' Figure 8, which does not use resistance measurements to determine the contact point, as does an analog touch screen. Instead, it employs (a) a first plurality of transparent ITO top conductors 31 running in the vertical direction, each having a respective bus bar 33 and trace 35 and (b) a second plurality of transparent ITO bottom conductors 32 running in the horizontal direction, each having a respective bus bar 34 and trace 36 (Spec. at 10, lines 15-21).
When the top layer is depressed, suitable known coding circuitry examines the traces to determine which top conductor is making contact with which bottom conductor (Spec. at 10, line 24 to p. 11, line 2).

The claims

Claim 19, the sole independent claim, reads as follows:

19. An analog touch screen, comprising:

a top transparent layer disposed over a bottom transparent layer, the top layer comprising a flexible sheet having a layer of a semiconductive ceramic coated on a lower face thereof, and the bottom transparent layer comprising a substrate sheet having a thin layer of a semiconductive ceramic coated on an upper face thereof;

a non-electrically conductive spacer interposed between the top and bottom layers effective for spacing apart the layers of semiconductive ceramic except when the top layer is flexed by an external touch so that electrical contact occurs between the semiconductive layers at a location where the touch occurred;

a noncontinuous, electrically conductive metallic film which in use does not form an appreciable amount of an insulating oxide, the film covering at least one of the layers of semiconductive ceramic so that the film is interposed between the semiconductive layers during electrical contact caused by a touch, the metallic film being of a thickness effective to reduce the effects of repeated operation on contact resistance over many operating cycles of the touch screen without substantially varying the sheet resistance of the underlying semiconductive ceramic layer; and

conductors connected to the transparent layers for applying an electrical current to the semiconductive layers to determine the horizontal and vertical position of the external touch on the top layer.

The references

The examiner relies on the following references:

Kuhlman	4,786,767	Nov. 22, 1988
Olson	4,958,148	Sep. 18, 1990
Mikoshiba et al. (Mikoshiba)	5,225,273	July 6, 1993

The rejection

Claims 19-35 stand rejected under 35 U.S.C. § 103 as unpatentable over Kuhlman in view of Mikoshiba and Olson. Appellants have submitted rebuttal evidence in the form of a 37 CFR § 1.132 declaration.

The PTO has the burden under section 103 to establish a prima facie case of obviousness. In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art that would lead that individual to combine the relevant teachings of the references. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598-99 (Fed. Cir. 1988). After a prima facie case of obviousness has been established, the burden of going forward shifts to the applicant to show facts supporting the opposite conclusion. Piasecki, 745 F.2d at 1472, 223 USPQ at 788 (citing In re Heldt, 433 F.2d 808, 811, 167 USPQ 676, 678 (CCPA 1970)).

The examiner relies on the Kuhlman patent (se Fig. 1) for its disclosure of a touch panel which employs an outer sheet 11 separated by spacers 14 from an inner sheet 12 (col. 3, lines 33-35), wherein each sheet can include a plastic substrate (17 or 31) and a single layer of ITO (20 or 32) (col. 4, line 19 to col. 5, line 6). While, as shown in Figures 2 and 3, each of conductive layers 20 and 32 can alternatively be formed as a metal layer (22 or 35) sandwiched between dielectric layers (21 and 24, or 34 and 36) (col. 4, lines 39-52; col. 5, lines 5-18), Kuhlman does not disclose forming a metal layer on the outside, contact surface of either conductive layer.

The Mikoshiba patent discloses examples of a "transparent electroconductive laminate" that is suitable "as an electrode for a transparent touch panel and an electroluminescent panel" and various other applications (col. 12, lines 3-10). The "transparent electroconductive laminate" includes at least a substrate in the form of a sheet of organic polymer (col. 4, lines 50-67) and a transparent electroconductive layer, such as indium oxide (col. 5, lines 50-56). The laminate may also include, between the substrate and the indium oxide layer, an adhesion-improving polymeric layer which is formed by hydrolysis of a organosilicic compound and which may contain fine particles of a metal or metal compound (col. 6, line 42 to col. 7, line 6). A layer of palladium can be deposited directly on the transparent electroconductive layer (e.g., an indium oxide layer) in order to prevent "degradation" thereof:

> The transparent electroconductive laminate according to the present invention can be coated with a thin layer of at least one of metal and/or metal oxide selected from a group consisting of palladium, platinum, ruthenium, osmium, iridium, rhodium, gold, cobalt, silver, nickel, tungsten, iron and tin either on the above-mentioned transparent electroconductive layer directly or on the above-mentioned polymeric layer containing the fine particles. The thin layer of at least one metal and/or metal oxide selected from the group consisting of platinum, palladium, ruthenium, osmium, iridium and rhodium is more preferable. The metal and/or metal oxide can be used singly or as a mixture. The metal and/or metal oxide layer can also be used as a laminated structure.
>
> The thickness of the metal and/or metal oxide layer is preferably more than 0.5 D and less than 20 D. <u>A thickness of less than 0.5 D is not effective in preventing degradation of the transparent electroconductive layer</u>. On the other hand, a thickness of more than 20 D is not preferable since the transparency is decreased. [Our emphasis.] [Col. 9, lines 7-27.]

Although Mikoshiba does not state that the foregoing teaching of depositing a metal and/or metal oxide layer on the transparent electroconductive layer is limited to laminates for use in electroluminescent displays, we agree with appellants that this is implied by the discussion of Examples 10-23 (col. 16, line 44 to col. 17, line 41), which are only examples employing such metal and/or metal oxide layers. In each of those examples, "a hardened layer of the organosilicic compound was formed on the both sides of the surface of a 75 Fm thick polyethylene terephthalate film and then an indium@tin oxide layer with a thickness of 250 D was deposited on one surface of the hardened organosilicic compound layer" (col. 16, lines 44-51). Next, using a different metal or alloy for each example (see col. 17, Table 6), a layer of the metal or metal alloy about 2 D thick was formed on the indium@tin oxide layer, coated with the coating liquid used in Example 5, and then heated in order to produce a transparent electroconductive laminate (col. 16, lines 52-63). This transparent electroconductive laminate was then laminated to the emitting layer of a test sheet of the type described in Example 4, which is an aluminum sheet coated with insulating layer and a coating containing phosphor powder (col. 13, line 58 to col. 14, line 13), to form a sample for a degradation test (col. 16, lines 64-68). After the attachment of suitable electrodes and power terminals, "[a]n electrical power of 100

V, 400 Hz was applied to both terminals and lighting [i.e., light emission by the phosphor] was continued for 15 hours in an atmosphere at 60EC and 90% RH," after which "[d]egradation of the transparent electroconductive layer (discoloration) was then checked" (col. 17, lines 1-14). The results, shown in Table 6, reveal that some of the examples, including the palladium example (Example 10), experienced no discoloration of the transparent electroconductive layer, while the remaining examples experienced only slight discoloration (col. 17, lines 21-41).

We agree with appellants (Brief at 7-9) that the artisan would have understood Mikoshiba as a whole to be teaching that a metal or metal oxide film can be used to prevent the transparent electroconductive layer from being degraded by the conditions encountered in an electroluminescent display, wherein the transparent electroconductive layer is used to apply a 100-volt, 400 Hz current to a phosphor layer. We also agree that the artisan would not have expected these or similar conditions to be encountered in a transparent touch panel and thus would not have understood Mikoshiba to be suggesting the use of a metal or metal oxide layer for that purpose in a transparent electroconductive laminate used in a touch panel.

Furthermore, even assuming for the sake of argument that Mikoshiba would have been understood as teaching the use of a metal or metal oxide layer in a transparent electroconductive laminate in a touch panel, it would have been considered applicable to a matrix touch panel rather than to an analog touch panel. The reason is that Mikoshiba does not describe the metal or metal oxide layer as being noncontinuous, as it must be to avoid interfering with the resistance function provided by the transparent semiconductive layer in an analog touch panel, a function not provided by the transparent semiconductive layer in a matrix touch panel. The examiner's contention (Answer at 4) that Mikoshiba's metal layer, which is disclosed as having a thickness in the range of more than 0.5 D and less than 20 D (col. 9, lines 23-24), is a non-continuous film appears to be based on the fact that this range falls within appellants' disclosed thickness range of 5 D to 70 D, which is described as forming islands rather than a continuous film (Spec. at 8, lines 10-12). However, it is not permissible to use appellants' own disclosure to prove an artisan would have recognized that Mikoshiba's metal or metal oxide layer inherently is discontinuous, and motivation cannot be based on an inherent property that was not recognized in the art. See In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993):

> "That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown." In re Spormann, 363 F.2d 444, 448, 150 USPQ 449, 452 (CCPA 1966). Such a retrospective view of inherency is not a substitute for some teaching or suggestion supporting an obviousness rejection. See In re Newell, 891 F.2d 899, 901, 13 USPQ2d 1248, 1250 (Fed.Cir.1989).

Nor is adequate motivation provided by the Olson patent, which the examiner, citing Olson's description of analog and matrix touch screens at column 1, lines 18-35 (Answer at 4), argues "teaches the interchangeability of the two types of touch screen" (Answer at 7). For the reasons already discussed, these two screen types are not interchangeable insofar as adding Mikoshiba's continuous metal or metal oxide layer to the contact surface of an electroconductive layer is concerned. That is, adding a continuous metal or metal oxide layer to the contact surface of the electroconductive layer in a analog screen will interfere with the resistive function of that layer.

Because for the foregoing reasons, the examiner has failed to meet his initial burden to establish a prima facie case of obviousness, we need not consider appellants' 37 CFR § 1.132 declaration, which is offered as rebuttal evidence.

The § 103 rejection of claim 19 and its dependent claims 20-35 for unpatentability over Kuhlman in view of Mikoshiba and Olson is reversed.

REVERSED

KENNETH W. HAIRSTON Administrative Patent Judge	BOARD OF PATENT
JOHN C. MARTIN Administrative Patent Judge	APPEALS AND
LEE E. BARRETT Administrative Patent Judge	INTERFERENCES

JCM/cam

cc:

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