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15/332,415	10/24/2016	KEONWOO KIM	8021L-885 (DP-51609-US)	5295

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F. CHAU & ASSOCIATES, LLC
130 WOODBURY ROAD
WOODBURY, NY 11797

EXAMINER
OJEH, NDUKA E

ART UNIT	PAPER NUMBER
2892	

NOTIFICATION DATE	DELIVERY MODE
09/26/2018	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

garramone@chauiplaw.com
mail@chauiplaw.com

Office Action Summary	Application No. 15/332,415	Applicant(s) KIM et al.	
	Examiner NDUKA E OJEH	Art Unit 2892	AIA Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on c6/5/2018.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-9,20-33 and 36 is/are pending in the application.

5a) Of the above claim(s) 10-19 is/are withdrawn from consideration.

6) ☑ Claim(s) 31-33 is/are allowed.

7) ☑ Claim(s) 1-9,20-30 and 36 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Response to Amendment

2. The amendment filed on 6/5/2018 has been entered, claims 10-19 are withdrawn from consideration, claims 34-35 are cancelled, and claim 36 is new; thus claims 1-9, 20-33 and 36 are currently pending in this application.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

> (a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

4. Claim 36 is rejected under 35 U.S.C. 112(a), as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention.

Specifically, the limitation wherein: *"the second organic material layer includes an overlapping portion and a step portion outside the overlapping portion"* and *"an upper surface of the second organic material layer in the step portion is substantially parallel*

to an upper surface of the inorganic insulating layer," are considered as new matter because the specification and Fig. 3B of the instant application do not have support for the second organic material layer including both an overlapping portion and a step portion outside the overlapping portion. Also, an upper surface of the second organic material layer in the step portion does not have any portion that is substantially parallel to an upper surface of the inorganic insulating layer. The second organic material layer does not have an upper surface or any surface at all in the step section.

It is the first organic material layer that indeed has an overlapping portion and a step portion outside the overlapping portion as well as an upper surface of the first organic material layer in the step portion is substantially parallel to an upper surface of the inorganic insulating layer.

Claim Rejections - 35 USC § 102

5. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

7. Claims 1-9, 24-25, 27 and 29 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Fujiyoshi et al. US PGPub. 2015/0380679 of record.

Regarding claim 1, Fujiyoshi teaches a display apparatus (fig. 1-5 and 13) comprising:

a substrate (10, fig. 5 and 13) [0028] comprising a first area (S1, fig. 5 and 13) [0029], a second area (S2/S3, fig. 5 and 13) [0029], and a bending area (C, fig. 5 and 13) [0029] located between the first area (S1) and the second area (S2), the bending area (C) configured to be bent (see fig. 2) about a first bending axis (see fig. 3) extending in a first direction (from front to back, hereinafter F-B, see second and third dotted lines on fig. 4);

an inorganic insulating layer (111, fig. 5 and 13) [0063] arranged over the substrate (10);

a first conductive layer (114, fig. 13) [0053] extending from the first area (S1) to the second area (S2) passing over the bending area (C) and arranged over the inorganic insulating layer (111); and

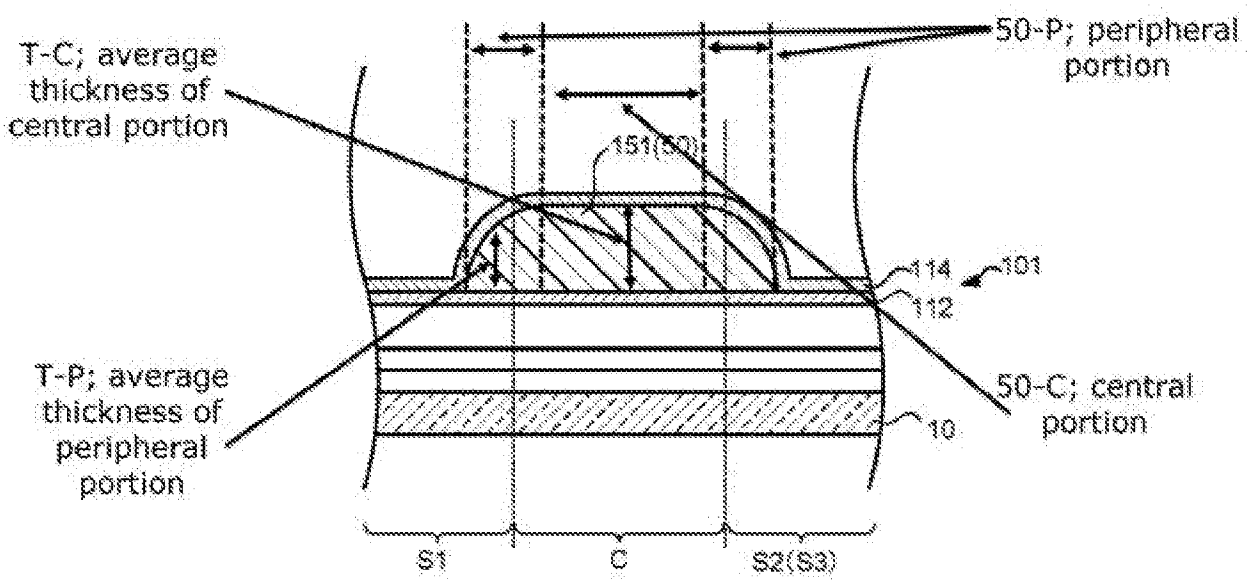
an organic material layer (50, fig. 5 and 13) [0053] arranged between the inorganic insulating layer (111) and the first conductive layer (114) (see fig. 13), contacting (indirect contact, fig, 13) the inorganic insulating layer (111), and comprising a central portion (50-C; see examiner's fig. 1) and a peripheral portion (50-P; see examiner's fig. 1),

wherein the central portion (50-C) overlaps with the bending area (C),

the peripheral portion (50-P) extends from the central portion (50-C), and

an average thickness of the central portion (50-C) is greater than (see examiner's fig. 1) an average thickness of the peripheral portion (50-P) (Fujiyoshi et al., fig. 15 and 13).

Fig. 13 is the embodiment chosen for the rejection and the portion of fig. 13 is substituted for the middle portion/middle pair of squiggly lines of fig. 5.



Examiner's Fig. 1

In order to overcome the current grounds of rejection, the claim must recite that the organic material layer is in direct contact with the inorganic insulating layer because using the broadest reasonable interpretation, "contact" can include intervening layers while "direct contact" cannot include intervening layers.

Regarding claim 2, Fujiyoshi teaches the display apparatus of claim 1, wherein the inorganic insulating layer (111) has a flat upper surface (see fig. 13) at an area (C, fig. 13) overlapping with the organic material layer (50) (Fujiyoshi et al., fig. 13).

Regarding claim 3, Fujiyoshi teaches the display apparatus of claim 1, wherein the central portion (50-C) has a substantially uniform thickness (see examiner's fig. 1)

(Fujiyoshi et al., fig. 13).

Alternatively, regarding claim 1, Fujiyoshi teaches a display apparatus (fig. 1-5 and 13)

comprising:

a substrate (10, fig. 5 and 13) [0028] comprising a first area (S1, fig. 5 and 13) [0029], a second area (S2/S3, fig. 5 and 13) [0029], and a bending area (C, fig. 5 and 13) [0029] located between the first area (S1) and the second area (S2), the bending area (C) configured to be bent (see fig. 2) about a first bending axis (see fig. 3) extending in a first direction (from front to back, hereinafter F-B, see second and third dotted lines on fig. 4);

an inorganic insulating layer (111, fig. 5 and 13) [0063] arranged over the substrate (10);

a first conductive layer (114, fig. 13) [0053] extending from the first area (S1) to the second area (S2) passing over the bending area (C) and arranged over the inorganic insulating layer (111); and

an organic material layer (50, fig. 5 and 13) [0053] arranged between the inorganic insulating layer (111) and the first conductive layer (114) (see fig. 13), contacting (indirect contact, fig, 13) the inorganic insulating layer (111), and comprising a central portion (50-C; see examiner's fig. 2) and a peripheral portion (50-P; see examiner's fig. 2),

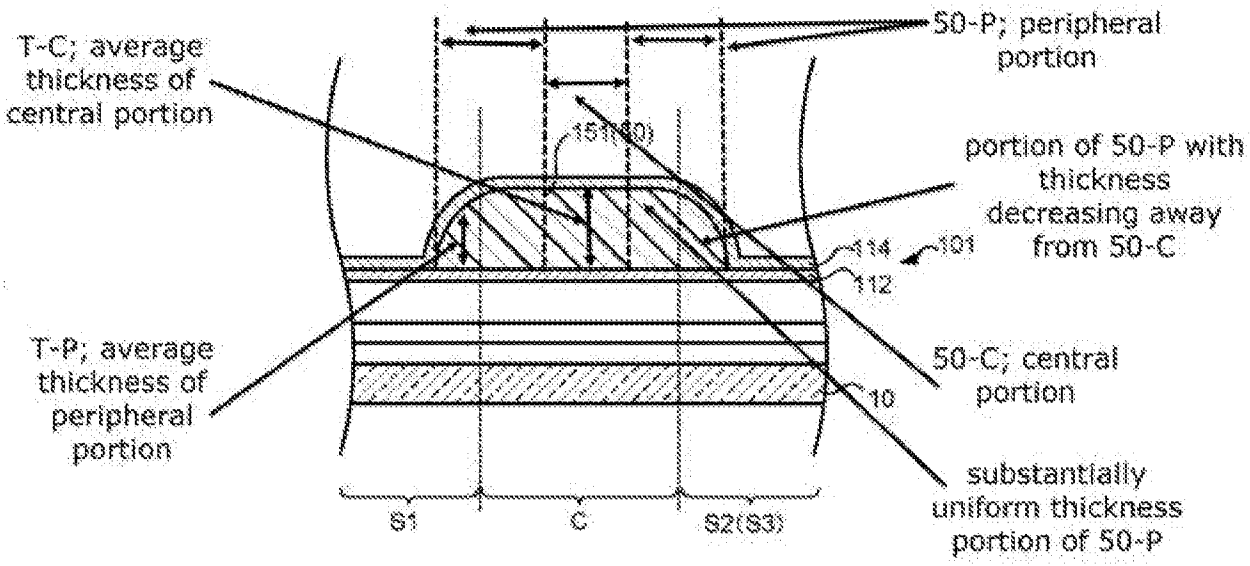
wherein the central portion (50-C) overlaps with the bending area (C),

the peripheral portion (50-P) extends from the central portion (50-C), and

an average thickness of the central portion (50-C) is greater than (see

examiner's fig. 2) an average thickness of the peripheral portion (50-P) (Fujiyoshi et al., fig. 15 and 13).

Fig. 13 is the embodiment chosen for the rejection and the portion of fig. 13 is substituted for the middle portion/middle pair of squiggly lines of fig. 5.



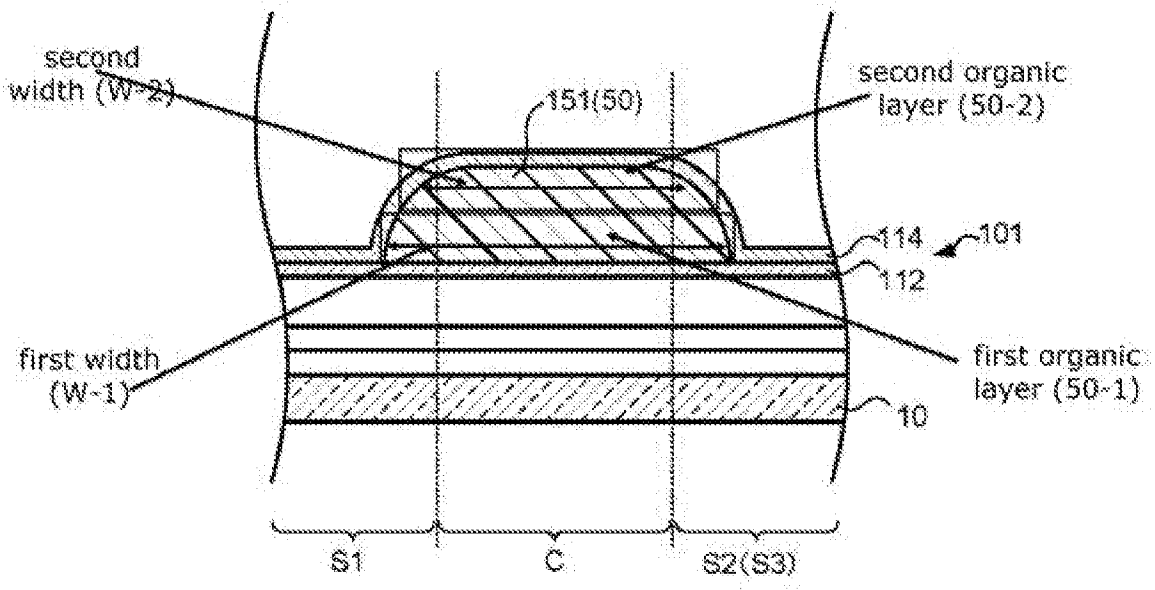
Examiner's fig. 2

Regarding claim 4, Fujiyoshi teaches the display apparatus of claim 1, wherein the peripheral portion (50-P) comprises an area having a substantially uniform thickness (see examiner's fig. 2), and a thickness of the peripheral portion (see examiner's fig. 2) decreases in a direction away from the central portion (see examiner's fig. 2) (Fujiyoshi et al., fig. 13).

Regarding claim 5, Fujiyoshi teaches the display apparatus of claim 1, wherein a thickness of the peripheral portion (50-P) gradually decreases in a direction away from the central portion (50-C) (see examiner's fig. 1) (Fujiyoshi et al., fig. 13).

Regarding claim 6, Fujiyoshi teaches the display apparatus of claim 1,

wherein the organic material (50) layer comprises: a first organic material layer (bottom half portion of 50; hereinafter 50-1, see examiner's fig. 3); and a second organic material layer (top half portion of 50; hereinafter 50-2, see examiner's fig. 3) arranged on the first organic material layer (50-1), wherein the first organic material layer (50-1) has a first width (hereinafter W-1, see examiner's fig. 3), the second organic material layer (50-2) has a second width (hereinafter W-2, see examiner's fig. 3) smaller than the first width (W-1) , the second width (W-2) is greater than a width of the bending area (C) (examiner's fig. 3) (Fujiyoshi et al., fig. 13).



Examiner's Fig. 3

Regarding claim 7, Fujiyoshi teaches the display apparatus of claim 1, wherein the organic material layer (50) has an uneven surface at least partially in an upper surface of the organic material layer (50) (Fujiyoshi et al., fig. 13).

At least a portions of top portion of the organic layer (50) are curved and

hence uneven. Uneven is interpreted as not being straight or parallel or level. As can be seen from fig. 13, only the center portion of the top surface the organic layer (50) is straight, the other portions on the periphery have a curved/uneven surface.

Regarding claim 8, Fujiyoshi teaches the display apparatus of claim 7, wherein the organic material layer (50) has the uneven surface (curved and not straight) in the central portion (portion overlapping C, see fig. 4) (Fujiyoshi et al., fig. 4). When the display is in a curved state as seen in fig. 4, the bent portion is curved and therefore the central portion organic material layer (50) which overlaps the bent portion will also be curved/bent and therefore uneven.

Regarding claim 9, Fujiyoshi teaches the display apparatus of claim 7, wherein an upper surface (top surface) of the first conductive layer (114) over the organic material layer (50) has a shape corresponding to a shape of the upper surface (top surface) of the organic material layer (50).

Regarding claim 24, Fujiyoshi teaches the display apparatus of claim 1, further comprising: a thin film transistor (TFT) (110, fig. 5) [0052] arranged over the first area (S1) or the second area and comprising a source electrode [0064], a drain electrode [0064], and a gate electrode [0064]; and

a planarization layer (151, fig. 5) [0053] covering the TFT (10) and comprising an organic material [0053], wherein the organic material layer (50) comprises substantially the same material as that of the planarization layer (151) (see fig. 13, [0056]) (Fujiyoshi et al., fig. 5 and 13).

Regarding claim 25, Fujiyoshi teaches the display apparatus of claim 1, further comprising: an organic light-emitting device (OLED, fig. 5) [0054] arranged over the first

area (S1) and comprising a pixel electrode (114, fig. 5) [0053], an opposite electrode (translucent electrode, not shown in fig. 5, [0054]) facing the pixel electrode (114), and an intermediate layer (120, fig. 5) [0054] comprising an organic emission layer (120) and arranged between the pixel electrode (114) and the opposite electrode (translucent electrode [0054]; and

a pixel defining layer (153, fig. 5) [0053] arranged over the first area (S1), the pixel defining layer (153) having an opening that exposes a center portion (see fig. 5) of the pixel electrode (114) and defines a pixel area (portion of display region D1 between right edge of 153 and squiggly line, fig. 5), wherein the organic material layer (50) comprises substantially the same material (organic material, [0053] and [0068]) as that of the pixel defining layer (153) (Fujiyoshi et al., fig. 5 and 13).

The light emitting layer 120 of the OLED is considered as an organic emission layer because the light emitting layer is of an organic light emitting device (OLELD) and an OLED necessarily used an organic material for the light emitting layer hence the name organic light emitting device (OLED). Other light emitting layers, not of organic materials, are simply LEDs.

Regarding claim 27, Fujiyoshi teaches the display apparatus of claim 1, further comprising a second conductive layer (112, fig. 5 and 13) arranged over the first area (S1) or the second area (S2), wherein the second conductive layer (112) is located on a layer (located directly in contact with layer 111, fig. 5 and 13) different from a layer (located directly in contact with layer 112 and 50, fig. 5 and 13) on which the first conductive layer (114) is located, and the second conductive layer (112) is electrically connected (both electrically conductive in direct contact with each other, fig. 5) to the

first conductive layer (114) (Fujiyoshi et al., fig. 5 and 13).

Regarding claim 29, Fujiyoshi teaches the display apparatus of claim 27, further comprising a TFT (110, fig. 5) [0052] arranged over the first area (S1) or the second area and comprising a source electrode [0064], a drain electrode [0064], and a gate electrode [0064], wherein the first conductive layer (114) is on a same layer (indirectly on the same substrate (10)) as the source electrode ([0064], see fig. 5) and the drain electrode ([0064], see fig. 5), and the second conductive layer (112) is on a same layer (indirectly on the same substrate (10)) as the gate electrode ([0064], see fig. 5) (Fujiyoshi et al., fig. 5).

All the layers, source, drain, gate, first (114) and second conductive (112) layers are all on the same substrate (10) albeit all in indirect contact with the substrate (10). The claims must specifically recite that the second conductive layer is in direct contact with the same layer that the gate electrode is in direct contact with, in order to overcome the examiner's interpretation of "on the same layer."

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was

commonly owned as of the effective filing date of the claimed invention(s) absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and effective filing dates of each claim that was not commonly owned as of the effective filing date of the later invention in order for the examiner to consider the applicability of 35 U.S.C. 102(b)(2)(C) for any potential 35 U.S.C. 102(a)(2) prior art against the later invention.

10. Claims 20-21 are rejected under 35 U.S.C. 103 as being unpatentable over Fujiyoshi et al. US PGPub. 2015/0380679 as applied to claim 1 above, and further in view of Cheng US PGPub. 2017/0250237, all of record.

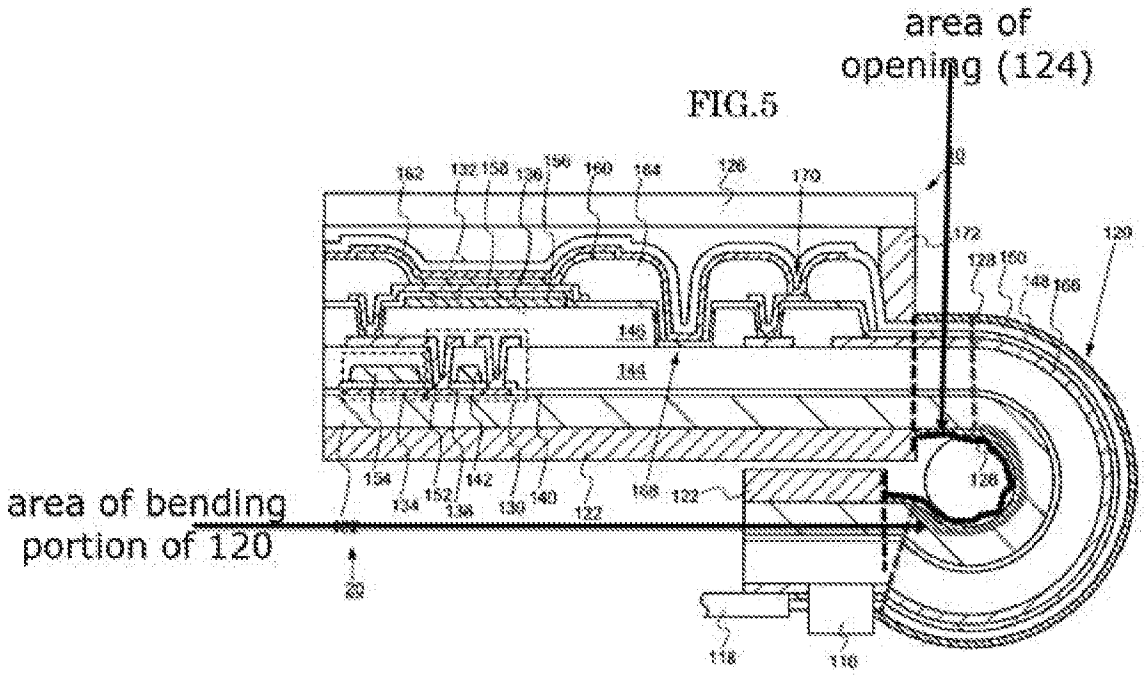
Regarding claim 20, Fujiyoshi does not teach the display apparatus of claim 1, further comprising: a protective film disposed on a lower surface of the substrate (10), wherein the lower surface is opposite a surface of the substrate nearest to the inorganic insulating layer, and the protective film comprises an opening corresponding to the bending area.

However, Cheng teaches a display apparatus (fig. 1-6) comprising a protective film (122, fig. 5) [0021] disposed on a lower surface (top surface) of the substrate (102, fig. 5) [0021], wherein the lower surface is opposite a surface (top surface) of the substrate (102) nearest to the inorganic insulating layer (144, fig. 5) [0035], and the protective film (122) comprises an opening (124, fig. 2 and 5) [0021] corresponding to the bending area (bent portion of 120, fig. 2 and 5) [0020] (Cheng, fig. 2 and 5).

At the time before the effective filing of the invention, it would have been obvious

to one of ordinary skill in the art to combine the teaching of Fujiyoshi with the teaching of Cheng by placing a protective film as taught by Cheng in order to strengthen the substrate by making it thicker but also controlling the bending of the substrate thereby allowing the substrate to easily bend at the position of the opening (Cheng, [0021]).

Regarding claim 21, Fujiyoshi in view of Cheng teaches the display apparatus of claim 20, wherein an area (see examiner's fig. 4) of the opening (124) is larger than an area (see examiner's fig. 4) of the bending area (bent portion of 120) (Cheng, fig. 5).



Examiner's fig. 4

11. Claims 22-23 are rejected under 35 U.S.C. 103 as being unpatentable over Fujiyoshi et al. US PGPub. 2015/0380679 as applied to claim 1 above, and further in view of Kwon et al. US PGPub. 2016/0066409, all of record.

Regarding claim 22, Fujiyoshi teaches the display apparatus of claim 1, further

comprising: an encapsulation layer (170, fig. 5) [0057] covering a display device (OLED, fig. 5) [0054] over the first area (S1) and the first conductive layer (114) is made of indium tin oxide material (ITO, [0067]) (Fujiyoshi et al., fig. 5).

But Fujiyoshi fails to teach a touch electrode configured to provide a touchscreen and located over the encapsulation layer, wherein the first conductive layer comprises substantially the same material as that of the touch electrode.

However, Kwon teaches a display device (fig. 1B) comprising an encapsulation layer (104, fig. 1B) covering a display device (OLED 102, fig. 1B) [0051] over the first area (center portion, fig. 1B) and a touch electrode (112, fig. 1B) [0063] configured to provide a touchscreen and located over the encapsulation layer (104), wherein the touch electrode (112) is made of indium tin oxide material (ITO, [0063]) (Kwon et al., fig. 1B, [0063]).

At the time before the effective filing of the invention, it would have been obvious to one of ordinary skill in the art to combine the teaching of Fujiyoshi with the teaching of Kwon by providing touch electrode on the display device in order to provide more functionalities for the display device such as touch sense or fingerprint identification functionalities (Kwon et al., [0005]).

Therefore Fujiyoshi in view of Kwon teaches wherein the first conductive layer (114 of Fujiyoshi) comprises substantially the same material (indium tin oxide) as that of the touch electrode (112 of Kwon).

Regarding claim 23, Fujiyoshi in view of Kwon teaches the display apparatus of claim 22, further comprising a touch protective layer (cover layer, 114, fig. 1B) [0067] covering the touch electrode (112) and the first conductive layer (pixel electrode of

OLED 102) (Kwon et al., fig. 1B).

At the time before the effective filing of the invention, it would have been obvious to one of ordinary skill in the art to combine the teaching of Fujiyoshi with the teaching of Kwon by providing a protective layer on the touch electrode in order to protect the touch electrode and other layer from damage from impurities.

12. Claim 26 is rejected under 35 U.S.C. 103 as being unpatentable over Fujiyoshi et al. US PGPub. 2015/0380679 as applied to claim 1 above, and further in view of Visweswaran et al. US PGPub. 2017/0179432, all of record.

Regarding claim 26, Fujiyoshi teaches the display apparatus of claim 1, further comprising an encapsulation layer (170, fig. 5) [0057] comprising an organic encapsulation layer (acrylic resin 170, fig. 5) [0070], wherein the organic material layer (50) comprises substantially the same material (acrylic resin, [0041]) as that of the organic encapsulation layer (170) (Fujiyoshi et al., fig. 5, [0041 and 0070]).

But Fujiyoshi fails to teach the encapsulation layer (170) comprising a first inorganic encapsulation layer, a second inorganic encapsulation layer, and an organic encapsulation layer between the first inorganic encapsulation layer and the second inorganic encapsulation layer and covering a display device over the first area.

However, Visweswaran teaches a display apparatus (fig. 7A) comprising an encapsulation layer (720, fig. 7A) [0060] comprising a first inorganic encapsulation layer (722, fig. 7A) [0060], a second inorganic encapsulation layer (726, fig. 7A) [0060], and an organic encapsulation layer (724, fig. 7A) [0060] between the first inorganic

encapsulation layer (722) and the second inorganic encapsulation layer (726) and covering a display device (708, fig. 7A0 [0059] over the first area (X', fig. 7A) (Visweswaran et al., fig. 7A).

At the time before the effective filing of the invention, it would have been obvious to one of ordinary skill in the art to make the simple substitution of the single layer encapsulation layer of Fujiyoshi with the multi-layer encapsulation layer as taught by Visweswaran because an encapsulation layer comprising inorganic and organic encapsulations layers is well known in the art and such material is art recognized suitability for the intended purpose of ensuring proper moisture protection of the display circuitry in the active/display area (Visweswaran et al., [0060]) (see MPEP 2144.07).

13. Claim 28 is rejected under 35 U.S.C. 103 as being unpatentable over Fujiyoshi et al. US PGPub. 2015/0380679 as applied to claim 27 above, and further in view of Honjo US PGPub. 2015/0171113, all of record and as evidenced by https://www.engineeringtoolbox.com/young-modulus-d_417.html

Regarding claim 28, Fujiyoshi does not teach the display apparatus of claim 27, wherein an elongation rate of the first conductive layer (114) is greater than that of the second conductive layer (112).

But Fujiyoshi teaches wherein the display the second conductive layer (112) is made of Al or Ti [0064], the first conductive layer (114) is made of ITO, [0067], and that the display device can also be a top emission type display apparatus [0054] in which case the first conductive layer (114) / pixel electrode could be a reflective material.

With that said, Honjo teaches a display apparatus (Fig. 51) wherein the first conductive layer/pixel electrode is aluminum [0189] and the second conductive layer/source/drain electrode is molybdenum [0121] (Honjo, fig. 51, [0121] and [0189]).

At the time before the effective filing of the invention, it would have been obvious to one of ordinary skill in the art to make the simple substitution of the materials used for the first conductive layer/pixel electrode and the second conductive layer/source/drain electrode of Fujiyoshi with the materials used for the first conductive layer/pixel electrode and the second conductive layer/source/drain electrode of Honjo because such materials are well known in the art and such substitution is art recognized equivalence for the same purpose to obtain predictable results such as a display device where the pixel and source/drain electrodes have excellent conductivity (see MPEP 2144.06).

Also, at the time before the effective filing of the claimed invention, it would have been obvious to one of ordinary skill in the art to make the simple substitution of the materials used for the first conductive layer/pixel electrode and the second conductive layer/source/drain electrode of Fujiyoshi with the materials used for the first conductive layer/pixel electrode and the second conductive layer/source/drain electrode of Honjo because Honjo discloses a finite number of materials to use for the pixel and source/drain electrode [0121] and [0189]. Therefore, a person of ordinary skill in the art has a good reason to pursue using aluminum for the pixel electrode for a top emission type display device and using molybdenum for the source/drain electrode within his or her technical grasp with a reasonable expectation of success. It has been held that, if this leads to anticipated success, it is likely that the product or process [was] not of

innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under 35 U.S.C. § 103. See MPEP 2143 section (E "Obvious To Try").

Therefore, with the material substitution of Fujiyoshi with that of Honjo, Fujiyoshi in view of Honjo will necessarily yield a display apparatus of claim 27, wherein an elongation rate of the first conductive layer (114/pixel electrode substituted with aluminum of Honjo) is greater than that of the second conductive layer (112/source/drain electrode substituted with molybdenum of Honjo) because aluminum has a young's modulus of ~69GPa while molybdenum has a young's modulus of ~329GPa. A higher young's modulus means a harder/stiffer material and hence a smaller elongation rate (elasticity) than a material having a smaller young's modulus which means a softer material and hence a greater elongation rate (elasticity). See https://www.engineeringtoolbox.com/young-modulus-d_417.html showing the modulus of elasticity/young's modulus of aluminum and molybdenum.

14. Claim 30 is rejected under 35 U.S.C. 103 as being unpatentable over Fujiyoshi et al. US PGPub. 2015/0380679 as applied to claim 1 above, and further in view of Park et al., US PGPub. 2014/0299884, all of record.

Regarding claim 30, Fujiyoshi does not teach the display apparatus of claim 1, further comprising a stress neutralization layer arranged over an upper portion of the first conductive layer (114).

However, Park teaches a display apparatus (Fig. 12-15) comprising a stress

neutralization layer (92, fig. 12 and 15) [0057] arranged over an upper portion of the first conductive layer (80, fig. 12 and 15) [0052] (Park et al., fig. 12 and 15, [0057]).

At the time before the effective filing of the invention, it would have been obvious to one of ordinary skill in the art to combine the teaching of Fujiyoshi with the teaching of Park by using a stress neutralizer on the curved portion of the display/on the upper portion of the first conductive layer in order to balance out the stress of lower the stress on the first conductive layer even in situations where the display device if bent at a right angle (Park et al., [0058]).

Allowable Subject Matter

15. Claim 1-9 and 20-33 are allowed.

16. The following is an examiner's statement of reasons for allowance: the prior arts of record taken alone or in combination neither anticipates nor renders obvious the display apparatus wherein "an upper surface of the inorganic insulating layer and an upper surface of the peripheral portion of the organic material layer contact, forming an angle that is less than or equal to 45 degrees," as recited in claim 31.

17. Claims 32-33 are also allowed for further limiting and depending upon allowed claim 31.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Remarks

18. Claim 36 is also indicated as allowed if the 112(a) rejection can be overcome.

19. The following is an examiner's statement of reasons for indicating allowance: the prior arts of record taken alone or in combination neither anticipates nor renders obvious the display apparatus wherein *"the second organic material layer includes an overlapping portion and a step portion outside the overlapping portion"* and *"an upper surface of the second organic material layer in the step portion is substantially parallel to an upper surface of the inorganic insulating layer,"* as recited in claim 36.

20. Furthermore, claim 36 will also be allowed if the limitation was amended to read as: *"the* ~~***second***~~ ***first*** *organic material layer includes an overlapping portion and a step portion outside the overlapping portion"* and *"an upper surface of the* ~~***second***~~ ***first*** *organic material layer in the step portion is substantially parallel to an upper surface of the inorganic insulating layer,"* which is supported in the specification of instant application (see fig. 3B) and would overcome the 112(a) rejection.

Response to Arguments

21. Applicant's arguments with respect to claims 1-9 and 20-30 have been considered but are moot because the arguments do not apply to the new interpretation of the same reference being used in the current rejection as that used in the previous rejection. See remarks regarding the interpretation of the word "contact."

Conclusion

22. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NDUKA E OJEH whose telephone number is (571)270-0291. The examiner can normally be reached on M-F; 9am - 5pm..

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao X Le can be reached on (571) 272-1708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LEX H MALSAWMA/
Primary Examiner, Art Unit 2892

/NDUKA E OJEH/
Examiner, Art Unit 2892
Thursday, September 20, 2018.