UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte XIANG-DONG MI and STANLEY W. STEPHENSON

Appeal 2008-2577
Application 10/426,539
Technology Center 2600

Decided: September 23, 2008

Before JOSEPH F. RUGGIERO, ROBERT E. NAPPI,
and KARL D. EASTHOM, *Administrative Patent Judges.*

NAPPI, *Administrative Patent Judge.*

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 6(b) of the final rejection of claims 1, 3 through 12, and 14 through 22.

We affirm the Examiner's rejections of these claims.

INVENTION

The invention is directed towards a liquid crystal display which includes a patterned conductor. The patterned conductor has electrically separate areas defining segments of the display and a background of the

display, thus the display can be driven in a positive or negative mode. See pages 2 and 3 of Appellants' Specification. Claim 1 is representative of the invention and reproduced below:

> 1. A display having a display area capable of displaying a plurality of characters in a background, the characters including a plurality of segments, comprising:
>
> a) a first patterned conductor layer having electrically separate areas defining character regions, the first patterned conductor being substantially coextensive with the display area;
>
> b) a first plurality of contacts for making electrical contact to each of the character regions in the first patterned conductor layer;
>
> c) a layer of light modulating material located over the first patterned conductor layer, wherein the light modulating layer comprises a cholesteric liquid crystal material;
>
> d) a second patterned conductor layer located over the layer of light modulating material and having electrically separate areas defining the segments of the characters and the background, the second patterned conductor being substantially coextensive with the display area;
>
> e) a dielectric layer located over the second patterned conductor layer, the dielectric layer defining holes over each segment and the background area of the second patterned conductor layer;
>
> f) a third patterned conductor layer located over the dielectric layer defining a plurality of conductors connected to the areas defining the character segments in the second patterned conductor and the background area through the holes in the dielectric layer; at least one of the conductors being connected to a segment in more than one character; and
>
> g) a second plurality of contacts for making electrical contact with the conductors in the third patterned conductor layer, whereby the display may be addressed in a passive matrix fashion by electrically addressing the first and second plurality of contacts, and may be driven in a positive or negative mode.

REFERENCES

Parker	US 4,922,242	May 1, 1990
Petruchik	US 6,323,928 B1	Nov. 27, 2001
Sekiguchi	US 6,774,970 B1	Aug. 10, 2004

REJECTION AT ISSUE

Claims 1, 3, 4, 6 through 12, 14, 15, and 17 through 22, stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Petruchik in view of Sekiguchi. The Examiner's rejection is on pages 3 through 5 of the Answer.

Claims 5 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Petruchik in view of Sekiguchi and Parker. The Examiner's rejection is on page 5 of the Answer.

Throughout the opinion, we make reference to the Brief (received January 8, 2007) and the Answer (mailed May 9, 2007) for the respective details thereof.

ISSUES

Appellants argue on pages 3 through 10 of the Brief that the Examiner's rejection of claims 1, 3, 4, 6 through 12, 14, 15, and 17 through 22 is in error. Appellants assert that Petruchik does not teach a second patterned conductor layer having electrically separate background areas where the background and the segments are separately switchable to allow the display to be driven in a positive or negative mode as claimed. Br. 4 and 5. Further, Appellants state that Sekiguchi does not teach a passive matrix display that has a cholesteric liquid. Br 6. Appellants argue that the Examiner has not established that one skilled in the art would be motivated to combine Petruchik and Sekiguchi and that there is a reasonable

expectation of success. Br. 7 through 10. Further, on page 8 of the Brief, Appellants argue that "[a]lthough Petruchik and Sekiguchi disclose holes, the references fail to disclose or suggest holes over both the segment and the background and respective conductive connection through the holes to both segment as well as background."

Thus, Appellants' contentions with respect to the rejection of claims 1, 3, 4, 6 through 12, 14, 15, and 17 through and 22 present us with three issues. The first issue is whether the Examiner erred in combining the teachings of Petruchik and Sekiguchi. The second issue is whether the Examiner erred in finding that that the combined teachings of Petruchik and Sekiguchi teach a passive matrix display with a conductive layer having electrically separate areas for segments of characters and a background, where the display may be driven in positive or negative mode. The third issue is whether the Examiner erred in finding that the combination of the references teaches holes in the dielectric layer over both the segment conductors and the background conductors as claimed in claim 1.

Appellants argue on pages 10 through 12 of the Brief, that the Examiner's rejection of claims 5 and 16 is in error. Appellants' arguments directed to the rejection of these claims are directed to the combination of Petruchik and Sekiguchi and do not raise any issues in addition to those presented with respect to the rejection of claim 1. Thus, Appellants' contentions with respect to the rejection of claims 5 and 16 present us with the same issues as the rejection of claim 1.

PRINCIPLES OF LAW

On the issue of obviousness, the Supreme Court has recently stated that "the obviousness analysis cannot be confined by a formalistic

conception of the words teaching, suggestion, and motivation." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007). Further, the Court stated "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1739 (2007).

> When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. . . . [A] court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

Id. at 1740. "One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent's claims." *Id.* at 1742.

FINDINGS OF FACT

1. Petruchik teaches a method of forming a display by forming transparent electrically conductive layers and liquid crystal layers on a transparent substrate. Abstract.
2. Petruchik's display includes a substrate, item 12, with a first clear electrically conductive layer (item 13) over the substrate (item 12). Col. 3, ll. 44-55.

3. The first electrically conductive layer has a light modulating layer (item 30) overlaying it. The light modulating layer can be a cholesteric liquid crystal, or other electrically modulated materials. Petruchik col. 3, ll. 57-60 and col. 4, ll. 1-4.
4. Color conductive segments (items 16) are placed over the light modulating layer. The color conductive segments drive the light modulating layer to either a dark state (light absorbing state) or a light state (light reflecting state). Petruchik col. 6, ll. 40-45.
5. The shape of the elements of the color conductive elements form segments of a display. See, Petruchik Figures 9A-C, and 10.
6. Overlaying the color conductive segments is a dielectric layer (item 80) that has a conductive layer above it that provides traces for connection to the color conductive layer. The traces make electrical contact with the color conductive segments via holes (items 82) in the dielectric layer. Petruchik col. 7, ll. 24-31, and figure 10.
7. The patterns of the color conductive segments, identified in Petruchik, only include the elements of the data to be displayed (e.g. the 7 segments of a numerical display, see item 16 in figure 10) and does not include elements for the background (e.g. the space between the segments).
8. Sekiguchi teaches a liquid crystal display in which there are segment electrodes and auxiliary electrodes surrounding the segment electrodes. Abstract.
9. The auxiliary electrodes allow the display to reverse the brightness and darkness of the pixel area in the display (i.e. allow the display to

present dark numbers on a light background or light numbers on a dark background). Sekiguchi, col. 3, ll. 39-45.

10. Sekiguchi teaches several embodiments for forming the segment electrodes (items 5a-g) and auxiliary electrodes (segments 11). In one embodiment the two electrodes are formed in the same layer. See figures 1-2, col. 11, ll. 25-34.
11. The leads to these electrodes are also in the same layer. *Id*.

ANALYSIS

Initially, we note that Appellants' Brief has not separately addressed the claims rejected based upon the combination of Petruchik and Sekiguchi. As such Appellants have grouped claims 1, 3, 4, 6 through 12, 14, 15, and 17 through 22 together and we select claim 1 as representative of the group. See 37 C.F.R. § 41.37 (c)(1)(vii).

Appellants' arguments have not persuaded us that the Examiner erred in combining Petruchik and Sekiguchi. We find that both references teach segmented liquid crystal displays. Facts 1 and 8. The Examiner found that Petruchik does not teach background electrodes but given Sekiguchi's teaching it would be obvious to include an auxiliary electrode between the segment electrodes. Answer 4. We concur with the Examiner's conclusion. Sekiguchi teaches that the purpose of the auxiliary electrodes is to allow the display to be capable of producing either light elements on a dark background or dark elements on a light background. Fact 9. Appellants' Specification refers to this as negative and positive mode. Specification 9: 14-16. We note that it is the pattern of the electrodes, which includes an electrode surrounding the display segments that permits the display to be

operated in such modes. Facts 8 and 9. We consider using such a pattern of electrodes in the liquid crystal display to be nothing more than using a known arrangement of elements for their known function. As such, we concur with the Examiner's conclusion that the modification of Petruchik to include the auxiliary electrodes as taught by Sekiguchi is obvious. For the aforementioned reasons, Appellants' arguments have not persuaded us that the Examiner erred in combining the teachings of Petruchik and Sekiguchi.

Appellants' arguments on pages 6 and 9 of the Brief, that one would not combine the references as Petruchik is directed to a passive matrix display where the liquid crystal is controlled by electric fields and Sekiguchi is directed to an active matrix display where the liquid crystal is controlled by electric currents have not persuaded us of error in combining the references. Initially, we note that Petruchik's teaching of forming the display is not limited to passive type displays, as Petruchik specifically states that "[o]ther light reflecting, electrically modulated materials can" be used. Col. 3, l. 67-col. 4, l. 3. Further, as discussed *supra*, it is the pattern of the electrodes which allows the display to be driven in positive or negative mode and not the material. As such, we consider that one skilled in the art would recognize that the pattern which includes auxiliary electrodes between the segment electrodes in the display would allow for the positive and negative display modes in both passive and active matrix displays. We do not find, nor have Appellants presented any evidence, which would suggest that using Sekiguchi's pattern of segment electrodes and auxiliary electrodes would not perform their known function in a passive display as taught by Petruchik. Accordingly, Appellants' arguments have not persuaded us that

the Examiner erred in finding that that the combined teachings of Petruchik and Sekiguchi teach a passive matrix display with a conductive layer having electrically separate areas for segments of characters and a background, where the display maybe driven in positive or negative mode

Similarly, Appellants' arguments have not persuaded us that the combination of the references does not teach that there should be holes in the dielectric layer allowing electrical connection to both the segment conductors and the background conductors. Claim 1 recites that there is a second conductor layer over the layer of light modulating material, this layer defining segments of characters and background. Thus, the scope of claim 1 includes that one conductive layer is used to define both segments and background. As discussed above we find that Sekiguchi teaches a conductive layer, the pattern of which includes conductors for both the segments and the background. Facts 9 and 10. Sekiguchi also teaches that this same layer includes leads to the segments and background elements.

Claim 1 also recites a dielectric layer over the patterned conductive layer and that the dielectric layer has holes over each segment and the background area. Claim 1 additionally recites that another conductive layer is overlaid on the dielectric layer and that the conductors in this layer (e.g. electrical leads or traces) are connected to the areas defining the segments and background through the holes. We find that Petruchik teaches that a dielectric layer is placed over a conductive layer which is patterned to define segments of a display. Fact 6. Petruchik teaches that the dielectric layer has holes in it so that conductors of a conductive layer (e.g. electrical leads or traces) above the dielectric layer are connected to the conductive elements which define the segments. Fact 6. We find that one skilled in the art would

recognize that the holes are to allow the conductors (electrical leads or traces) above the dielectric layer to make connections to the patterned conductive areas which make up the display. Thus, while Petruchik does not teach that one of the holes in the dielectric layer corresponds to the background element, one skilled in the art would recognize that if a different pattern is used for the patterned conductive layer, such as a pattern which includes a background conductor, additional holes would also be needed to connect the electrical leads to the conductors of the pattern. As we find that the use of the patterned conductive layer which includes a background element to be an obvious modification of Petruchik, we find that one skilled in the art would recognize that Petruchik's dielectric layer would require additional holes for the additional conductive elements of the display. Accordingly, Appellants' arguments have not persuaded us that the Examiner erred in finding that the combination of the references teaches holes in the dielectric layer over both the segment conductors and the background conductors as claimed in claim 1.

For the above reasons, Appellants' arguments have not persuaded us of error in the Examiner's rejection of claims 1, 3, 4, 6 through 12, 14, 15, and 17 through 22. Accordingly, we sustain the Examiner's rejection of these claims.

Similarly, we are not persuaded of error in the Examiner's rejection of claims 5 and 16. Appellants' arguments on pages 10 through 12 of the Brief present us with the same issues as discussed above with respect to claim 1. As discussed with respect to claim 1 we do not find that the Examiner erred in: combining the references; finding that combined teachings of the references teach a passive matrix display with a conductive layer having

electrically separate areas for segments of characters and a background, where the display maybe driven in positive or negative mode; or finding that the combination of the references teaches holes in the dielectric layer over both the segment conductors and the background conductors. Accordingly, we sustain the Examiner's rejection of claims 5 and 16 for the reasons discussed with respect to claim 1.

ORDER

The decision of the Examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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