

EXHIBIT 2051

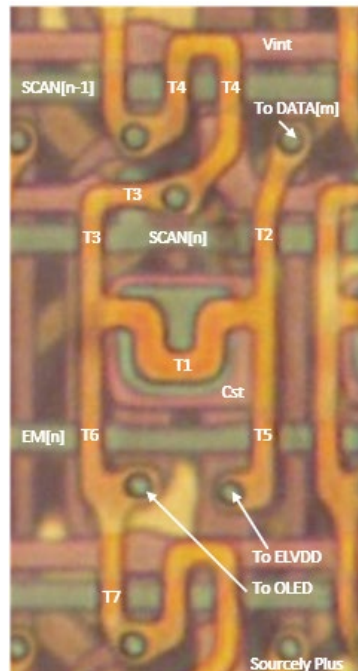
CLAIM CHART: AMOLED DISPLAY IN SOURCELY PLUS PRODUCT

U.S. Pat. No. 7,414,599

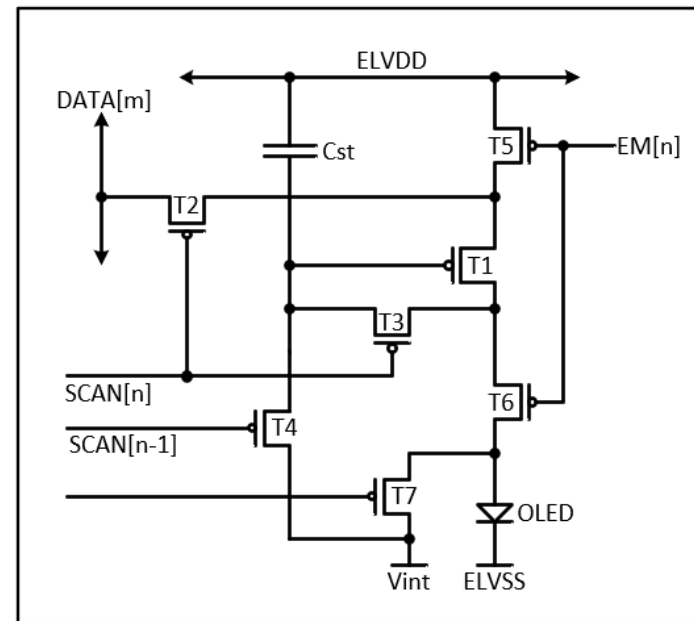
Sourcely Plus Product

1[preamble] A pixel circuit in an organic light emitting device, comprising:

The Sourcely Plus Product includes a pixel circuit in an organic light-emitting device. For example, the circuit diagram below of the Sourcely Plus 12Pro Soft OLED depicts the transistors **T1–T7**, the capacitor **Cst**, and the **OLED** element.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



Sourcely Plus Equivalent Circuit

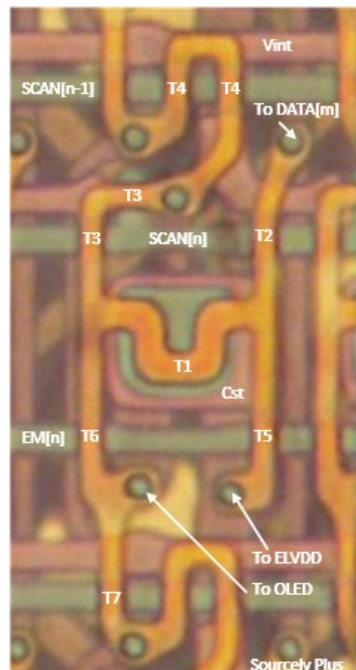
U.S. Pat. No. 7,414,599	Sourcely Plus Product
<p>1[preamble] A pixel circuit in an organic light emitting device, comprising:</p> <p>(cont'd)</p>	 <p>Exhibit 2038 Sourcely Plus Teardown Photos) at 1, 4</p>

U.S. Pat. No. 7,414,599

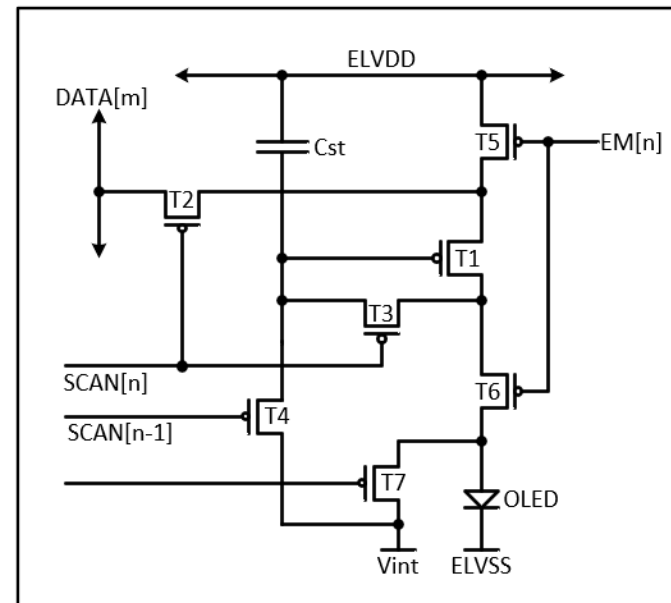
Sourcely Plus Product

1[a] a first transistor for delivering a data signal voltage in response to a current scan line signal;

The pixel circuit of the Sourcely Plus Product has a first transistor for delivering a data signal voltage in response to a current scan line signal. As shown in the circuit diagram below, the first transistor **T2** is coupled to a data line **DATA[m]** for delivering a data signal voltage. The gate of first transistor **T2** is coupled to a scan line **SCAN[n]** that delivers a current scan line signal to the gate of first transistor **T2**. In response to the current scan line signal being active (low), first transistor **T2** delivers a data signal voltage from data line **DATA[m]**.



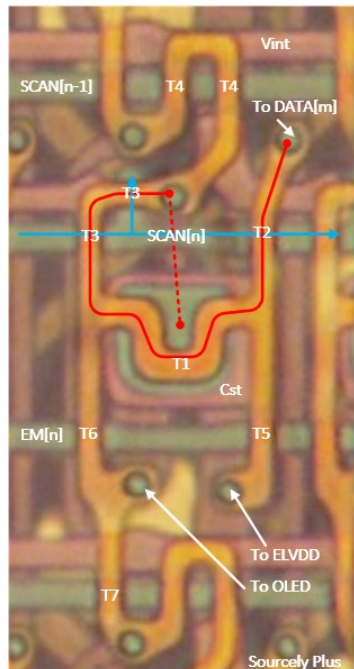
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



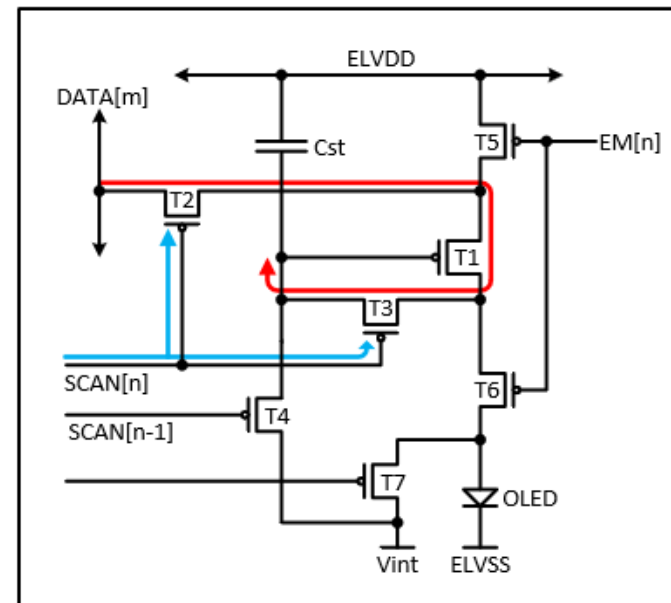
Sourcely Plus Equivalent Circuit

1[a] a first transistor for delivering a data signal voltage in response to a current scan line signal;
(cont'd)

As further shown in the annotated circuit diagram below, in response to an active (low) current scan line signal (blue line) delivered on scan line **SCAN[n]**, first transistor **T2** delivers the data signal voltage (red line) present on data line **DATA[m]**. The annotated circuit diagram below depicts an exemplary voltage path from data line **DATA[m]** through transistors **T2-T1-T3** to the gate of transistor **T1**.



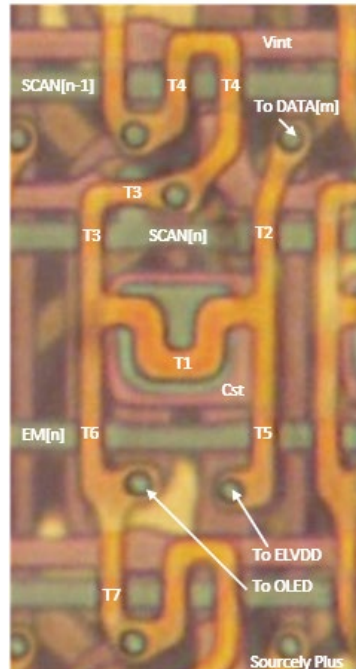
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



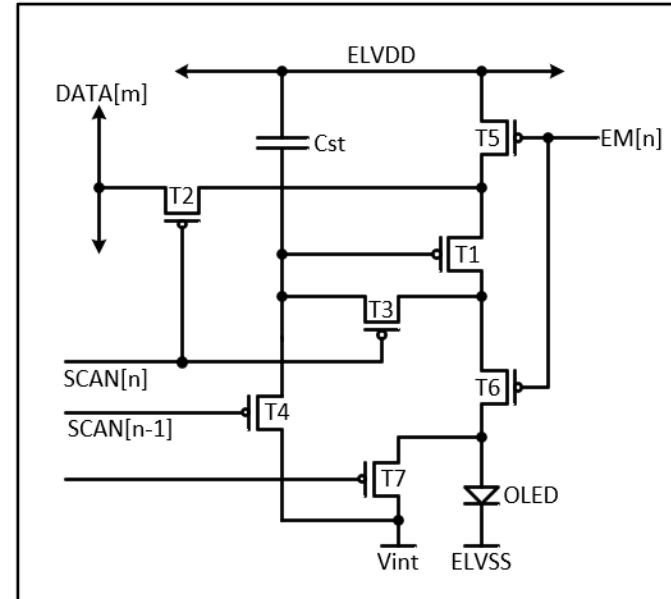
Sourcely Plus Equivalent Circuit

1[b] a second transistor for generating a driving current depending on the data signal voltage delivered through the first transistor;

The pixel circuit of the Sourcely Plus Product has a second transistor for generating a driving current depending on the data signal voltage delivered through the first transistor. As shown in the circuit diagram below, the second transistor **T1** is coupled to a power supply voltage **ELVDD**. As described for claim element **1[a]** above, the first transistor **T2** delivers a data signal voltage in response to an active (low) current scan line signal that is delivered on scan line **SCAN[n]**. The data signal voltage is stored on the capacitor **Cst**. The second transistor **T1** will generate a driving current dependent upon the voltage stored on the capacitor **Cst**, and the current will be sourced from **ELVDD**.



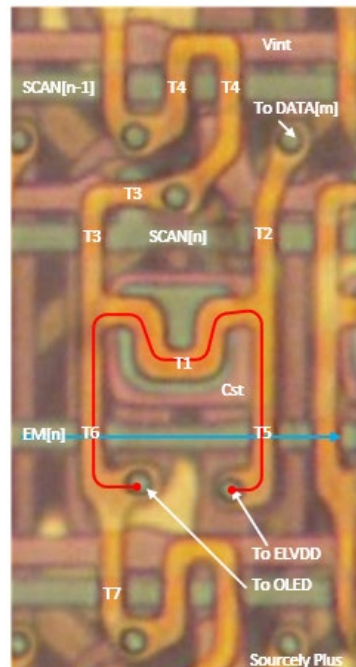
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



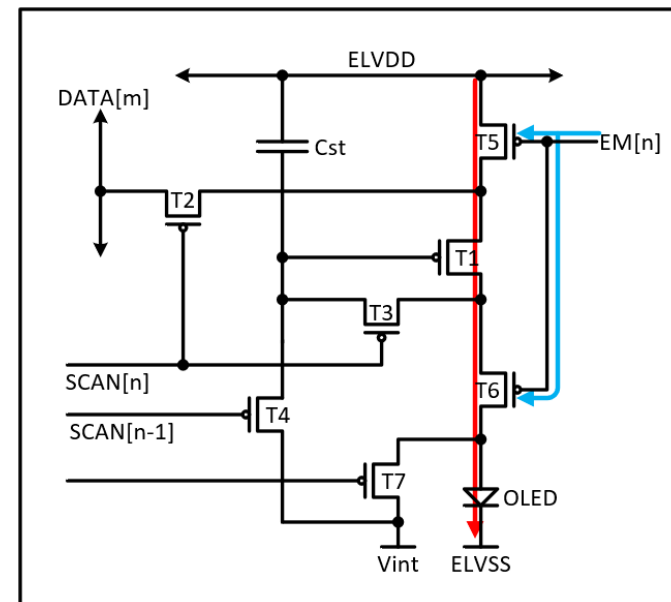
Sourcely Plus Equivalent Circuit

1[b] a second transistor for generating a driving current depending on the data signal voltage delivered through the first transistor;
(*cont'd*)

For example, as shown in the annotated circuit diagram below, in response to an active (low) current light-emitting signal (blue line) delivered on emission line **EM[n]**, transistors **T5** and **T6** turn on, and a driving current (red line) flows from **ELVDD** through second transistor **T1** to the **OLED**. The amount of current that flows through second transistor **T1** to the **OLED** is dependent upon the voltage that was stored on the capacitor **Cst**, which is based on the data signal voltage delivered previously through first transistor **T2** (see claim element **1[f]**, below).



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



Sourcely Plus Equivalent Circuit

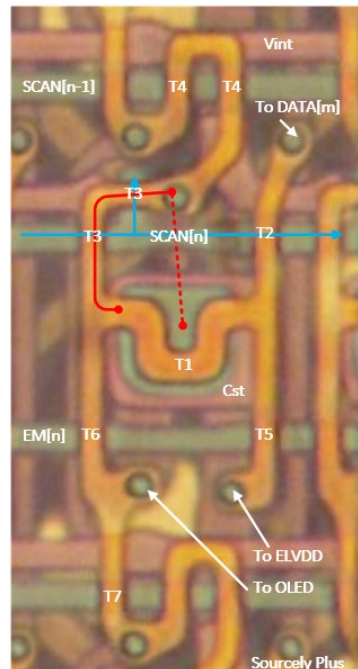
U.S. Pat. No. 7,414,599

Sourcely Plus Product

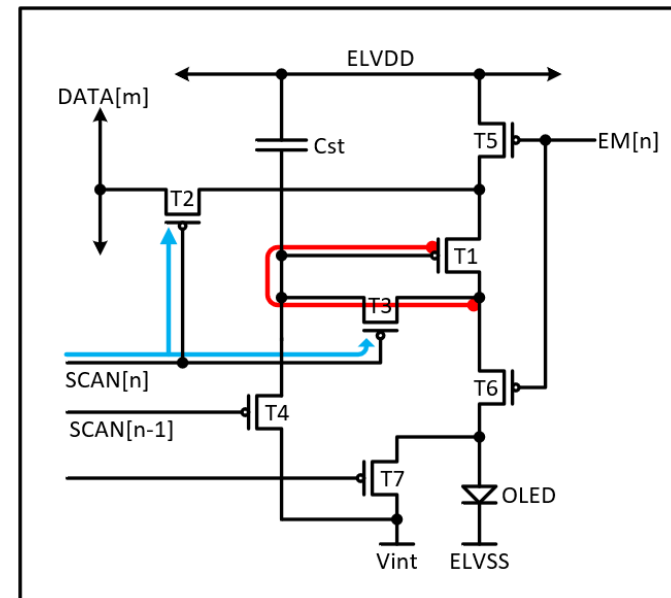
1[c] a third transistor for detecting and self-compensating threshold voltage deviation in the second transistor;

The pixel circuit of the Sourcely Plus Product has a third transistor for detecting and self-compensating threshold voltage deviation in the second transistor. As shown in the annotated circuit diagram below, a third transistor **T3** is coupled between the drain and gate of the second transistor **T1** for detecting and self-compensating threshold voltage deviation in second transistor **T1**.

Third transistor **T3** is connected between the gate and the drain of second transistor **T1**. In response to an active (low) current scan line signal (blue line) delivered on scan line **SCAN[n]**, third transistor **T3** connects the drain and gate of second transistor **T1** together (red line) in the form of a diode to self-compensate a threshold voltage of second transistor **T1**.



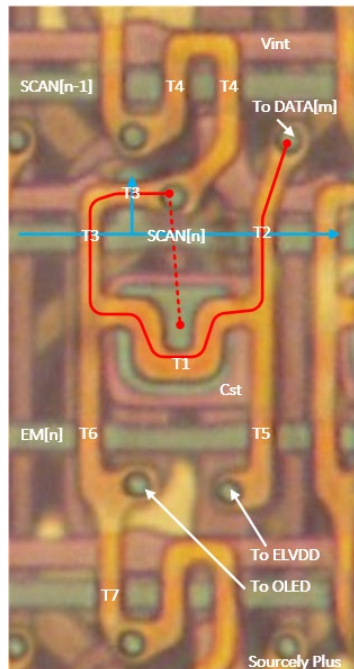
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



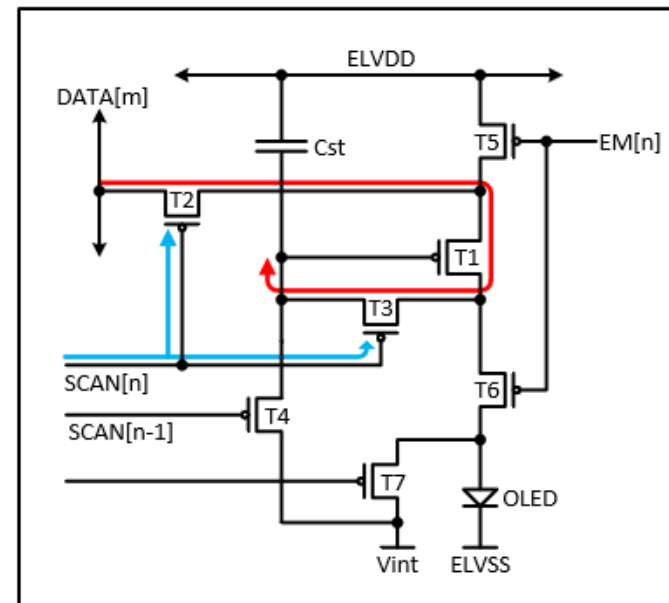
Sourcely Plus Equivalent Circuit

1[c] a third transistor for detecting and self-compensating threshold voltage deviation in the second transistor;
(cont'd)

As shown in the annotated circuit diagram below, in response to an active (low) current scan line signal (blue line) delivered on scan line **SCAN[n]**, transistors **T2** and **T3** turn on and a data signal voltage (red line) on data line **DATA[m]** flows through transistors **T2-T1-T3** and is stored on the capacitor **Cst**. This arrangement allows for the detection and self-compensation of the threshold voltage deviation in second transistor **T1**.



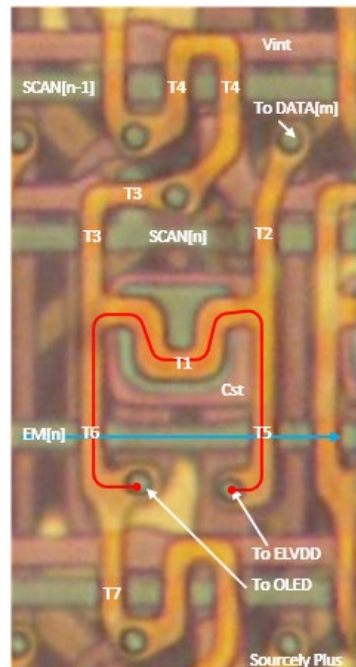
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



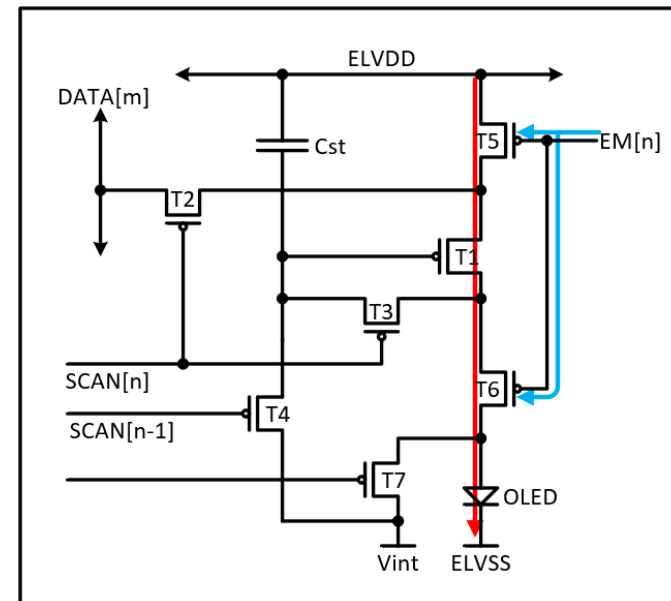
Sourcely Plus Equivalent Circuit

1[d] a fifth transistor for providing a power supply voltage for the second transistor in response to a current light-emitting signal; (cont'd)

For example, as shown in the annotated circuit diagram below, in response to an active (low) current light-emitting signal (blue line) delivered on emission line **EM[n]**, fifth transistor **T5** turns on and provides a power supply voltage **ELVDD** (red line) to second transistor **T1**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



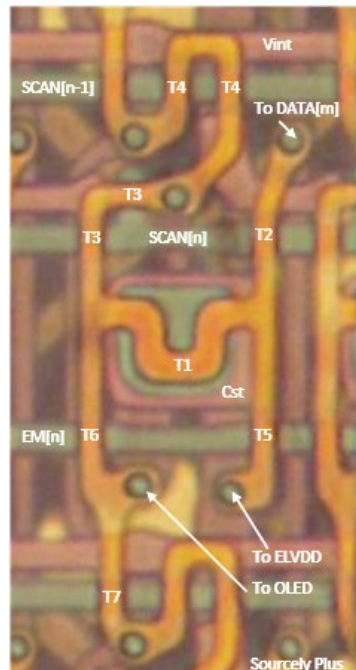
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

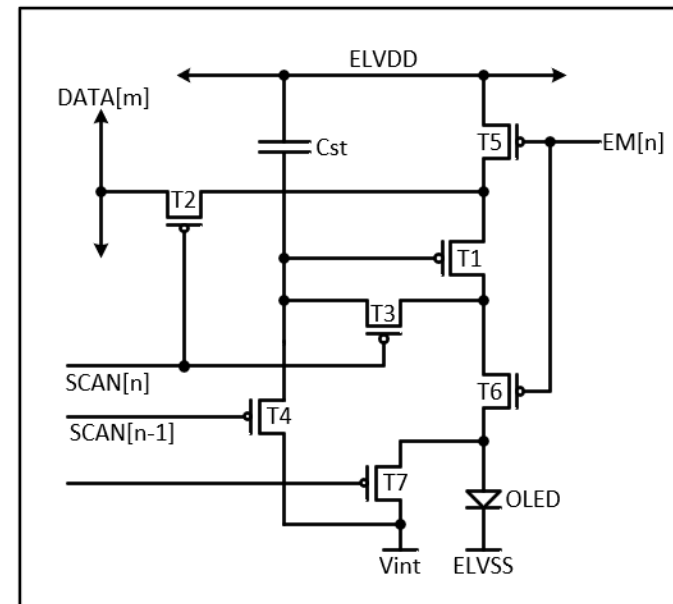
1[e] a sixth transistor which is coupled in series between the second transistor and an electroluminescent element and for providing the driving current for the electroluminescent element through the second transistor in response to the current light-emitting signal; and

Sourcely Plus Product

The pixel circuit of the Sourcely Plus Product has a sixth transistor that is coupled in series between the second transistor and an electroluminescent element and for providing the driving current for the electroluminescent element through the second transistor in response to the current light-emitting signal. As shown in the circuit diagram below, the sixth transistor **T6** is coupled to the second transistor **T1** and to an electroluminescent element (**OLED**). As shown in the circuit diagram below, sixth transistor **T6** is in series between second transistor **T1** and the **OLED**. In response to an active (low) current light-emitting signal delivered on emission line **EM[n]**, sixth transistor **T6** turns on and provides driving current that flows through second transistor **T1** to the **OLED**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



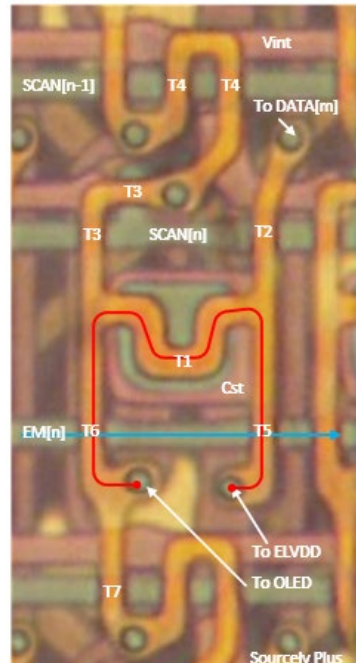
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

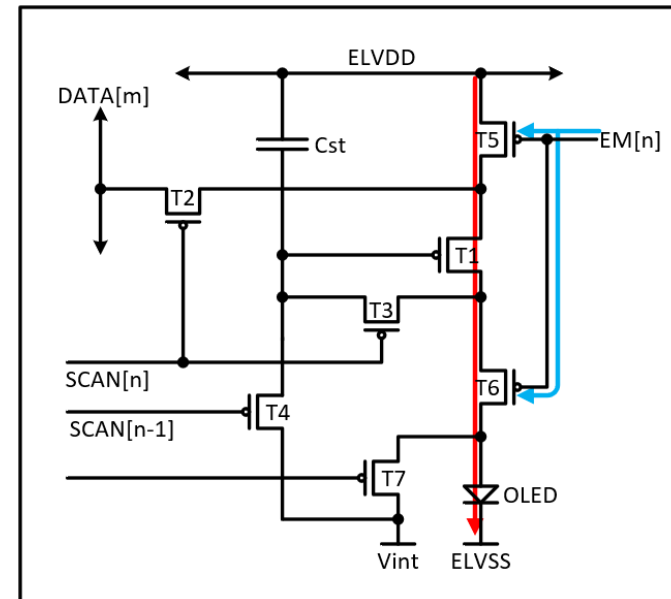
Sourcely Plus Product

1[e] a sixth transistor which is coupled in series between the second transistor and an electroluminescent element and for providing the driving current for the electroluminescent element through the second transistor in response to the current light-emitting signal; and
(cont'd)

As shown in the annotated circuit diagram below, sixth transistor **T6** is coupled in series between second transistor **T1** and the **OLED**. In response to an active (low) current light-emitting signal (blue line) delivered on emission line **EM[n]**, sixth transistor **T6** turns on, and the driving current flows (red line) from second transistor **T1** through sixth transistor **T6** to the **OLED**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



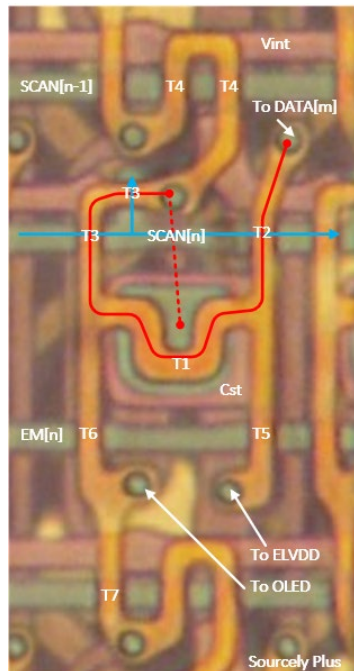
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

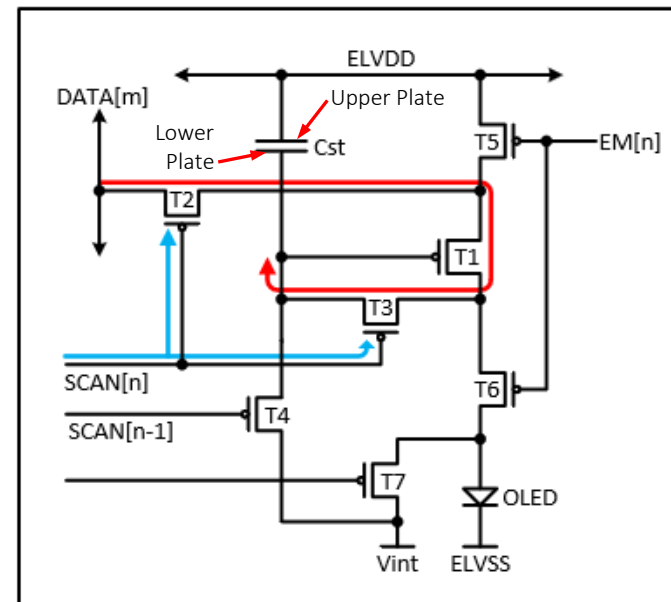
Sourcely Plus Product

1[f] a capacitor for storing the data signal voltage delivered to the second transistor,

The pixel circuit of the Sourcely Plus Product has a capacitor for storing the data signal voltage delivered to the second transistor. As shown in the annotated circuit diagram below, the capacitor **Cst** has an upper plate and a lower plate. The capacitor **Cst** stores the data signal voltage delivered to the second transistor **T1**. In response to an active (low) current scan line signal (blue line) delivered on scan line **SCAN[n]**, first transistor **T2** delivers the data signal voltage (red line) on data line **DATA[m]** to second transistor **T1** and to capacitor **Cst** (see *also* claim elements **1[a]**, **1[b]** above).



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



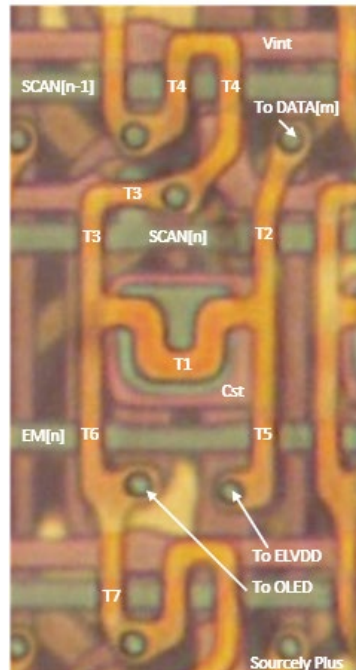
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

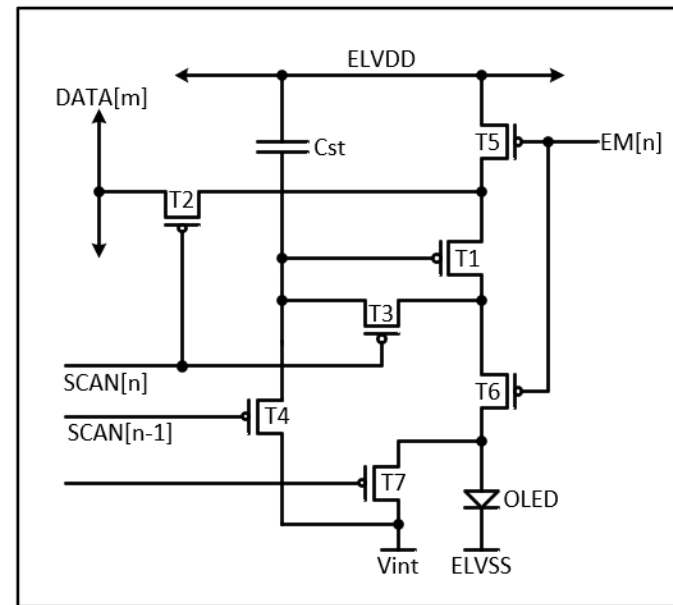
1[g] wherein the electroluminescent element emits light corresponding to the driving current generated through the second transistor.

Sourcely Plus Product

In the pixel circuit of the Sourcely Plus Product, the electroluminescent element emits light corresponding to the driving current generated through the second transistor. As shown in the circuit diagram below, the driving current flows from a power supply voltage **ELVDD** through fifth transistor **T5**, through second transistor **T1**, and through sixth transistor **T6** to the **OLED**. The amount of light emitted from the **OLED** corresponds to the driving current generated by second transistor **T1** and delivered through the sixth transistor **T6**.



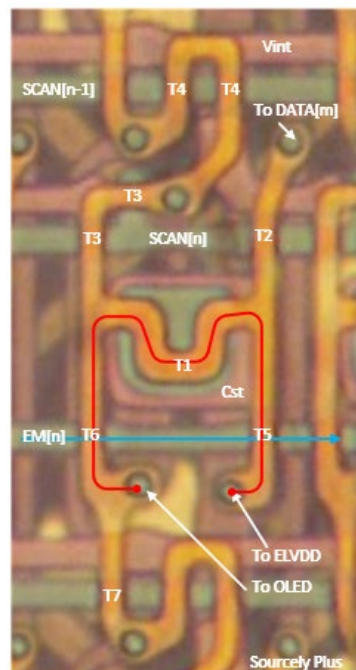
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



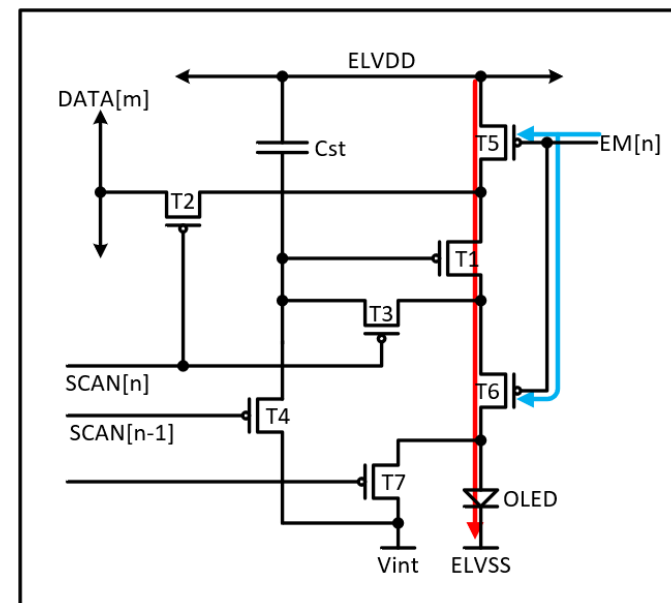
Sourcely Plus Equivalent Circuit

1[g] wherein the electroluminescent element emits light corresponding to the driving current generated through the second transistor. (cont'd)

As reflected in the annotated circuit diagram below, in response to an active (low) current light-emitting signal (blue line) delivered on emission line **EM[n]**, transistors **T5** and **T6** turn on, and current (red line) can flow from **ELVDD** through transistors **T5-T1-T6** to the **OLED**. The voltage stored by capacitor **Cst** (see also claim element **1[f]**, above) is applied to the gate of second transistor **T1**, and this applied voltage determines the amount of driving current that flows through second transistor **T1** to the **OLED**, which in turn determines the amount of light emitted by the **OLED**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



Sourcely Plus Equivalent Circuit

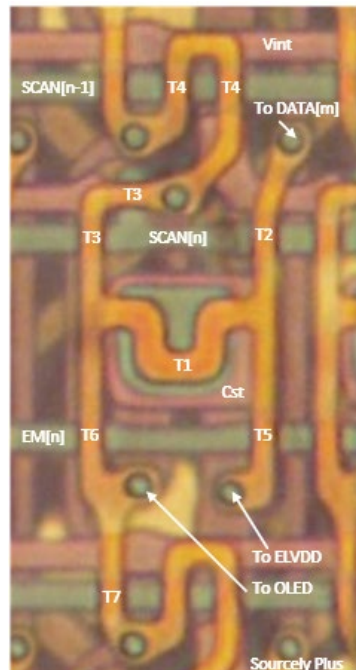
U.S. Pat. No. 7,414,599	Sourcely Plus Product
<p>3. The pixel circuit in the organic light emitting device of claim 1, wherein the first transistor is composed of a PMOS transistor including a gate to which the current scan line signal is applied, a source to which the data signal voltage is applied, and a drain coupled to the second transistor.</p>	<p>The pixel circuit of the Sourcely Plus Product has a first transistor composed of a PMOS transistor, including a gate to which the current scan line signal is applied, a source to which the data signal voltage is applied, and a drain coupled to the second transistor.</p> <p>As shown in the annotated circuit diagram below, the circuit symbol for the first transistor T2 indicates that it is a PMOS transistor.</p> <p>As shown in the annotated circuit diagram below, the first transistor T2 includes a gate to which the current scan line signal delivered on scan line SCAN[n] is applied, a source to which the data signal voltage from data line DATA[m] is applied, and a drain coupled to the second transistor T1.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div data-bbox="711 675 1066 1341" data-label="Image"> <p>This SEM photo shows the physical layout of the pixel circuit. Labels include: SCAN[n-1], T4, T4, Vint, To DATA[m], T3, T3, SCAN[n], T2, T1, Cst, EM[n], T6, T5, To ELVDD, To OLED, T7, and Sourcely Plus.</p> </div> <div data-bbox="1163 675 1827 1276" data-label="Diagram"> <p>The schematic diagram shows the equivalent circuit. It includes a PMOS transistor T2 with its gate connected to SCAN[n], source to DATA[m], and drain to the source of T1. T1 is an NMOS transistor with its gate connected to SCAN[n-1] and drain to ELVDD. Other transistors T3, T4, T5, T6, and T7 are also shown, along with capacitors Cst and connections to ELVDD, ELVSS, and the OLED.</p> </div> </div> <p style="text-align: center;">Sourcely Plus Equivalent Circuit</p> <p>Annotated Exhibit 2038 at 5 (Sourcely Plus Teardown Photos)</p>

4. The pixel circuit in the organic light emitting device of claim 1, wherein the second transistor is composed of a PMOS transistor including a gate coupled to one terminal of the capacitor, a source coupled to the first transistor, and a drain coupled to the electroluminescent element.

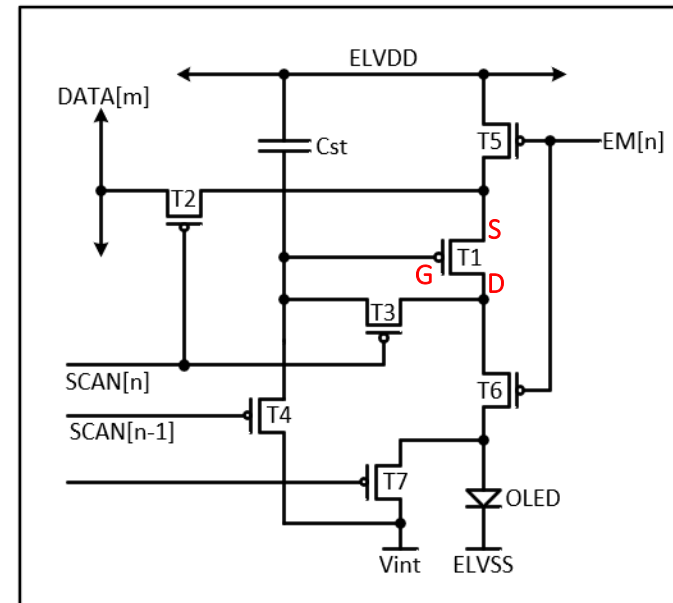
The pixel circuit of the Sourcely Plus Product has a second transistor composed of a PMOS transistor, including a gate coupled to one terminal of the capacitor, a source coupled to the first transistor, and a drain coupled to the electroluminescent element.

As shown in the circuit diagram below, the circuit symbol for the second transistor **T1** indicates that it is a PMOS transistor.

As shown in the circuit diagram below, the second transistor **T1** includes a gate coupled to one terminal of the capacitor **Cst**, a source coupled to the first transistor **T2**, and a drain coupled to the electroluminescent element through sixth transistor **T6**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599	Sourcely Plus Product
<p>5. The pixel circuit in the organic light emitting device of claim 4, wherein the third transistor is composed of a PMOS transistor including a gate to which the current scan signal is applied, and a drain and a source which are coupled to the gate and the drain of the second transistor, respectively, so that the third transistor connects the second transistor in the form of a diode in response to the current scan signal to self-compensate a threshold voltage of the second transistor.</p>	<p>The pixel circuit of the Sourcely Plus Product has a third transistor composed of a PMOS transistor, including a gate, to which the current scan signal is applied, and a drain and a source that are coupled to the gate and the drain of the second transistor, respectively, so that the third transistor connects the second transistor in the form of a diode in response to the current scan signal to self-compensate a threshold voltage of the second transistor.</p> <p>As shown in the annotated circuit diagram below, the circuit symbol for the third transistor T3 indicates that it is a PMOS transistor. As shown in the annotated circuit diagram below, the third transistor T3 includes a gate to which the current scan signal delivered on scan line SCAN[n] is applied, a drain coupled to the gate of the second transistor T1, and source coupled to the drain of second transistor T1. In response to an active (low) current scan line signal (blue line) delivered on scan line SCAN[n], third transistor T3 connects the drain and gate of second transistor T1 together (red line) in the form of a diode to self-compensate a threshold voltage of second transistor T1.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div data-bbox="730 743 1054 1352" data-label="Image"> </div> <div data-bbox="1163 743 1822 1339" data-label="Diagram"> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div data-bbox="709 1352 1075 1458" data-label="Caption"> <p>Annotated Exhibit 2038 at 5 (Sourcely Plus Teardown Photos)</p> </div> <div data-bbox="1285 1344 1705 1380" data-label="Caption"> <p>Sourcely Plus Equivalent Circuit</p> </div> </div>

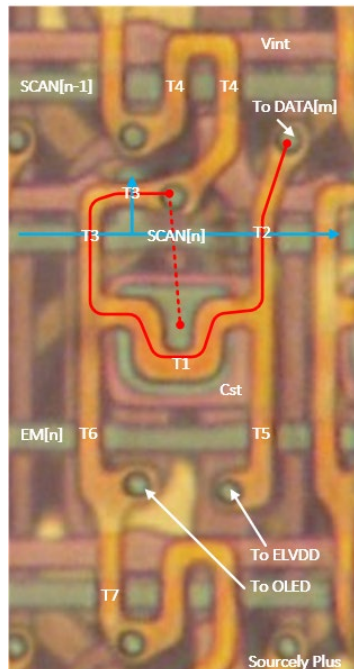
U.S. Pat. No. 7,414,599

6. The pixel circuit in the organic light emitting device of claim 1, further comprising:
a voltage source for providing the data signal voltage through the first transistor for the second transistor.

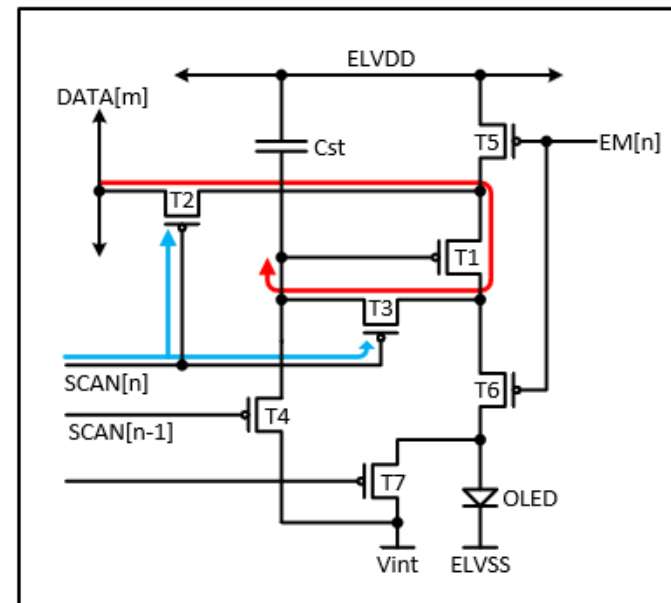
Sourcely Plus Product

In the pixel circuit of the Sourcely Plus Product, a voltage source for providing the data signal voltage through the first transistor for the second transistor is shown.

As shown in the annotated circuit diagram below, in response to an active (low) current scan line signal (blue line) delivered on scan line **SCAN[n]**, the first transistor **T2** turns on and provides the data signal voltage (red line) from the data line **DATA[m]** to the second transistor **T1**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



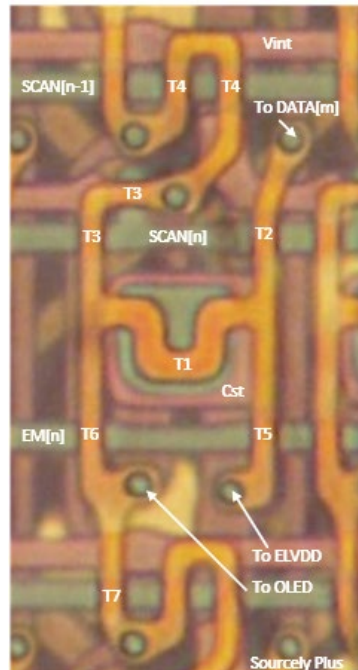
Sourcely Plus Equivalent Circuit

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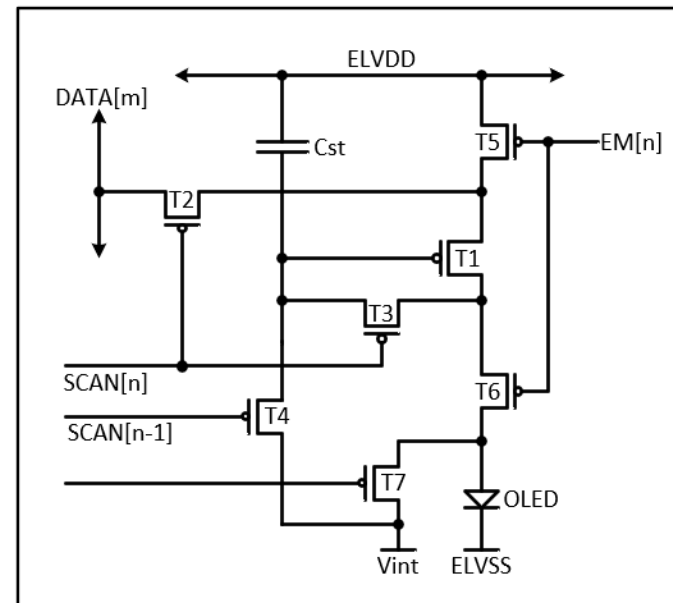
Sourcely Plus Product

7[preamble] A pixel circuit in an organic light emitting device, comprising:

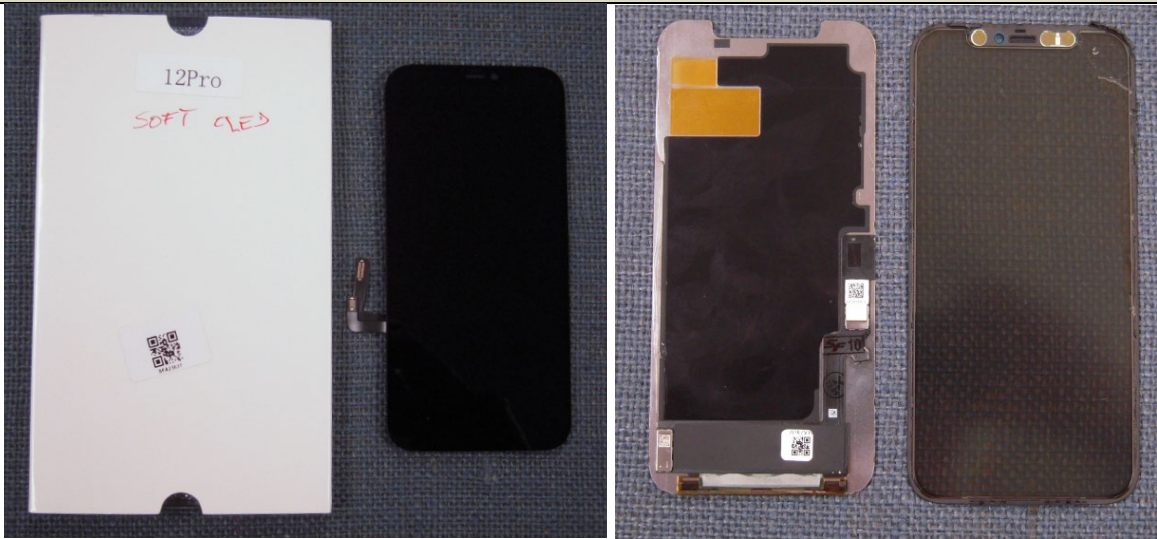
The Sourcely Plus Product includes a pixel circuit in an organic light-emitting device. For example, the circuit diagram below of the Sourcely Plus 12Pro Soft OLED depicts the transistors **T1–T7**, the capacitor **Cst**, and the **OLED** element.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)

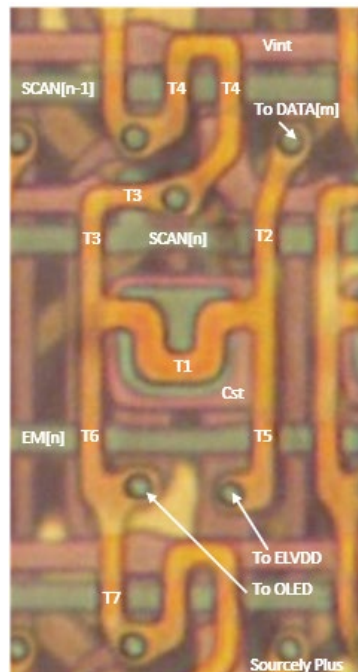


Sourcely Plus Equivalent Circuit

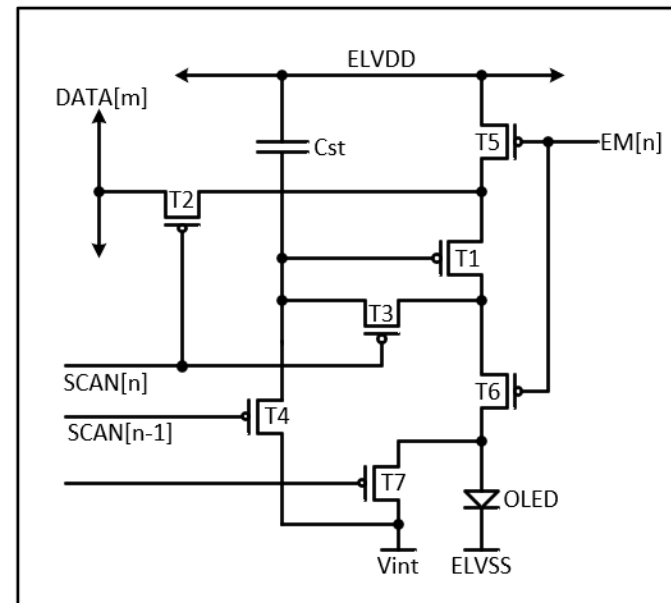
U.S. Pat. No. 7,414,599	Sourcely Plus Product
<p>7[preamble] A pixel circuit in an organic light emitting device, comprising:</p> <p>(cont'd)</p>	 <p>Exhibit 2038 Sourcely Plus Teardown Photos) at 1, 4</p>

7[a] a first transistor for delivering a data signal voltage in response to a current scan line signal;

The pixel circuit of the Sourcely Plus Product has a first transistor for delivering a data signal voltage in response to a current scan line signal. As shown in the circuit diagram below, the first transistor **T2** is coupled to a data line **DATA[m]** for delivering a data signal voltage. The gate of first transistor **T2** is coupled to a scan line **SCAN[n]** that delivers a current scan line signal to the gate of first transistor **T2**. In response to an active (low) current scan line signal delivered on scan line **SCAN[n]**, first transistor **T2** delivers a data signal voltage from data line **DATA[m]**.



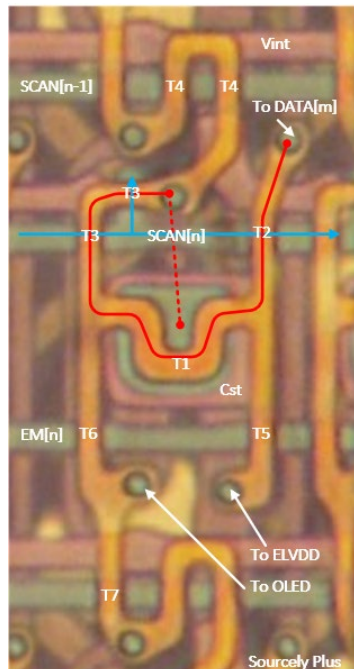
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



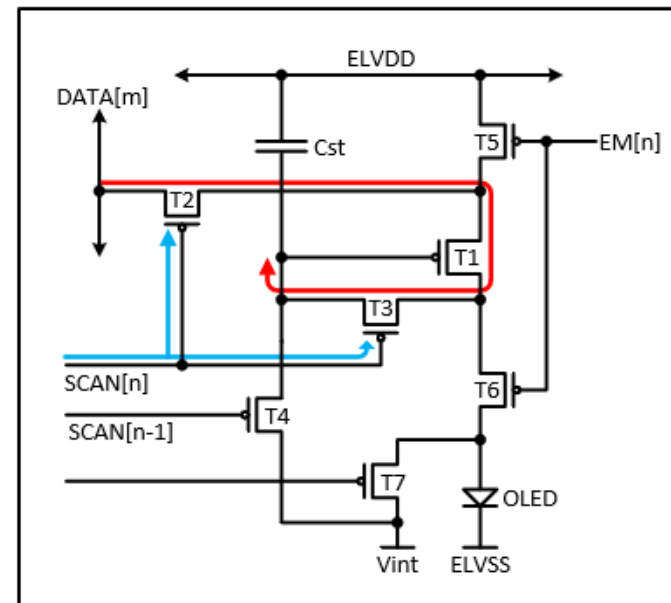
Sourcely Plus Equivalent Circuit

7[a] a first transistor for delivering a data signal voltage in response to a current scan line signal;
(*cont'd*)

As reflected in the annotated circuit diagram below, in response to an active (low) current scan line signal (blue line) delivered on scan line **SCAN[n]**, first transistor **T2** delivers the data signal voltage (red line) present on data line **DATA[m]**. The annotated circuit diagram below depicts an exemplary voltage path from data line **DATA[m]** through transistors **T2-T1-T3** to the gate of transistor **T1**.



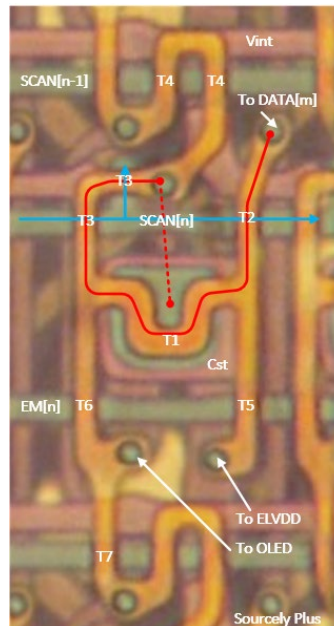
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



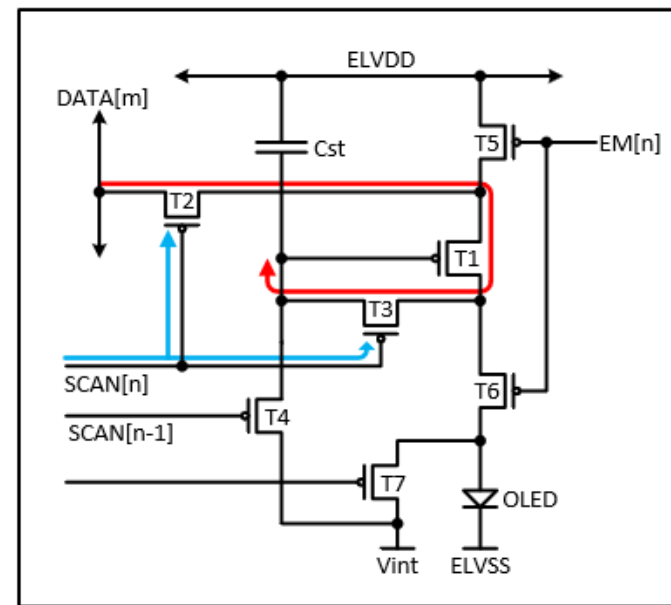
Sourcely Plus Equivalent Circuit

7[b] a second transistor for programming the data signal voltage and for generating a driving current in response to a programmed data signal when light is emitted;

The pixel circuit of the Sourcely Plus Product has a second transistor for programming the data signal voltage and for generating a driving current in response to a programmed data signal when light is emitted. As shown in the annotated circuit diagram below, the second transistor **T1** is coupled to a power supply voltage **ELVDD**. As described for claim element **1[a]** above, the first transistor **T2** delivers a data signal voltage in response to an active (low) current scan line signal that is delivered on scan line **SCAN[n]**. The data signal voltage is stored (programmed) on the capacitor **Cst**. When light is emitted, the second transistor **T1** will generate a driving current dependent upon the voltage stored on the capacitor **Cst**, and the current will be sourced from **ELVDD**.



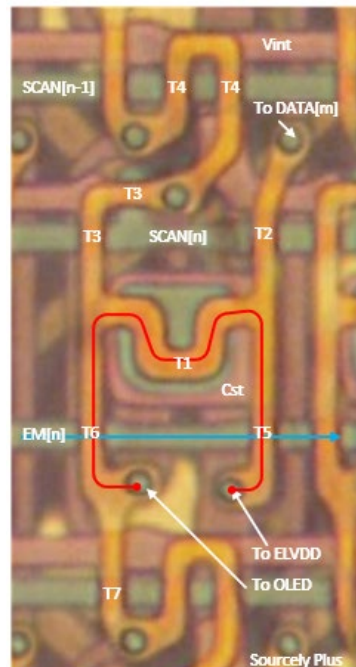
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



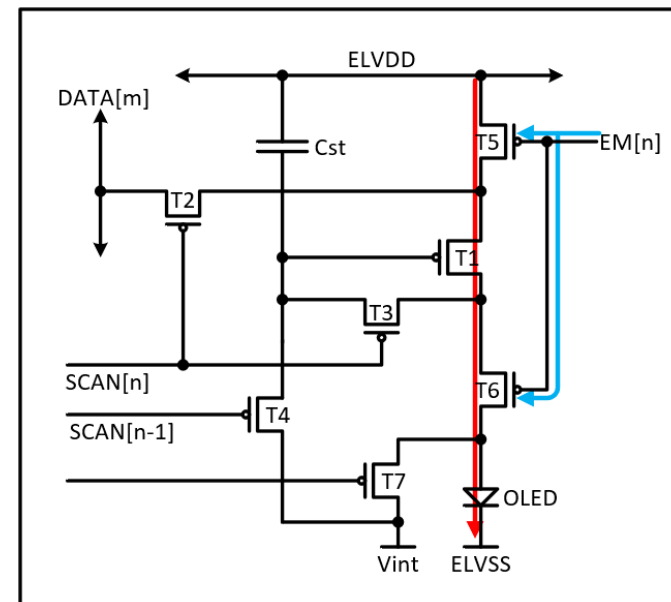
Sourcely Plus Equivalent Circuit

7[b] a second transistor for programming the data signal voltage and for generating a driving current in response to a programmed data signal when light is emitted;
(cont'd)

As further reflected in the annotated circuit diagram below, in response to an active (low) current light-emitting signal (blue line) delivered on emission line **EM[n]**, transistors **T5** and **T6** turn on, and a driving current (red line) flows from **ELVDD** through second transistor **T1** to the **OLED**. The amount of current that flows through second transistor **T1** to the **OLED** is dependent upon the voltage that was stored on (programmed) the capacitor **Cst**, which is based on the data signal voltage delivered previously through first transistor **T2** (see claim element **7[d]**, below).



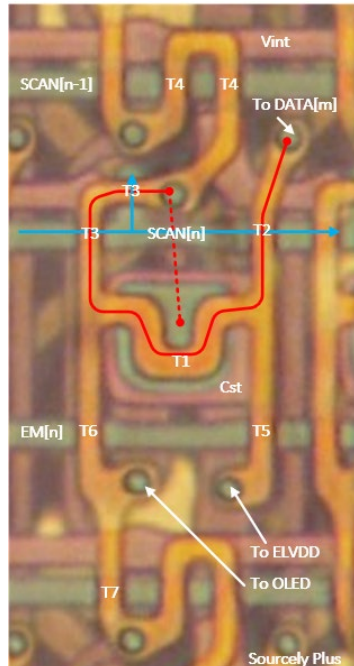
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



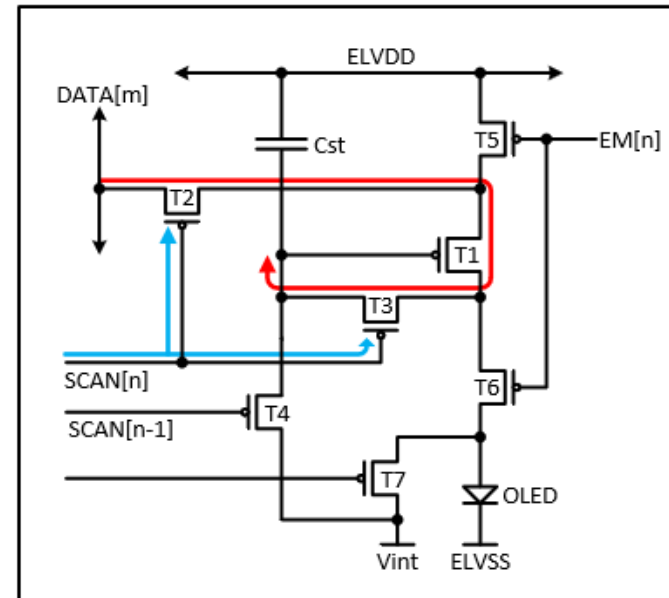
Sourcely Plus Equivalent Circuit

7[c] a third transistor for providing the data signal voltage for the second transistor in response to the current scan signal;
(cont'd)

As reflected in the annotated circuit diagram below, in response to an active (low) current scan line signal (blue line) delivered on scan line **SCAN[n]**, transistors **T2** and **T3** turn on and a data signal voltage (red line) on data line **DATA[m]** flows through transistors **T2-T1-T3** and is stored on the capacitor **Cst** and the gate of second transistor **T1**.



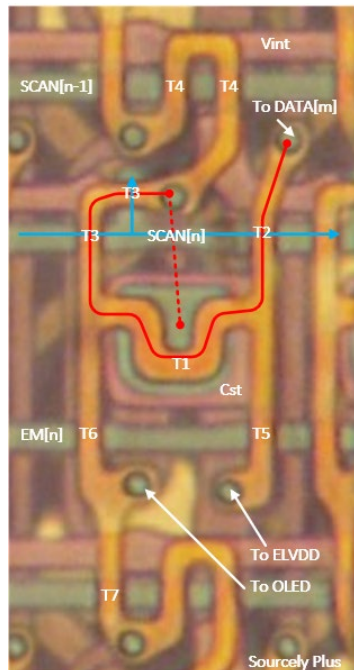
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



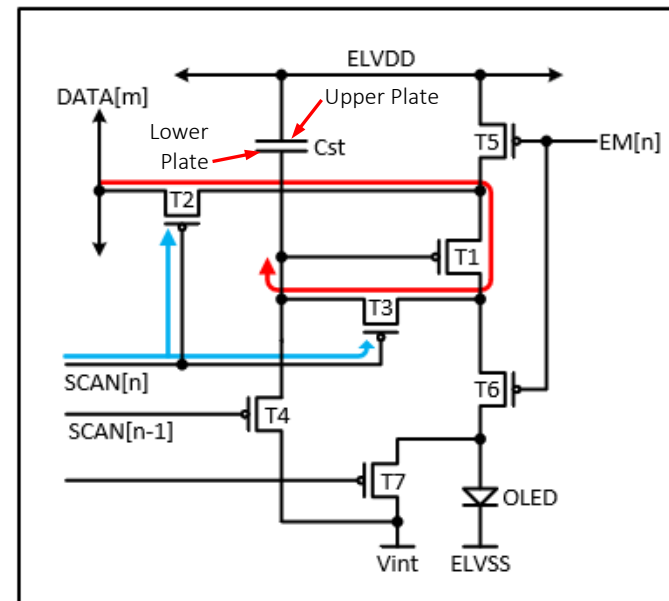
Sourcely Plus Equivalent Circuit

7[d] a capacitor for maintaining the data signal voltage programmed onto the second transistor;

The pixel circuit of the Sourcely Plus Product has a capacitor for maintaining the data signal voltage programmed onto the second transistor. As shown in the annotated circuit diagram below, the capacitor **Cst** has an upper plate and a lower plate. The capacitor **Cst** maintains the data signal voltage delivered to and stored (programmed) on the gate of the second transistor **T1**. In response to an active (low) current scan line signal (blue line) delivered on scan line **GW[N]**, first transistor **T2** delivers the data signal voltage (red line) on data line **Data** to second transistor **T1** and to capacitor **Cst** (see also claim elements **7[a]**, **7[b]** above).



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



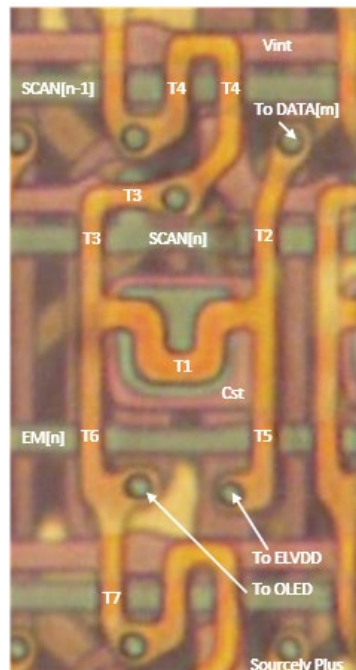
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

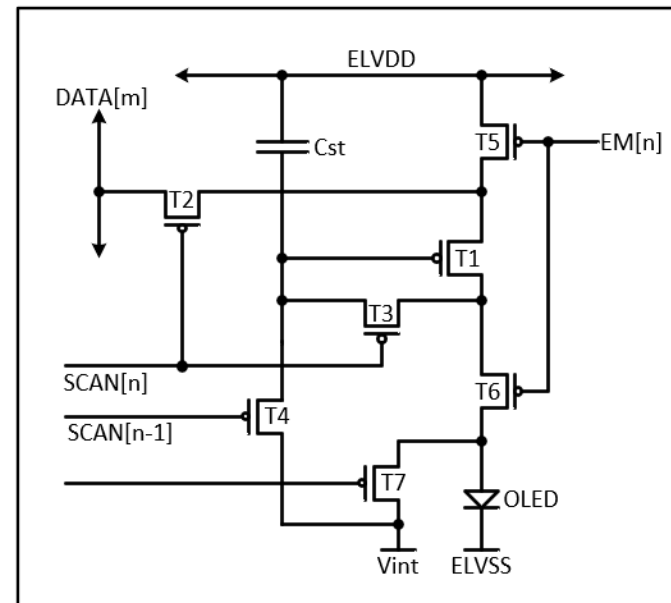
7[e] a fourth transistor for delivering a power supply voltage to the second transistor when the light is emitted;

Sourcely Plus Product

The pixel circuit of the Sourcely Plus Product has a fourth transistor for delivering a power supply voltage to the second transistor when the light is emitted. As shown in the circuit diagram below, the fourth transistor **T5** is coupled to a power supply voltage **ELVDD** and second transistor **T1**. In response to an active (low) current light-emitting signal delivered on emission line **EM[n]**, fourth transistor **T5** delivers a power supply voltage from **ELVDD** to second transistor **T1** when the light is emitted.



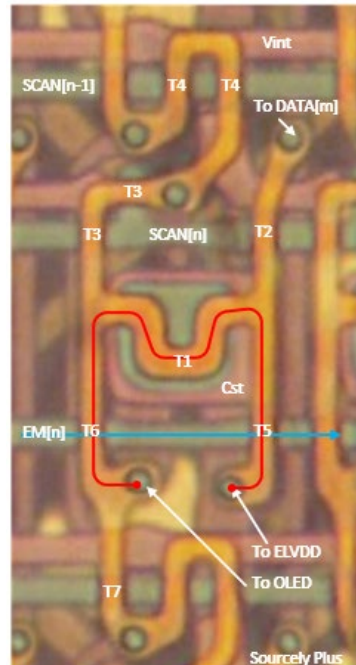
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



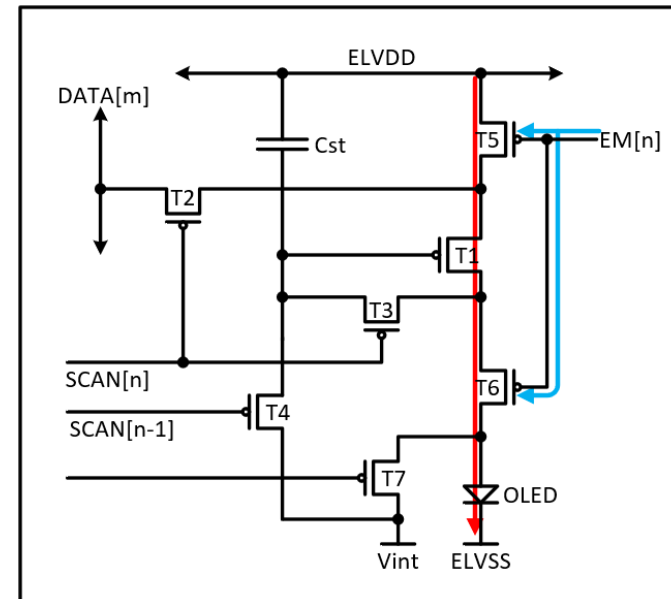
Sourcely Plus Equivalent Circuit

7[e] a fourth transistor for delivering a power supply voltage to the second transistor when the light is emitted;
(cont'd)

For example, as shown in the annotated circuit diagram below, in response to an active (low) current light-emitting signal (blue line) delivered on emission line **EM[n]**, fourth transistor **T5** turns on and provides a power supply voltage **ELVDD** (red line) to second transistor **T1** when the light is emitted.



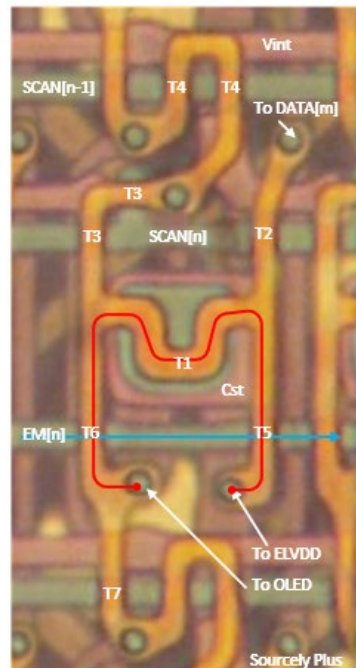
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



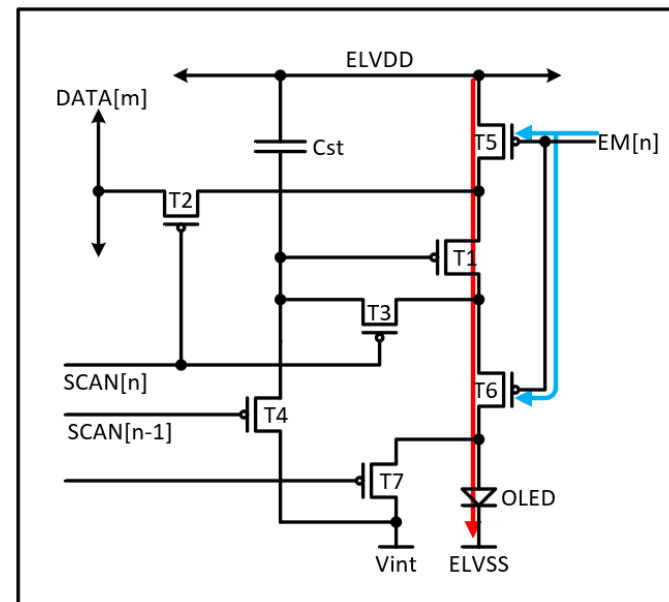
Sourcely Plus Equivalent Circuit

7[f] a fifth transistor for delivering the driving current, provided from the second transistor, in response to the data signal voltage when the light is emitted; and
(cont'd)

As is further shown in the annotated circuit diagram below, fifth transistor **T6** is coupled in series between second transistor **T1** and the **OLED**. In response to an active (low) current light-emitting signal (blue line) delivered on emission line **EM[n]**, fifth transistor **T6** turns on, and the driving current flows (red line) from second transistor **T1** through fifth transistor **T6** to the **OLED** when the light is emitted.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



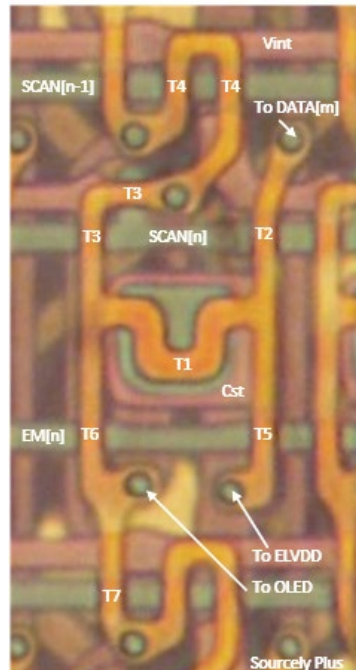
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

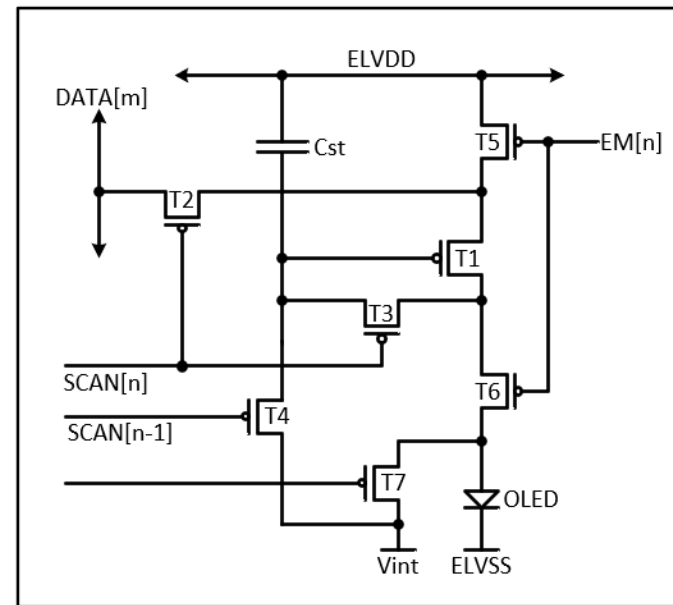
7[g] an electroluminescent element for emitting light corresponding to the driving current delivered through the fifth transistor,

Sourcely Plus Product

The pixel circuit of the Sourcely Plus Product has an electroluminescent element for emitting light corresponding to the driving current delivered through the fifth transistor. As shown in the circuit diagram below, the driving current flows from a power supply voltage **ELVDD** through fourth transistor **T5**, through second transistor **T1**, and through fifth transistor **T6** to the **OLED**. The amount of light emitted from the **OLED** corresponds to the driving current generated by second transistor **T1** and delivered through the fifth transistor **T6**.



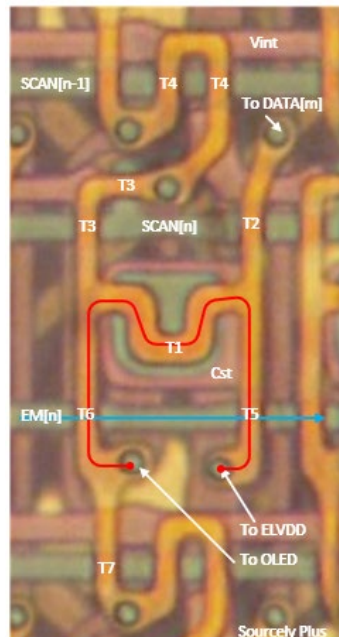
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



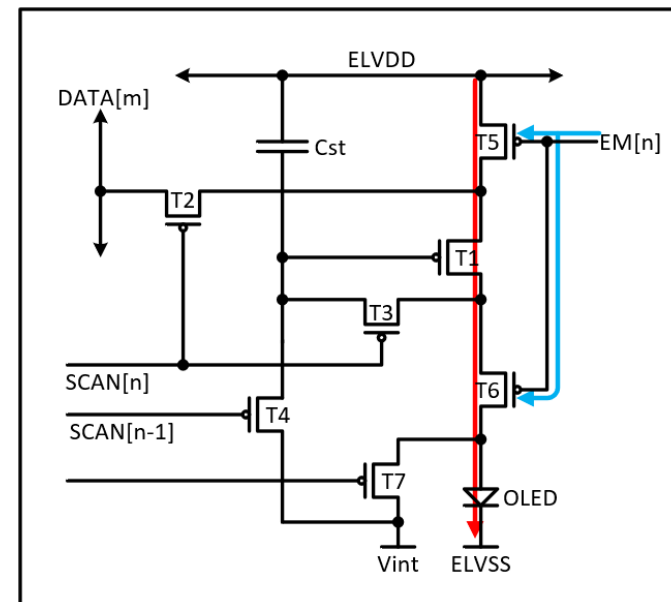
Sourcely Plus Equivalent Circuit

7[g] an electroluminescent element for emitting light corresponding to the driving current delivered through the fifth transistor, (cont'd)

As is reflected in the annotated circuit diagram below, in response to an active (low) current light-emitting signal (blue line) delivered on emission line **EM[n]**, transistors **T5** and **T6** turn on, and current (red line) can flow from **ELVDD** through transistors **T5-T1-T6** to the **OLED**. The voltage stored by capacitor **Cst** (see also claim element **7[d]**, above) is applied to the gate of second transistor **T1**, and this applied voltage determines the amount of driving current that flows through second transistor **T1** to the **OLED**, which in turn determines the amount of light emitted by the **OLED**.



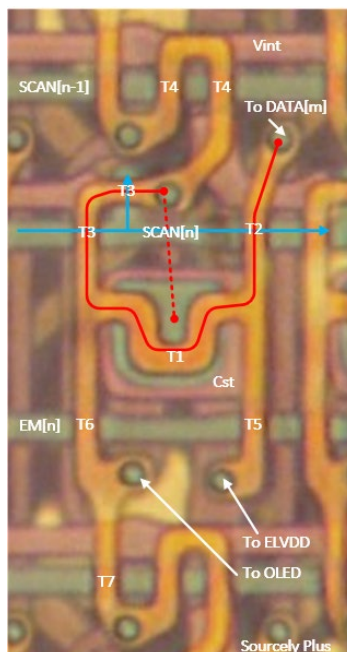
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



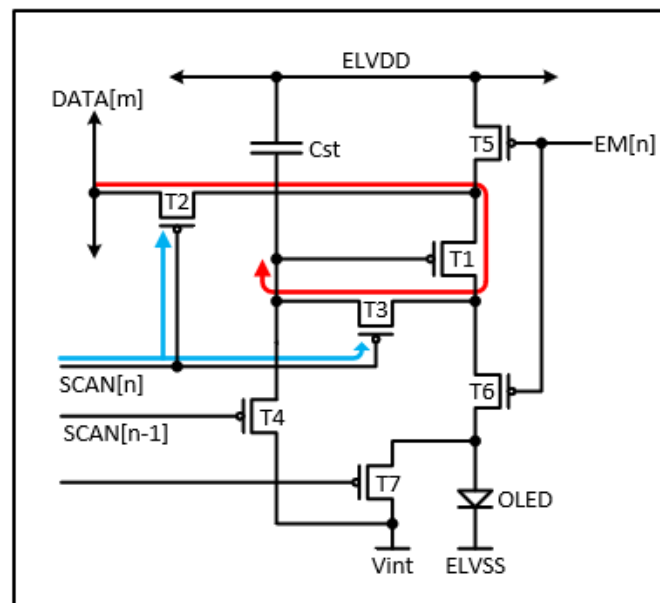
Sourcely Plus Equivalent Circuit

7[h] wherein the third transistor connects the second transistor in the form of a diode in response to the current scan signal so that the second transistor detects and compensates its threshold voltage deviation in itself.

In the pixel circuit of the Sourcely Plus Product, the third transistor connects the second transistor in the form of a diode in response to the current scan signal so that the second transistor detects and compensates its threshold voltage deviation in itself. For example, as shown in the annotated circuit diagram below, in response to a current scan signal (blue line) delivered on scan line **SCAN[n]** being active (low), the first transistor **T2** delivers the data signal voltage (red line) present on data line **DATA[m]** to the gate of the second transistor **T1** through the third transistor **T3**. The third transistor **T3** is connected between the drain and gate of second transistor **T1**. In response to an active (low) current scan line signal (blue line) delivered on scan line **SCAN[n]**, third transistor **T3** connects the drain and gate of second transistor **T1** together (red line), connecting second transistor **T1** in the form of a diode, so that the second transistor **T1** detects and compensates its threshold voltage deviation in itself.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

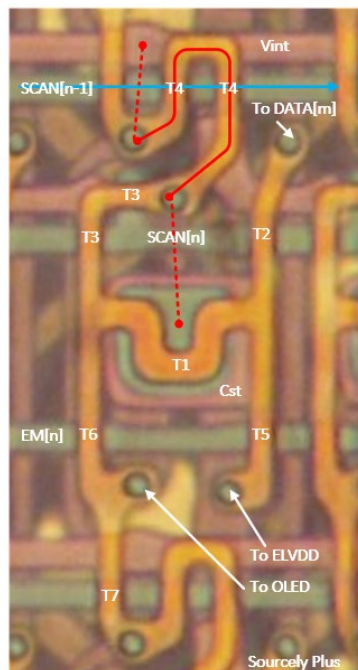
Sourcely Plus Product

8. The pixel circuit in the organic light emitting device of claim 7, further comprising:

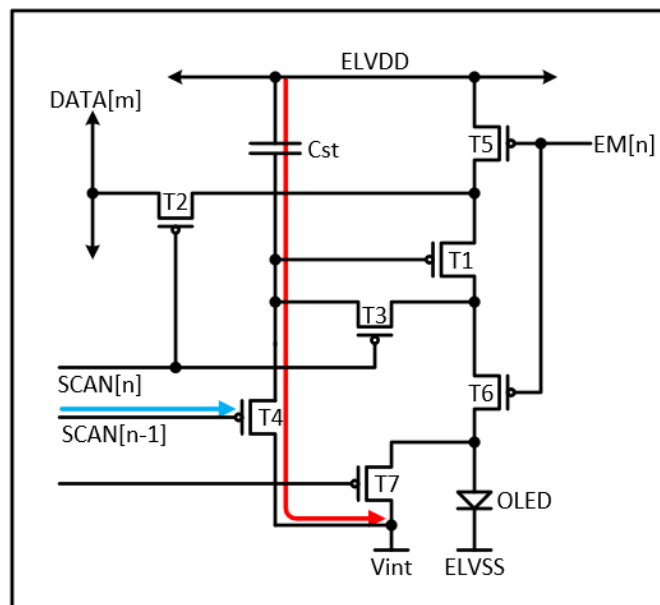
a sixth initialization transistor for discharging the data signal voltage stored in the capacitor in response to a scan signal just before the current scan signal upon initialization.

The pixel circuit of the Sourcely Plus Product has a sixth initialization transistor for discharging the data signal voltage stored in the capacitor in response to a scan signal just before the current scan signal upon initialization.

As shown in the annotated circuit diagram below, the sixth transistor **T4** is coupled between an initialization voltage line **Vint** and the capacitor **Cst**. The sixth transistor **T4** turns on in response to an active (low) scan signal (blue line) on scan line **GI[N]** that is a scan signal just before the current scan signal on scan line **GW[N]**. The data signal voltage stored in the capacitor **Cst** is discharged (red line) through sixth transistor **T4** to initialization voltage line **Vint**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



Sourcery Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

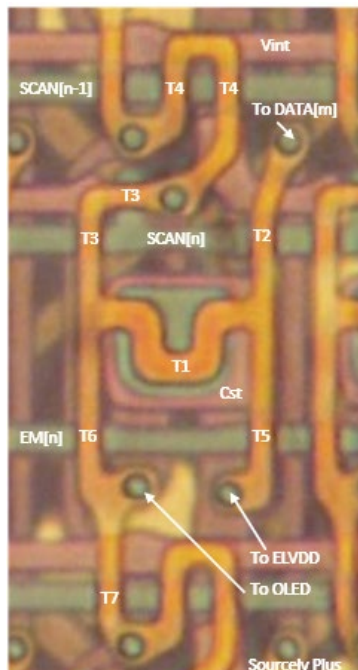
9. The pixel circuit in the organic light emitting device of claim 7, wherein the first transistor is composed of a PMOS transistor including a gate to which the current scan line signal is applied, a source to which the data signal voltage is applied, and a drain coupled to the second transistor.

Sourcely Plus Product

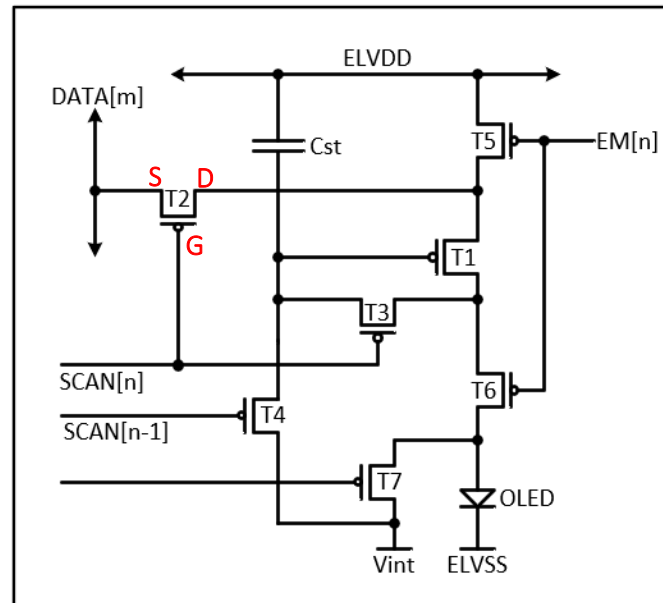
The pixel circuit of the Sourcely Plus Product has a first transistor composed of a PMOS transistor, including a gate to which the current scan line signal is applied, a source to which the data signal voltage is applied, and a drain coupled to the second transistor.

As shown in the annotated circuit diagram below, the circuit symbol for the first transistor **T2** indicates that it is a PMOS transistor.

As shown in the annotated circuit diagram below, the first transistor **T2** includes a gate to which the current scan line signal from scan line **SCAN[n]** is applied, a source to which the data signal voltage from data line **DATA[m]** is applied, and a drain coupled to the second transistor **T1**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



Sourcely Plus Equivalent Circuit

<p>U.S. Pat. No. 7,414,599</p>	<p>Sourcely Plus Product</p>
<p>10. The pixel circuit in the organic light emitting device of claim 7, wherein the second transistor is composed of a PMOS transistor including a gate coupled to one terminal of the capacitor, a source coupled to the first transistor, and a drain coupled to the electroluminescent element.</p>	<p>The pixel circuit of the Sourcely Plus Product has a second transistor composed of a PMOS transistor, including a gate coupled to one terminal of the capacitor, a source coupled to the first transistor, and a drain coupled to the electroluminescent element.</p> <p>As shown in the circuit diagram below, the circuit symbol for the second transistor T1 indicates that it is a PMOS transistor.</p> <p>As shown in the circuit diagram below, the second transistor T1 includes a gate coupled to one terminal of the capacitor Cst, a source coupled to the first transistor T2, and a drain coupled to the electroluminescent element through fifth transistor T6.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div data-bbox="697 643 1068 1297"> </div> <div data-bbox="1146 643 1818 1232"> </div> </div> <p style="text-align: center;">Sourcely Plus Equivalent Circuit</p>
	<p>Annotated Exhibit 2038 at 5 (Sourcely Plus Teardown Photos)</p>

U.S. Pat. No. 7,414,599	Sourcely Plus Product
<p>11. The pixel circuit in the organic light emitting device of claim 10, wherein the third transistor is composed of a PMOS transistor including a gate to which the current scan signal is applied, and a drain and a source which are coupled to the gate and the drain of the second transistor, respectively, so that the third transistor connects the second transistor in the form of a diode in response to the current scan signal to self-compensate a threshold voltage of the second transistor.</p>	<p>The pixel circuit of the Sourcely Plus Product has a third transistor composed of a PMOS transistor, including a gate, to which the current scan signal is applied, and a drain and a source that are coupled to the gate and the drain of the second transistor, respectively, so that the third transistor connects the second transistor in the form of a diode in response to the current scan signal to self-compensate a threshold voltage of the second transistor.</p> <p>As shown in the annotated circuit diagram below, the circuit symbol for the third transistor T3 indicates that it is a PMOS transistor. As shown in the annotated circuit diagram below, the third transistor T3 includes a gate to which the current scan signal delivered on scan line SCAN[n] is applied, a drain coupled to the gate of the second transistor T1, and source coupled to the drain of second transistor T1. In response to an active (low) current scan line signal (blue line) delivered on scan line SCAN[n], third transistor T3 connects the drain and gate of second transistor T1 together (red line), connecting second transistor T1 in the form of a diode to self-compensate a threshold voltage of second transistor T1.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div data-bbox="730 743 1054 1352" data-label="Image"> </div> <div data-bbox="1163 743 1822 1339" data-label="Diagram"> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div data-bbox="709 1356 1075 1453" data-label="Caption"> <p>Annotated Exhibit 2038 at 5 (Sourcely Plus Teardown Photos)</p> </div> <div data-bbox="1285 1344 1705 1377" data-label="Caption"> <p>Sourcely Plus Equivalent Circuit</p> </div> </div>

U.S. Pat. No. 7,414,599	Sourcely Plus Product
<p>13[a] The pixel circuit in the organic light emitting device of claim 7, wherein the fourth transistor is composed of a PMOS transistor including a gate to which the current light-emitting signal is applied, a source to which a power supply voltage is applied, and a drain coupled to the second transistor; and</p>	<p>The pixel circuit of the Sourcely Plus Product has a fourth transistor composed of a PMOS transistor, including a gate to which the current light-emitting signal is applied, a source to which a power supply voltage is applied, and a drain coupled to the second transistor.</p> <p>As shown in the annotated circuit diagram below, the circuit symbol for the fourth transistor T5 indicates that it is a PMOS transistor.</p> <p>As shown in the annotated circuit diagram below, the fourth transistor T5 includes a gate to which the current light-emitting signal is applied via emission line EM[n], a source coupled to the power supply voltage ELVDD, and a drain coupled to the second transistor T1.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div data-bbox="711 643 1068 1307" data-label="Image"> <p>This scanning electron micrograph (SEM) shows the physical layout of the pixel circuit. Labels include: SCAN[n-1], T4, Vint, To DATA[m], T3, T2, T1, Cst, EM[n], T6, T5, To ELVDD, To OLED, T7, and Sourcely Plus.</p> </div> <div data-bbox="1163 643 1827 1242" data-label="Diagram"> <p>This schematic diagram represents the equivalent circuit of the pixel. It shows a PMOS transistor T5 at the top with its source connected to ELVDD and its gate connected to the EM[n] emission line. Its drain is connected to the drain of PMOS transistor T1. T1's source is connected to the gate of PMOS transistor T2, which in turn is connected to the DATA[m] line. T2's source is connected to the gate of PMOS transistor T3. T3's source is connected to the gate of PMOS transistor T4, which is connected to the SCAN[n] line. T4's source is connected to the gate of PMOS transistor T6, which is connected to the SCAN[n-1] line. T6's source is connected to the gate of PMOS transistor T7, which is connected to the ELVSS line. A capacitor Cst is connected between the DATA[m] line and the gate of T2. An OLED diode is connected between the drain of T7 and the ELVSS line. The circuit is powered by Vint and ELVDD.</p> </div> </div> <p style="text-align: center;">Sourcely Plus Equivalent Circuit</p> <p>Annotated Exhibit 2038 at 5 (Sourcely Plus Teardown Photos)</p>

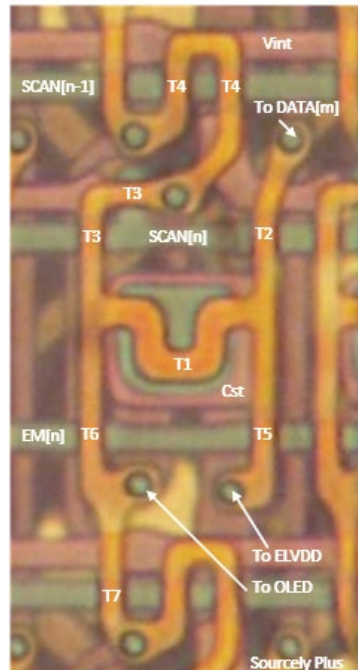
U.S. Pat. No. 7,414,599	Sourcely Plus Product
<p>13[b] the fifth transistor is composed of a PMOS transistor including a gate to which the current light-emitting signal is applied, a source coupled to the second transistor, and a drain coupled to the electroluminescent element.</p>	<p>The pixel circuit of the Sourcely Plus Product has a fifth transistor composed of a PMOS transistor, including a gate to which the current light-emitting signal is applied, a source coupled to the second transistor, and a drain coupled to the electroluminescent element.</p> <p>As shown in the annotated circuit diagram below, the circuit symbol for the fifth transistor T6 indicates that it is a PMOS transistor.</p> <p>As shown in the annotated circuit diagram below, the fifth transistor T6 includes a gate to which the current light-emitting signal is applied via emission line EM[n], a source coupled to the drain of T1, and a drain coupled to the electroluminescent element (OLED).</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div data-bbox="711 643 1068 1307" data-label="Image"> </div> <div data-bbox="1163 643 1827 1242" data-label="Diagram"> </div> </div> <p style="text-align: center;">Sourcely Plus Equivalent Circuit</p> <p>Annotated Exhibit 2038 at 5 (Sourcely Plus Teardown Photos)</p>

U.S. Pat. No. 7,414,599

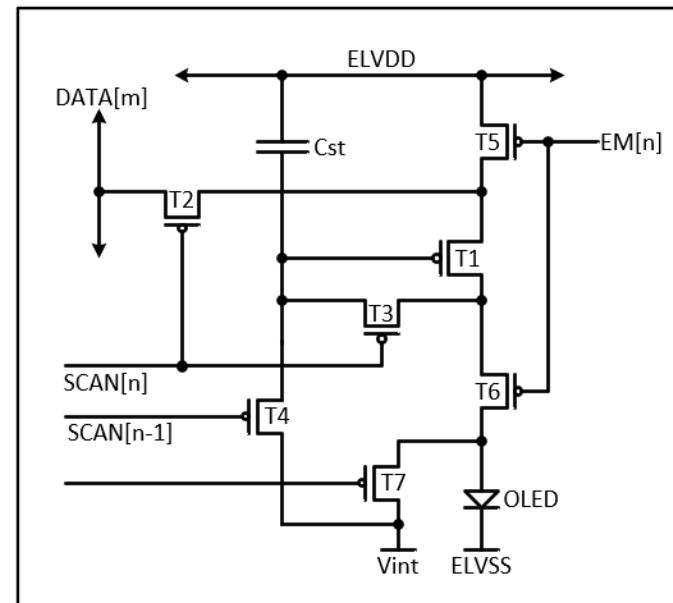
Sourcely Plus Product

14[preamble] A pixel circuit in an organic light emitting device, comprising:

The Sourcely Plus Product includes a pixel circuit in an organic light-emitting device. For example, the circuit diagram below of the Sourcely Plus 12Pro Soft OLED depicts the transistors **T1–T7**, the capacitor **Cst**, and the **OLED** element.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



Sourcely Plus Equivalent Circuit

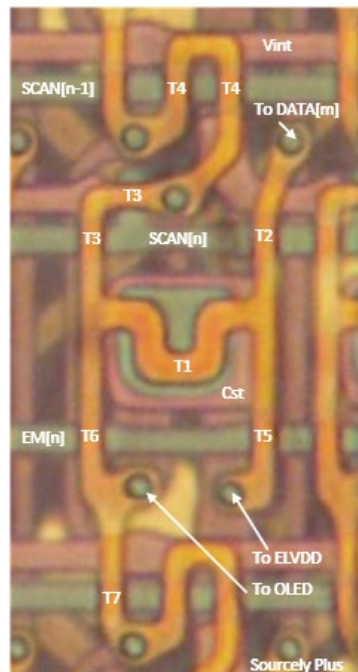
U.S. Pat. No. 7,414,599	Sourcely Plus Product
<p>14[preamble] A pixel circuit in an organic light emitting device, comprising:</p> <p>(cont'd)</p>	 <p>Exhibit 2038 Sourcely Plus Teardown Photos) at 1, 4</p>

U.S. Pat. No. 7,414,599

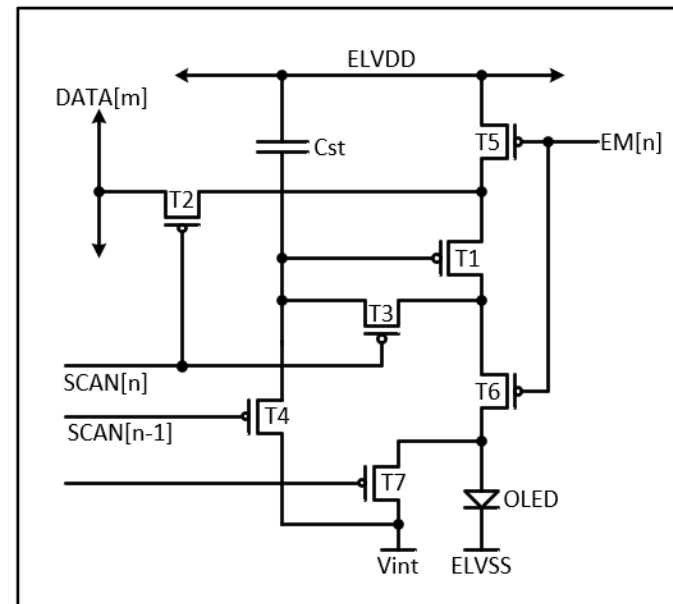
Sourcely Plus Product

14[a] an electroluminescent element for emitting light in response to an applied driving current;

The pixel circuit of the Sourcely Plus Product has an electroluminescent element for emitting light in response to an applied driving current. As shown in the circuit diagram below, the driving current flows from a power supply voltage **ELVDD** through a transistors **T5**, **T1**, and **T6**, respectively, to the electroluminescent element (**OLED**) to emit light. The light emitted by the **OLED** corresponds to the driving current generated through the second transistor **T1**.



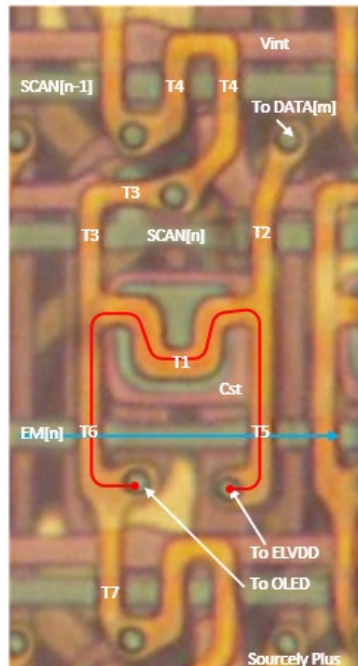
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



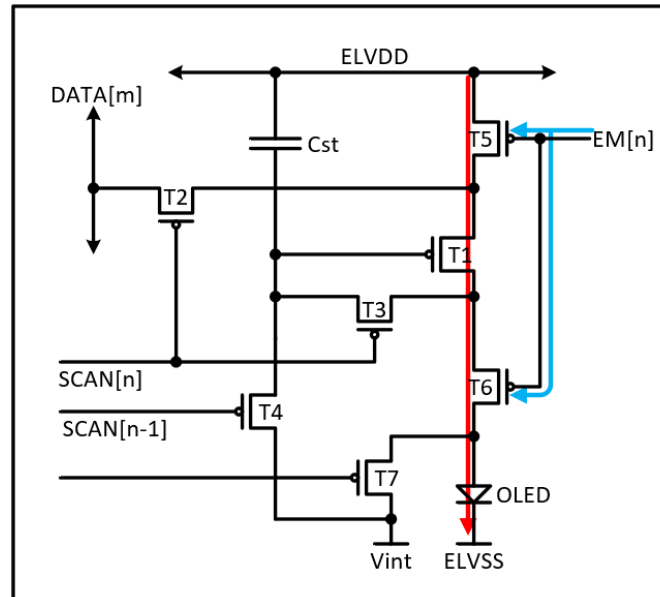
Sourcely Plus Equivalent Circuit

14[a] an electroluminescent element for emitting light in response to an applied driving current;
(*cont'd*)

As reflected in the annotated circuit diagram below, in response to an active (low) current light-emitting signal (blue line) delivered on emission line **EM[n]**, transistors **T5** and **T6** turn on and current (red line) flows from **ELVDD** through transistor **T1** to the **OLED**. The voltage stored by the capacitor **Cst** (see *also* claim element **14[e]**, below) is applied to the gate of transistor **T1**. As shown in the annotated circuit diagram below, the driving current flows from a power supply voltage **ELVDD** through transistor **T5**, through transistor **T1**, and through transistor **T6** to the **OLED**. The amount of light emitted from the **OLED** corresponds to the driving current generated by transistor **T1**.



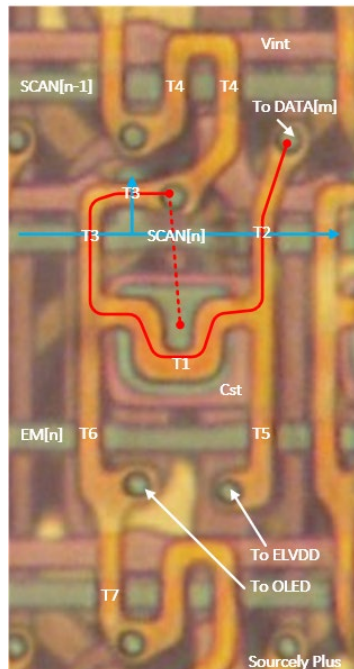
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



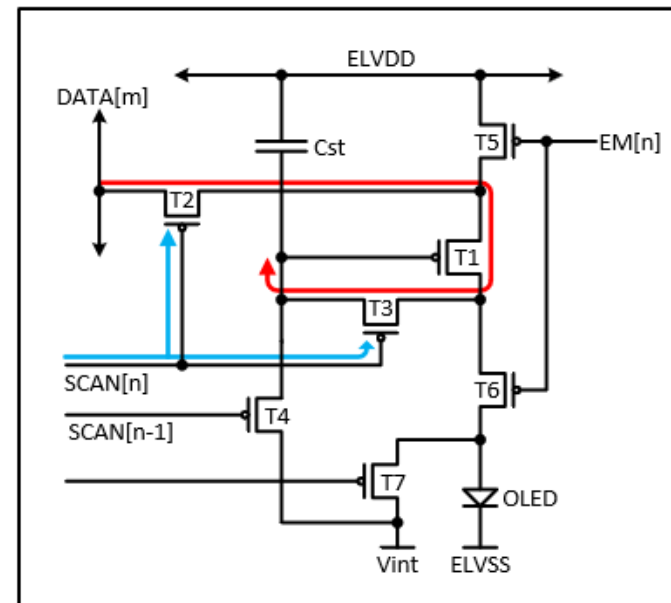
Sourcely Plus Equivalent Circuit

14[b] a first transistor for delivering a data signal voltage in response to a current scan line signal;
(cont'd)

As further shown in the annotated circuit diagram below, in response to an active (low) current scan line signal (blue line) delivered on scan line **SCAN[n]**, first transistor **T2** delivers the data signal voltage (red line) present on data line **DATA[m]**. The annotated circuit diagram below depicts an exemplary voltage path from data line **DATA[m]** through transistors **T2-T1-T3** to the gate of transistor **T1**.



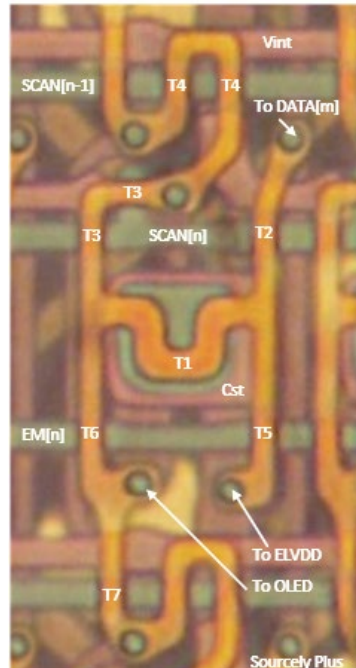
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



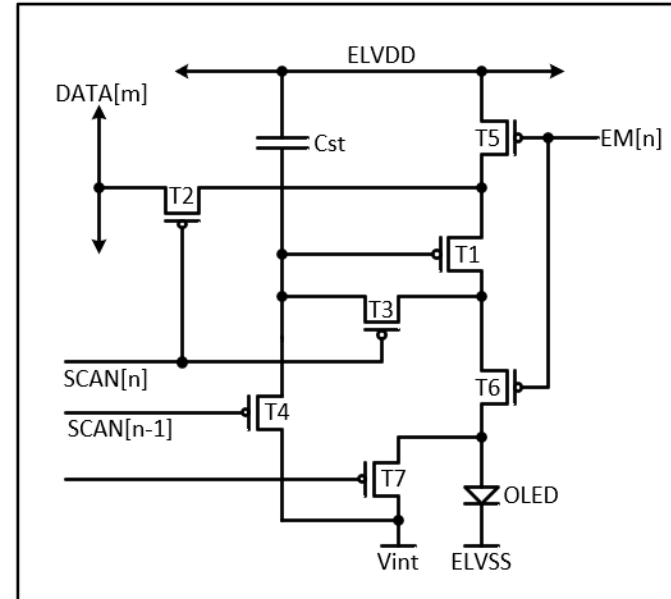
Sourcely Plus Equivalent Circuit

14[c] a second transistor for generating a driving current to drive the electroluminescent element in response to the data signal voltage;

The pixel circuit of the Sourcely Plus Product has a second transistor for generating a driving current to drive the electroluminescent element in response to the data signal voltage. As shown in the circuit diagram below, the second transistor **T1** is coupled to a power supply voltage **ELVDD**. As described for claim element **1[a]** above, the first transistor **T2** delivers a data signal voltage in response to an active (low) current scan line signal that is delivered on scan line **SCAN[n]**. The data signal voltage is stored on the capacitor **Cst**. The second transistor **T1** will generate a driving current in response to the voltage stored on the capacitor **Cst**, and the current will be sourced from **ELVDD**.



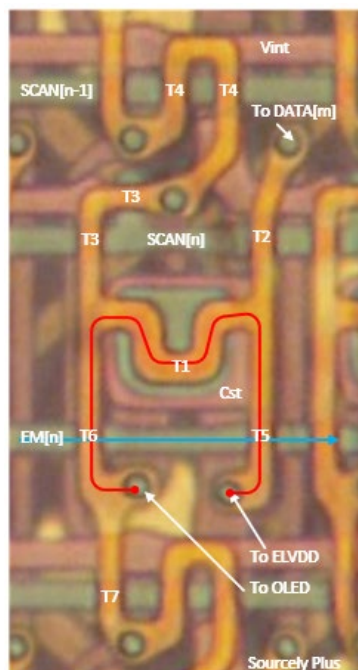
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



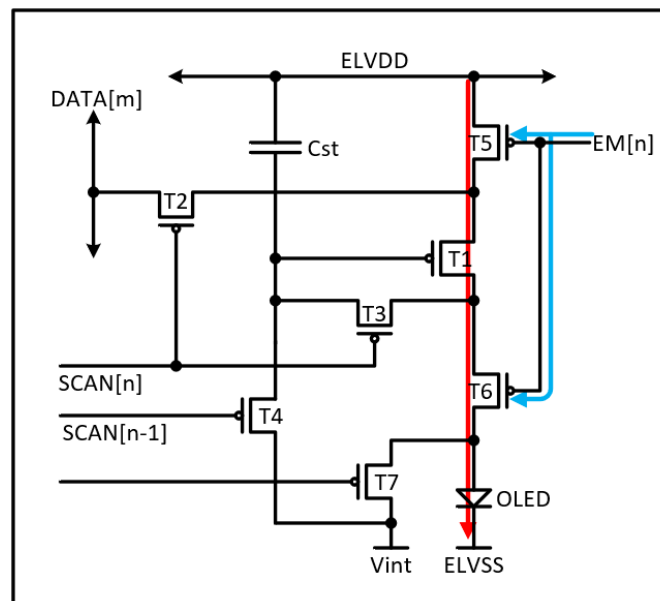
Sourcely Plus Equivalent Circuit

14[c] a second transistor for generating a driving current to drive the electroluminescent element in response to the data signal voltage;
(*cont'd*)

For example, as shown in the annotated circuit diagram below, in response to an active (low) current light-emitting signal (blue line) delivered on emission line **EM[n]**, transistors **T5** and **T6** turn on, and a driving current (red line) flows from **ELVDD** through second transistor **T1** to the **OLED**. The amount of current that flows through second transistor **T1** to the **OLED** is dependent upon the voltage that was stored on the capacitor **Cst**, which is based on the data signal voltage delivered previously through first transistor **T2** (see *also* claim element **14[b]**, above).



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)

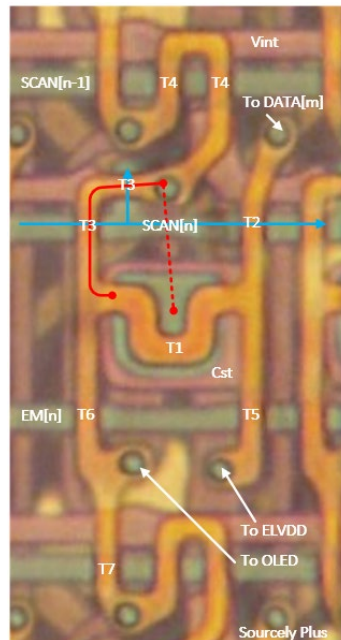


Sourcely Plus Equivalent Circuit

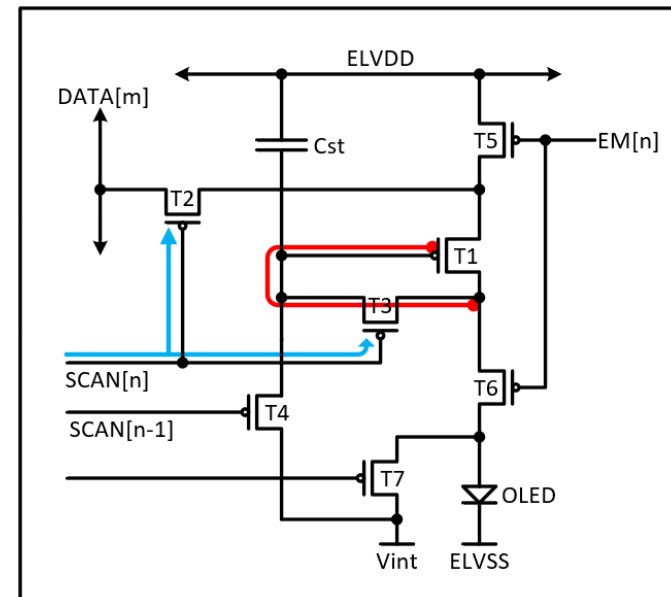
14[d] a third transistor for connecting the second transistor in the form of a diode in response to the current scan signal to self-compensate a threshold voltage of the second transistor;

The pixel circuit of the Sourcely Plus Product has a third transistor for connecting the second transistor in the form of a diode in response to the current scan signal to self-compensate a threshold voltage of the second transistor. As shown in the annotated circuit diagram below, a third transistor **T3** connects the gate and drain of the second transistor **T1**, connecting the second transistor **T1** in the form of a diode in response to the current scan signal to self-compensate a threshold voltage of the second transistor **T1**.

Third transistor **T3** is connected between the gate and the drain of second transistor **T1**. In response to an active (low) current scan line signal (blue line) delivered on scan line **GW[N]**, third transistor **T3** connects the drain and gate of second transistor **T1** together (red line), connecting second transistor **T1** in the form of a diode to self-compensate a threshold voltage of second transistor **T1**.



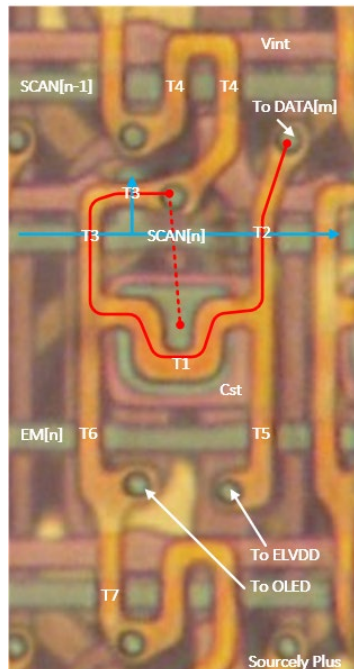
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



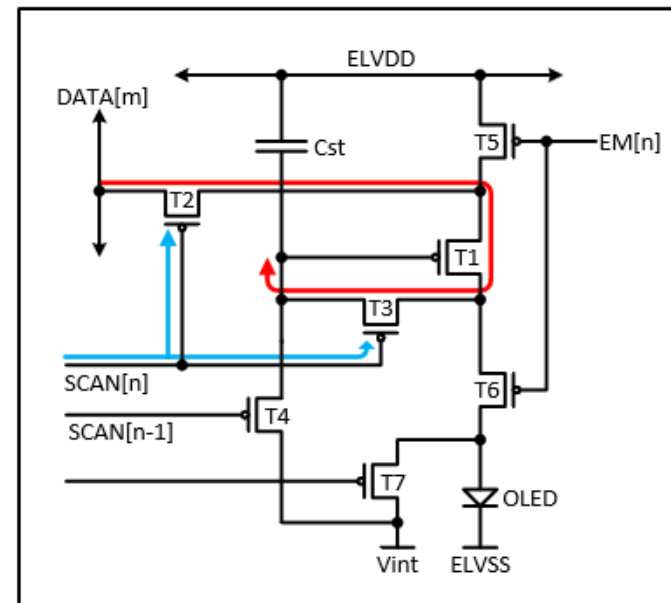
Sourcely Plus Equivalent Circuit

14[d] a third transistor for connecting the second transistor in the form of a diode in response to the current scan signal to self-compensate a threshold voltage of the second transistor;
(cont'd)

As reflected in the annotated circuit diagram below, in response to an active (low) current scan line signal (blue line) delivered on scan line **SCAN[n]**, transistors **T2** and **T3** turn on and a data signal voltage (red line) on data line **DATA[m]** flows through transistors **T2-T1-T3** and is stored on the capacitor **Cst**. This arrangement allows for the detection and self-compensation of the threshold voltage deviation in second transistor **T1**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



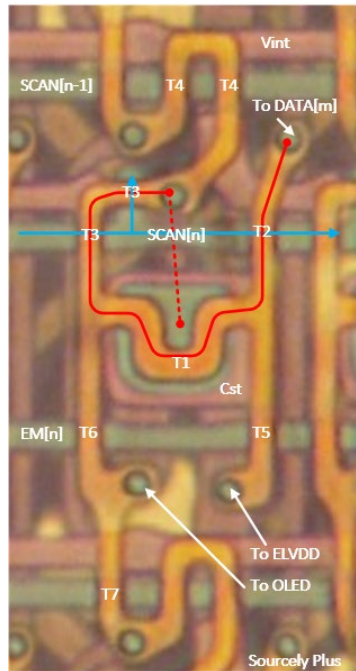
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

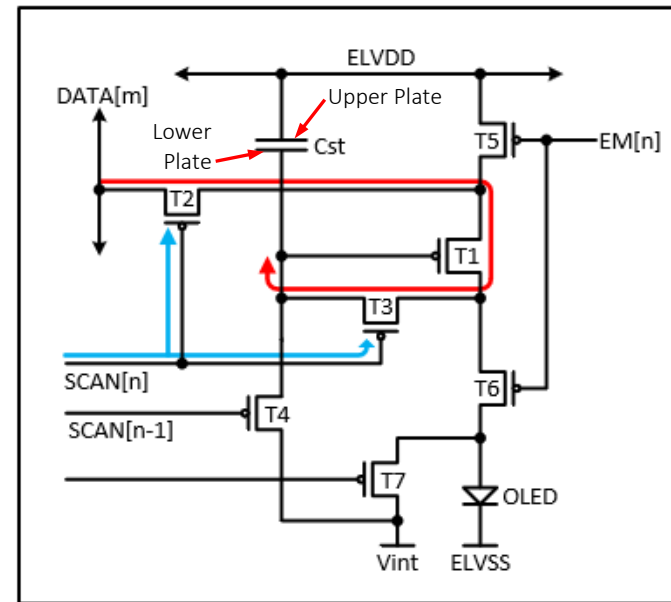
14[e] a capacitor for storing the data signal voltage delivered to the second transistor;

Sourcely Plus Product

The pixel circuit of the Sourcely Plus Product has a capacitor for storing the data signal voltage delivered to the second transistor. As shown in the annotated circuit diagram below, the capacitor **Cst** has an upper plate and a lower plate. The capacitor **Cst** stores the data signal voltage delivered to the second transistor **T1**. In response to an active (low) current scan line signal (blue line) delivered on scan line **GW[N]**, first transistor **T2** delivers the data signal voltage (red line) on data line **Data** to second transistor **T1** and to capacitor **Cst** (see *a/so* claim elements **14[b]**, **14[c]**, above).



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



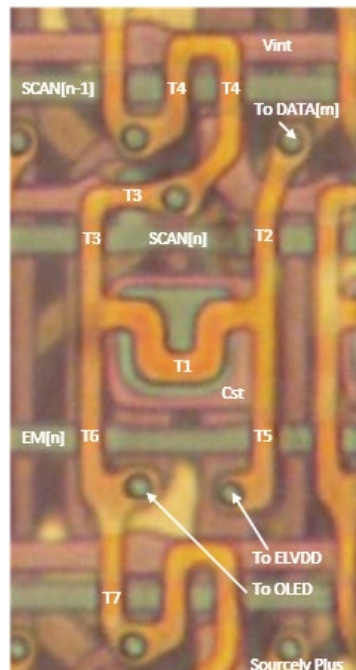
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

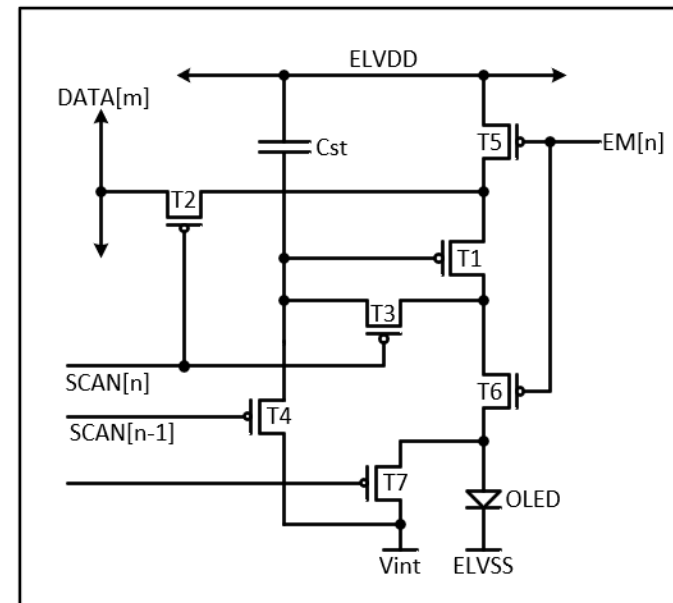
14[f] a fourth transistor for delivering a power supply voltage to the second transistor in response to a current light-emitting signal; and

Sourcely Plus Product

The pixel circuit of the Sourcely Plus Product has a fourth transistor for delivering a power supply voltage to the second transistor in response to a current light-emitting signal. As shown in the circuit diagram below, the fourth transistor **T5** is coupled to a power supply voltage **ELVDD** and second transistor **T1**. In response to an active (low) current light-emitting signal delivered on emission line **EM[n]**, fourth transistor **T5** delivers a power supply voltage from **ELVDD** to second transistor **T1**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



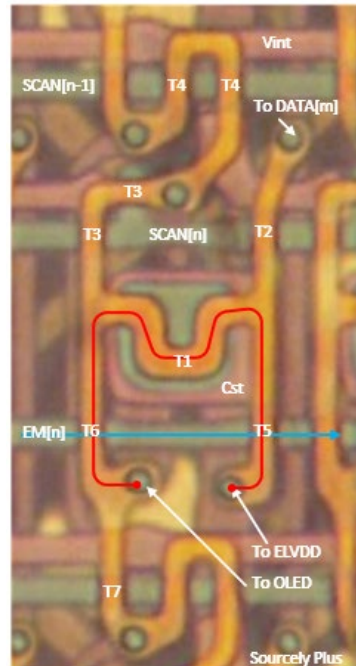
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

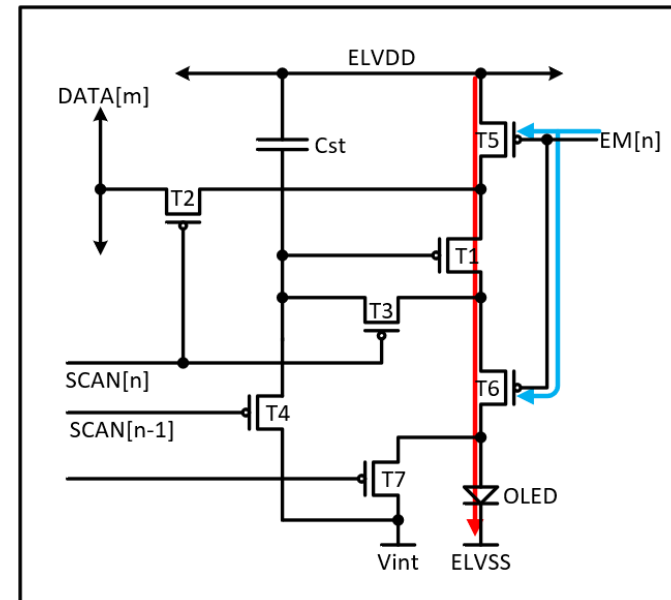
14[f] a fourth transistor for delivering a power supply voltage to the second transistor in response to a current light-emitting signal; and
(cont'd)

Sourcely Plus Product

As reflected in the annotated circuit diagram below, in response to an active (low) current light-emitting signal (blue line) delivered on emission line **EM[n]**, fourth transistor **T5** turns on and provides a power supply voltage **ELVDD** (red line) to second transistor **T1**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



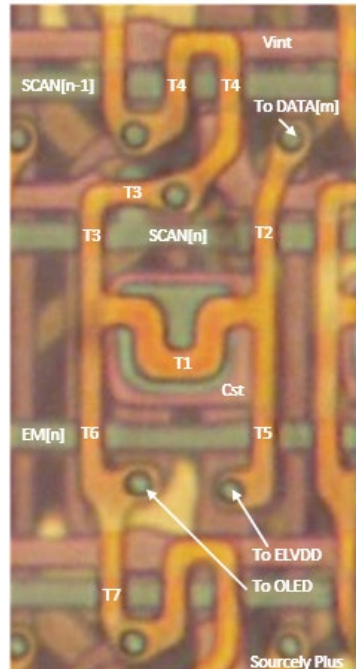
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

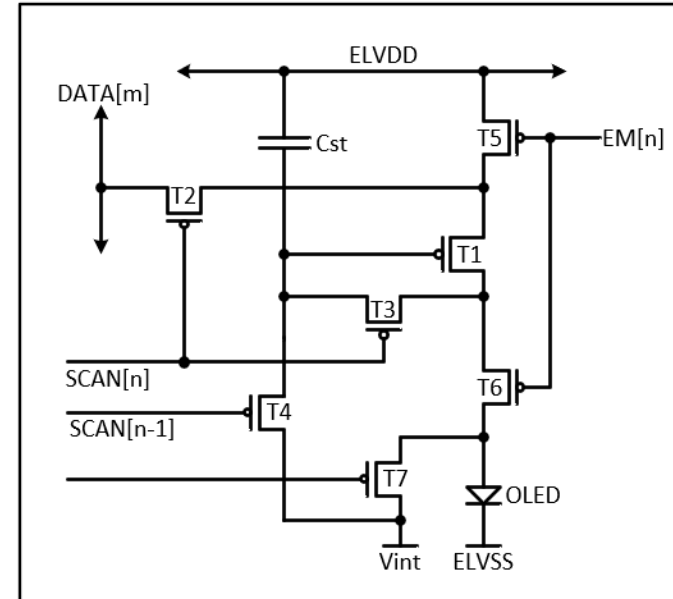
14[g] a fifth transistor for providing the driving current, provided from the second transistor, for the electroluminescent element in response to the current light-emitting signal.

Sourcely Plus Product

The pixel circuit of the Sourcely Plus Product has a fifth transistor for providing the driving current, provided from the second transistor, for the electroluminescent element in response to the current light-emitting signal. As shown in the circuit diagram below, the fifth transistor **T6** is coupled to the second transistor **T1** and to an electroluminescent element (**OLED**). As shown in the circuit diagram below, **fifth transistor T6** is in series between second transistor **T1** and the **OLED**. In response to an active (low) current light-emitting signal delivered on emission line **EM[n]**, fifth transistor **T6** turns on and provides driving current that flows through second transistor **T1** to the **OLED**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



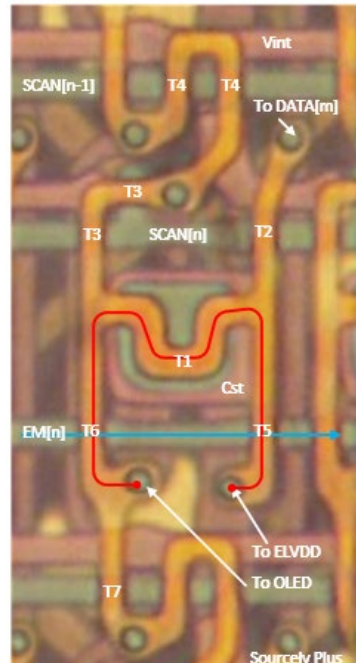
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

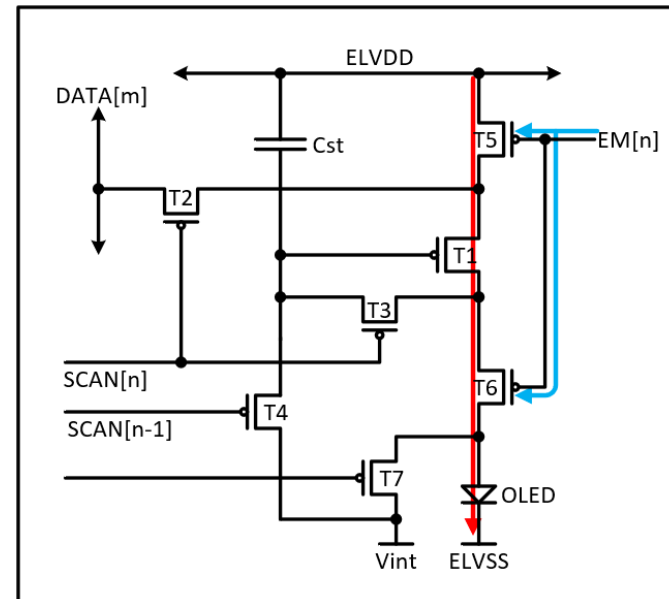
14[g] a fifth transistor for providing the driving current, provided from the second transistor, for the electroluminescent element in response to the current light-emitting signal.
(cont'd)

Sourcely Plus Product

As shown in the annotated circuit diagram below, fifth transistor **T6** is coupled in series between second transistor **T1** and the **OLED**. In response to an active (low) current light-emitting signal (blue line) delivered on emission line **EM[n]**, fifth transistor **T6** turns on, and the driving current flows (red line) from second transistor **T1** through fifth transistor **T6** to the **OLED**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



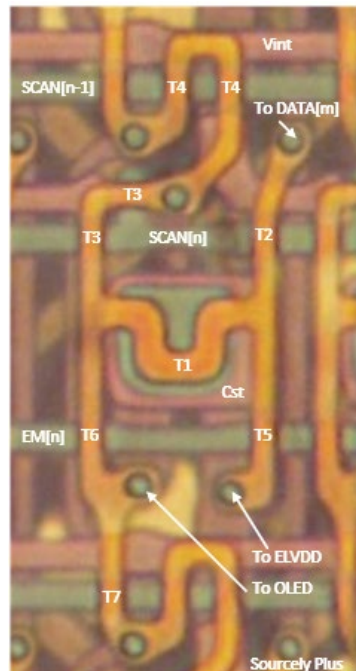
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

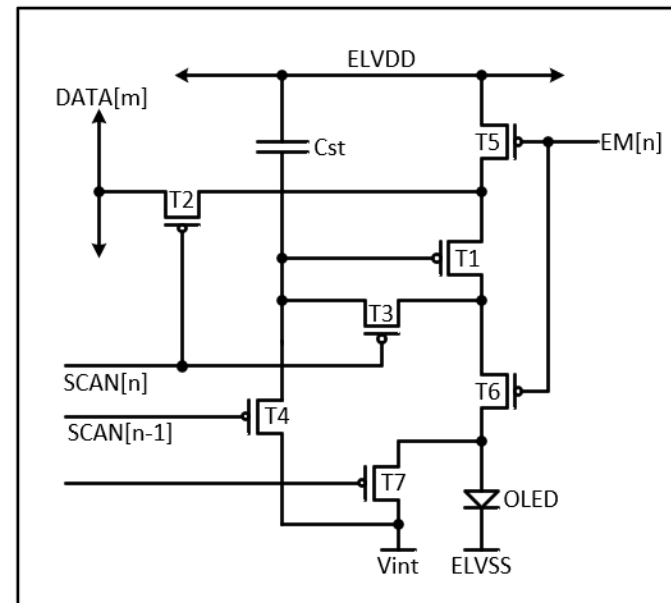
Sourcely Plus Product

15[preamble] A pixel circuit in an organic light emitting device, comprising:

The Sourcely Plus Product includes a pixel circuit in an organic light-emitting device. For example, the circuit diagram below of the Sourcely Plus 12Pro Soft OLED depicts the transistors **T1–T7**, the capacitor **Cst**, and the **OLED** element.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)

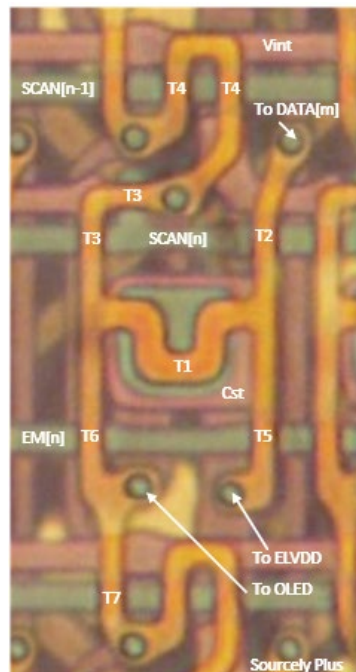


Sourcely Plus Equivalent Circuit

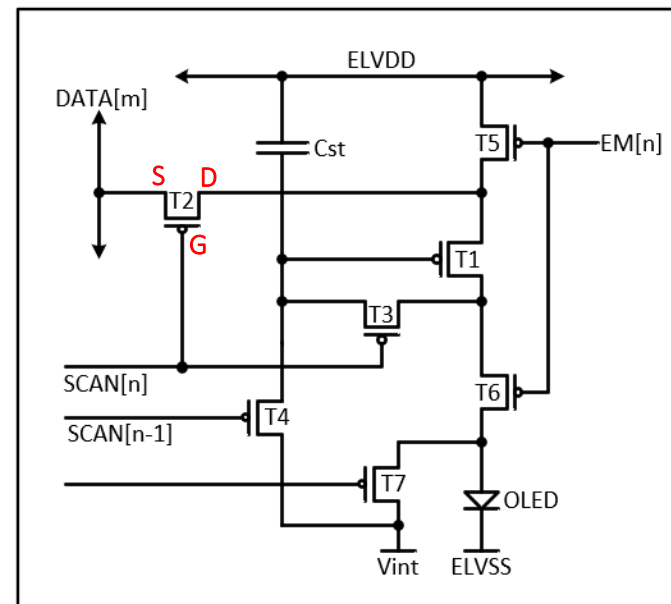
U.S. Pat. No. 7,414,599	Sourcely Plus Product
<p>15[preamble] A pixel circuit in an organic light emitting device, comprising:</p> <p>(cont'd)</p>	 <p>Exhibit 2038 Sourcely Plus Teardown Photos) at 1, 4</p>

15[a] a first transistor including a gate to which a current scan signal is applied, and a source to which a data signal voltage is applied;

The pixel circuit of the Sourcely Plus Product has a first transistor including a gate to which a current scan signal is applied, and a source to which a data signal voltage is applied. As shown in the circuit diagram below, the first transistor **T2** is coupled to a data line **DATA[m]** for delivering a data signal voltage. The gate of first transistor **T2** is coupled to a scan line **SCAN[n]** that delivers a current scan line signal to the gate of first transistor **T2**. A data signal voltage from data line **Data** is applied to the source of first transistor **T2**.



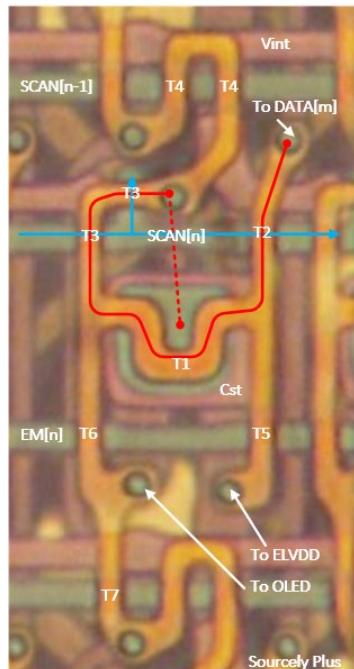
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



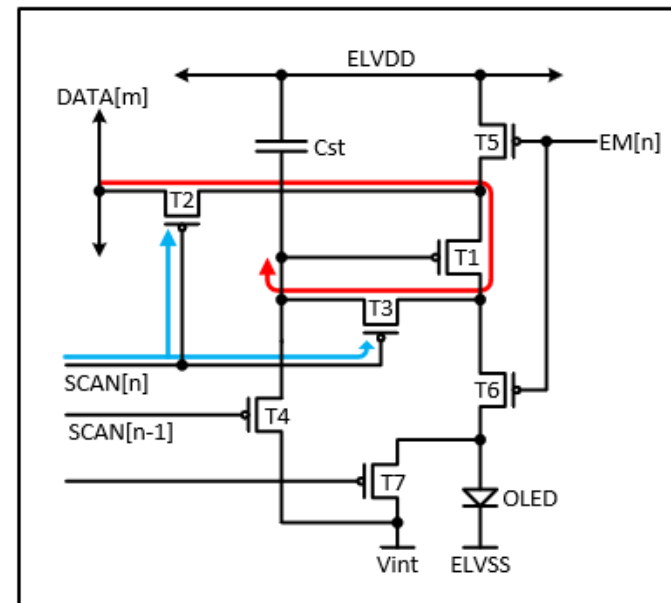
Sourcely Plus Equivalent Circuit

15[a] a first transistor including a gate to which a current scan signal is applied, and a source to which a data signal voltage is applied;
(cont'd)

As reflected in the annotated circuit diagram below, in response to an active (low) current scan line signal (blue line) delivered on scan line **SCAN[n]**, first transistor **T2** delivers the data signal voltage (red line) present on data line **DATA[m]**. The annotated circuit diagram below depicts an exemplary voltage path from data line **DATA[m]** through transistors **T2-T1-T3** to the gate of transistor **T1**.



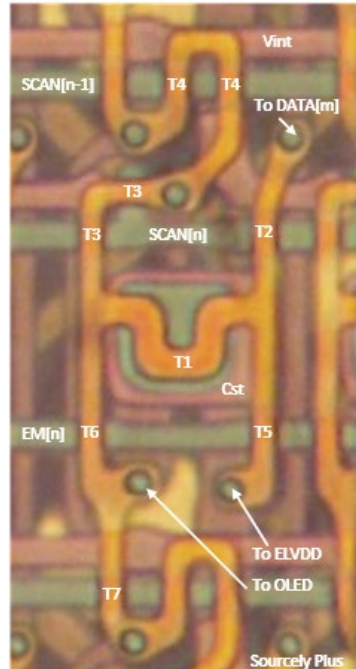
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



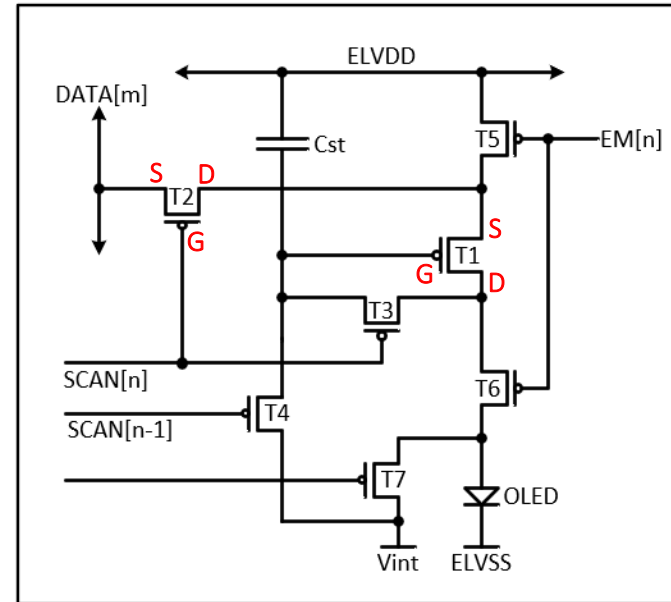
Sourcely Plus Equivalent Circuit

15[b] a second transistor whose source is coupled to a drain of the first transistor;

The pixel circuit of the Sourcely Plus Product has a second transistor whose source is coupled to a drain of the first transistor. As shown in the annotated circuit diagram below, the source of the second transistor **T1** is coupled to the drain of the first transistor **T2**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



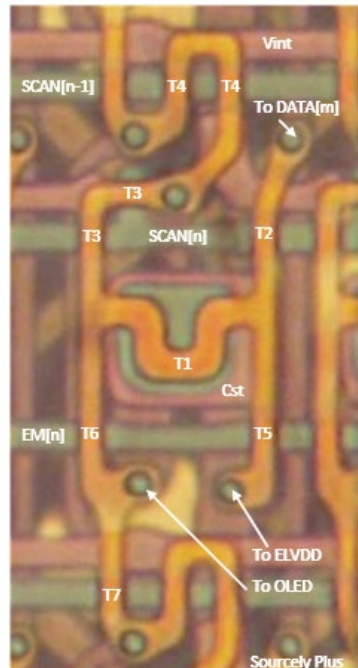
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

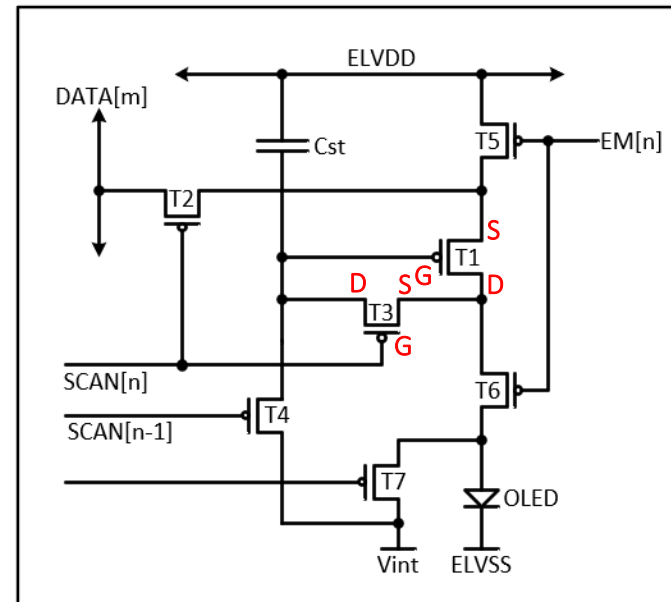
15[c] a third transistor whose drain and source are connected between a gate and a drain of the second transistor;

Sourcely Plus Product

The pixel circuit of the Sourcely Plus Product has a third transistor whose drain and source are connected between a gate and a drain of the second transistor. As shown in the annotated circuit diagram below, a third transistor **T3** has its drain and source connected between gate and drain of the second transistor **T1**, respectively.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



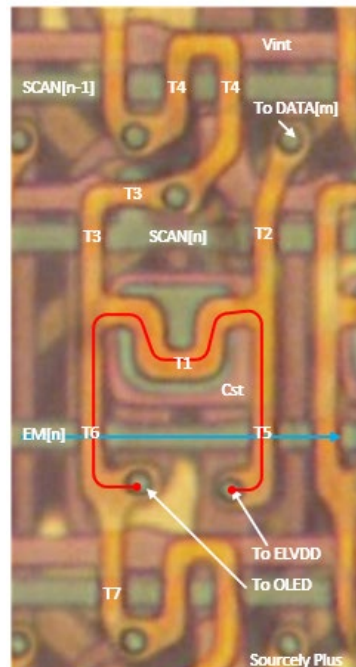
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

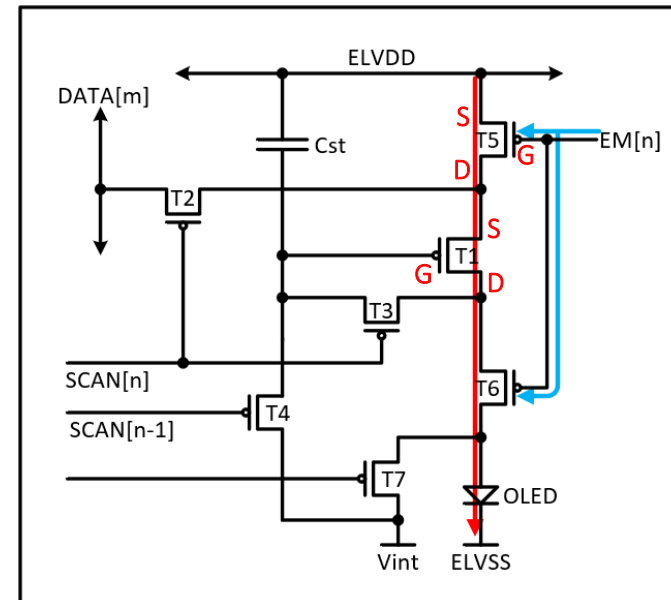
15[d] a fourth transistor including a gate to which a current light-emitting signal is applied, a source to which a power supply voltage is applied, and a drain coupled to the source of the second transistor;

Sourcely Plus Product

The pixel circuit of the Sourcely Plus Product has a fourth transistor including a gate to which a current light-emitting signal is applied, a source to which a power supply voltage is applied, and a drain coupled to the source of the second transistor. As shown in the annotated circuit diagram below, a fourth transistor **T5** has a source coupled to **ELVDD** and a drain coupled to the source of transistor **T1**. In response to an active (low) current light-emitting signal delivered on emission line **EM[n]**, fourth transistor **T5** delivers a power supply voltage from **ELVDD** to second transistor **T1**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



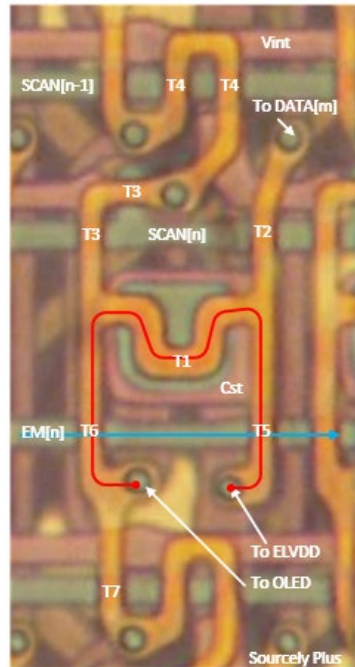
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

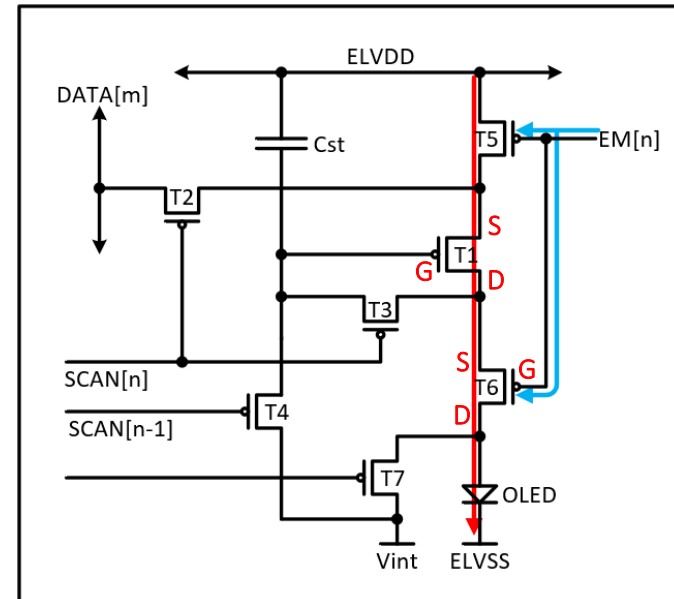
15[e] a fifth transistor including a gate to which the current light-emitting signal is applied, a source coupled to the drain of the second transistor, and a drain coupled to one terminal of an electroluminescent element;

Sourcely Plus Product

The pixel circuit of the Sourcely Plus Product has a fifth transistor including a gate to which the current light-emitting signal is applied, a source coupled to the drain of the second transistor, and a drain coupled to one terminal of an electroluminescent element. In the annotated circuit diagram below, a fifth transistor **T6** has a source coupled to a drain of second transistor **T1**, and a drain coupled to one terminal of an electroluminescent element (**OLED**). As further shown in the annotated circuit diagram, in response to an active (low) current light-emitting signal delivered on emission line **EM[n]**, fifth transistor **T6** turns on and delivers driving current that flows through second transistor **T1** to the **OLED**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown Photos)



Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599	Sourcely Plus Product
<p>15[f] the electroluminescent element having the one terminal coupled to the drain of the fifth transistor and the other terminal grounded; and</p>	<p>The pixel circuit of the Sourcely Plus Product has an electroluminescent element with one terminal coupled to the drain of the fifth transistor and the other terminal grounded.</p> <p>As shown in the annotated circuit diagram below, the pixel circuit of the Sourcely Plus Product has an electroluminescent element (OLED) with a first terminal, the anode, coupled to the drain of the fifth transistor T6. The other terminal of the OLED, the cathode, is grounded to facilitate the flow of current from T6 through the anode of the OLED to the cathode in the light-emission phase.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div data-bbox="711 578 1068 1243" data-label="Image"> <p>A scanning electron micrograph (SEM) of the Sourcely Plus pixel circuit. The image shows a complex layout of transistors and interconnects. Labels include: SCAN[n-1], T4, T4, To DATA[m], Vint, T3, T3, SCAN[n], T2, T1, Cst, EM[n], T6, T5, To ELVDD, To OLED, T7, and Sourcely Plus. Arrows point from the text 'To ELVDD' and 'To OLED' to their respective connections in the micrograph.</p> </div> <div data-bbox="1163 578 1829 1175" data-label="Diagram"> <p>A schematic diagram of the Sourcely Plus Equivalent Circuit. It shows a network of transistors T1 through T7 and a capacitor Cst. The circuit is connected to various signals: DATA[m], SCAN[n], SCAN[n-1], ELVDD, ELVSS, and Vint. Transistor T5 is connected to ELVDD and its drain is connected to EM[n]. Transistor T6 has its source connected to ELVSS (labeled 'D' in red) and its gate connected to SCAN[n] (labeled 'S' in red). The drain of T6 is connected to the anode of an OLED element. The cathode of the OLED is connected to ELVSS. Other transistors (T1, T2, T3, T4, T7) are configured as a network between the data, scan, and power lines.</p> </div> </div> <p style="text-align: center;">Sourcely Plus Equivalent Circuit</p> <p>Annotated Exhibit 2038 at 5 (Sourcely Plus Teardown Photos)</p>

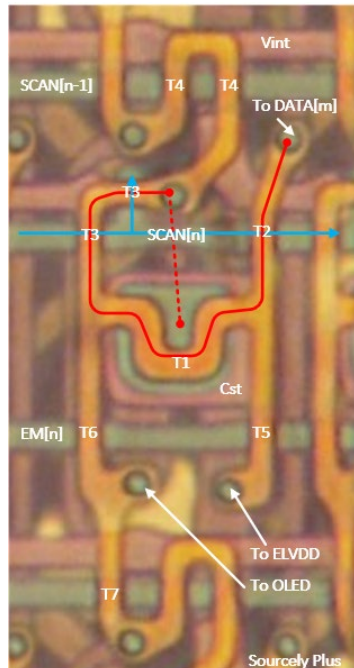
U.S. Pat. No. 7,414,599

15[g] a capacitor in which one terminal of the capacitor is coupled to the gate of the second transistor and a power supply voltage is applied to the other terminal of the capacitor.

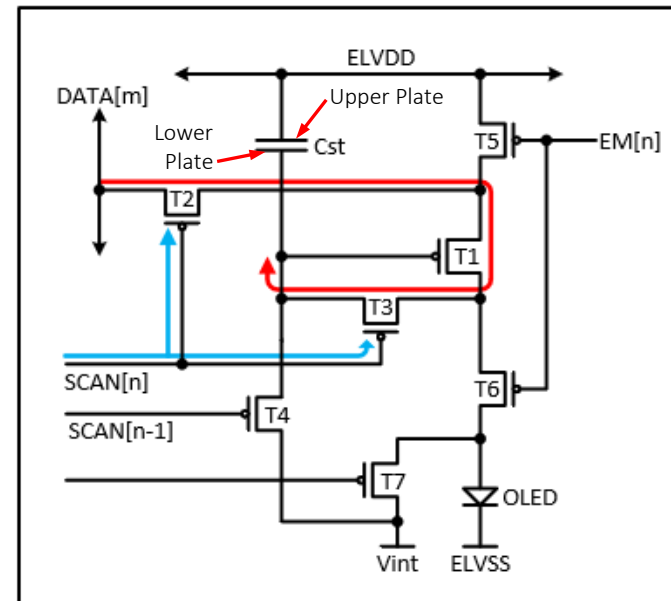
Sourcely Plus Product

The pixel circuit of the Sourcely Plus Product has a capacitor in which one terminal of the capacitor is coupled to the gate of the second transistor and a power supply voltage is applied to the other terminal of the capacitor.

As shown in the annotated circuit diagram below, the lower plate (terminal) of the capacitor **Cst** is coupled to the gate of the second transistor **T1**, while a power supply voltage **ELVDD** is applied to the upper plate (terminal) of **Cst**. In response to an active (low) current scan line signal (blue line) delivered on scan line **GW[N]**, the data signal voltage (red line) on data line **Data** is delivered to the second transistor **T1** and to the capacitor **Cst** (see *a/so* claim element **15[a]**above).



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



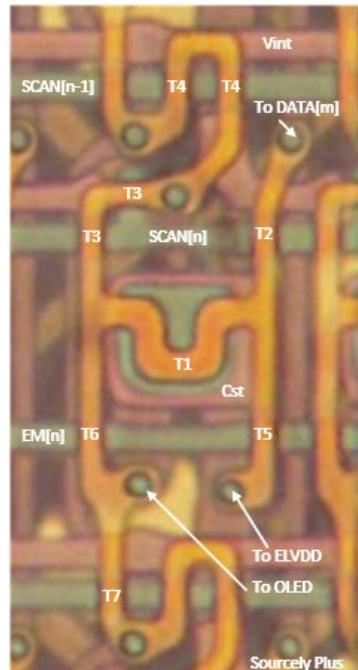
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

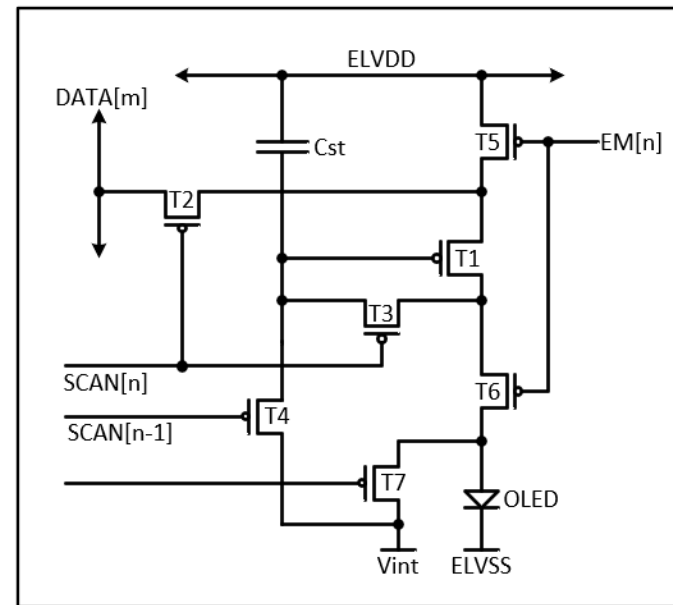
Sourcely Plus Product

17[preamble] A pixel circuit in an organic light emitting device having a plurality of data lines, a plurality of scan lines, a plurality of power lines, and a plurality of pixels each connected to one associated data line, scan line and power line of the plurality of data lines, scan lines and power lines, each pixel comprising:

The Sourcely Plus Product includes a pixel circuit in an organic light-emitting device. For example, the circuit diagram below of the Sourcely Plus 12Pro Soft OLED depicts the transistors **T1–T7**, the capacitor **Cst**, and the **OLED** element.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599	Sourcely Plus Product
<p>17[preamble] A pixel circuit in an organic light emitting device having a plurality of data lines, a plurality of scan lines, a plurality of power lines, and a plurality of pixels each connected to one associated data line, scan line and power line of the plurality of data lines, scan lines and power lines, each pixel comprising: (cont'd)</p>	 <p>Exhibit 2038 Sourcely Plus Teardown Photos) at 1, 4</p>

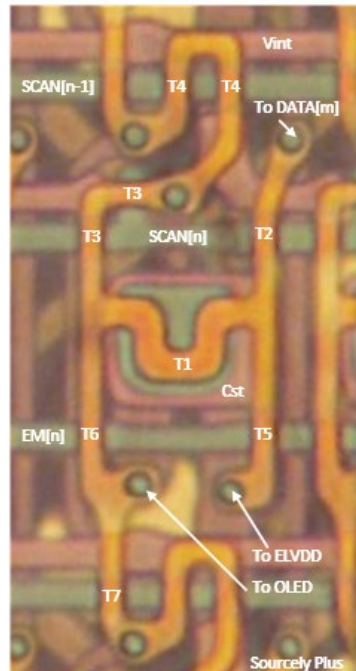
U.S. Pat. No. 7,414,599	Sourcely Plus Product
<p>17[preamble] A pixel circuit in an organic light emitting device having a plurality of data lines, a plurality of scan lines, a plurality of power lines, and a plurality of pixels each connected to one associated data line, scan line and power line of the plurality of data lines, scan lines and power lines, each pixel comprising: (<i>cont'd</i>)</p>	<p>The Sourcely Plus Product includes a plurality of pixel circuits. See <i>generally</i> claims 1–16 above. The plurality of pixel circuits is found in the scan area identified below, wherein each pixel circuit is connected to an associated one of a plurality of data lines, an associated one of a plurality of scan lines, an associated one of a plurality of power lines, and an associated one of a plurality of power lines.</p> <div data-bbox="737 506 1787 1227" data-label="Image"> <p>A color micrograph showing a grid of pixel circuits. The image is annotated with several labels and arrows: <ul style="list-style-type: none"> DATA[m]: An arrow points to a horizontal line in the upper left quadrant. ELVDD: An arrow points to a horizontal line in the middle left quadrant. Pixel Connection: An arrow points to a vertical line in the lower left quadrant. SCAN[n]: An arrow points to a vertical line in the lower right quadrant. The pixel circuits themselves are visible as repeating patterns of green, yellow, and red/purple structures. </p> </div> <p>Annotated Exhibit 2038 at 6 (Sourcely Plus Teardown Photos)</p>

U.S. Pat. No. 7,414,599

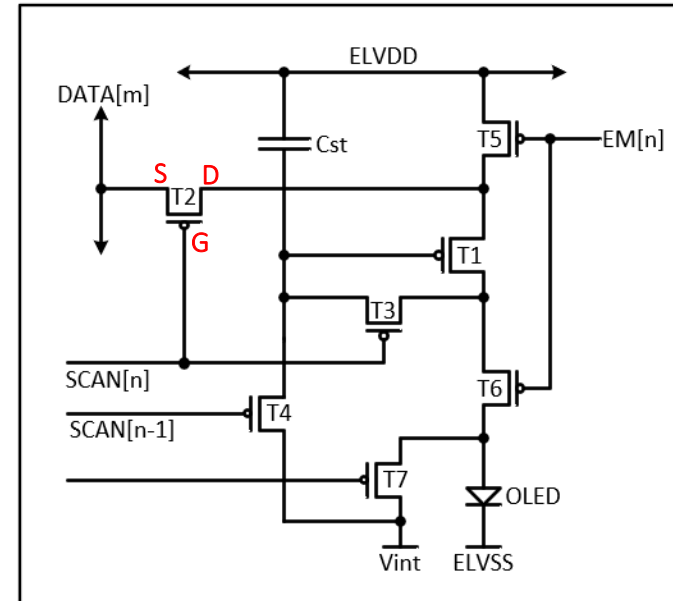
Sourcely Plus Product

17[a] a first transistor including a gate to which a current scan signal to be applied to the associated scan line is applied, and a source to which a data signal voltage from the data line is applied;

The pixel circuit of the Sourcely Plus Product has a first transistor including a gate to which a current scan signal to be applied to the associated scan line is applied, and a source to which a data signal voltage from the data line is applied. As shown in the annotated circuit diagram below, a current scan signal from the scan line **GW[N]** is applied to the gate of the first transistor **T2**, and a data signal voltage from data line **Data** is applied to the source of the first transistor **T2**.



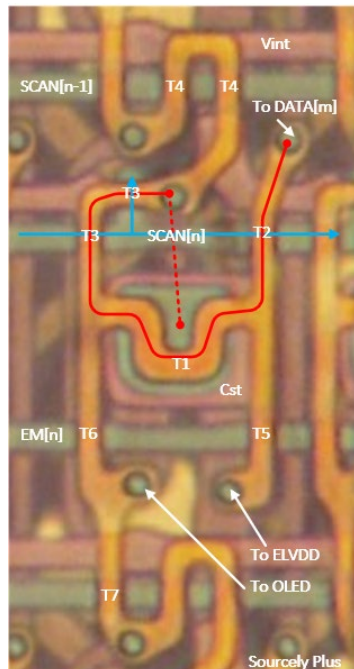
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



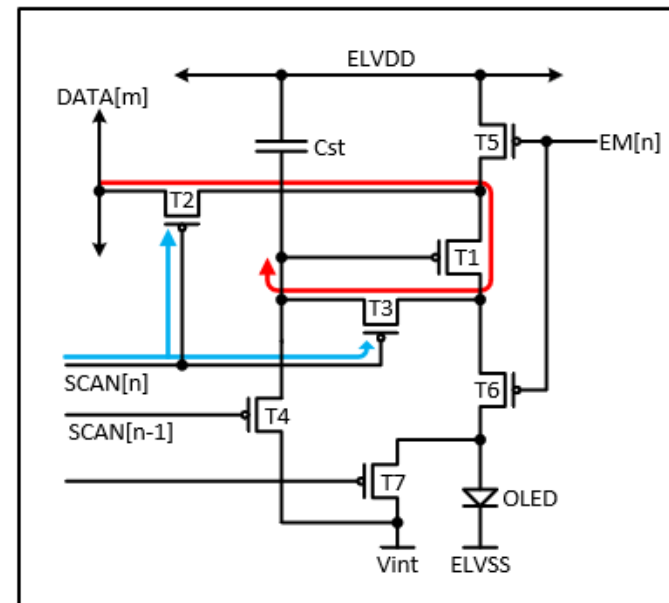
Sourcely Plus Equivalent Circuit

17[a] a first transistor including a gate to which a current scan signal to be applied to the associated scan line is applied, and a source to which a data signal voltage from the data line is applied;
(cont'd)

As reflected in the annotated circuit diagram below, in response to an active (low) current scan line signal (blue line) delivered on scan line **SCAN[n]**, first transistor **T2** delivers the data signal voltage (red line) present on data line **DATA[m]**. The annotated circuit diagram below depicts an exemplary voltage path from data line **DATA[m]** through transistors **T2-T1-T3** to the gate of transistor **T1**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



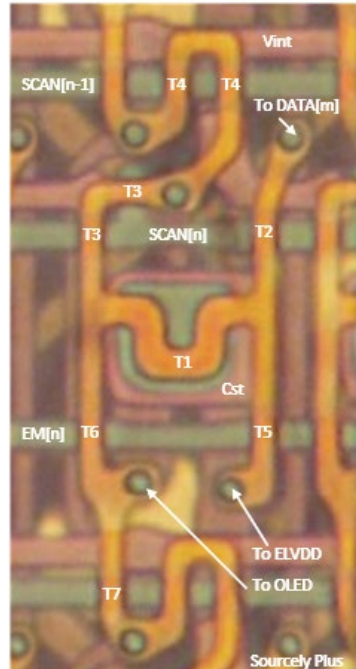
Sourcely Plus Equivalent Circuit

U.S. Pat. No. 7,414,599

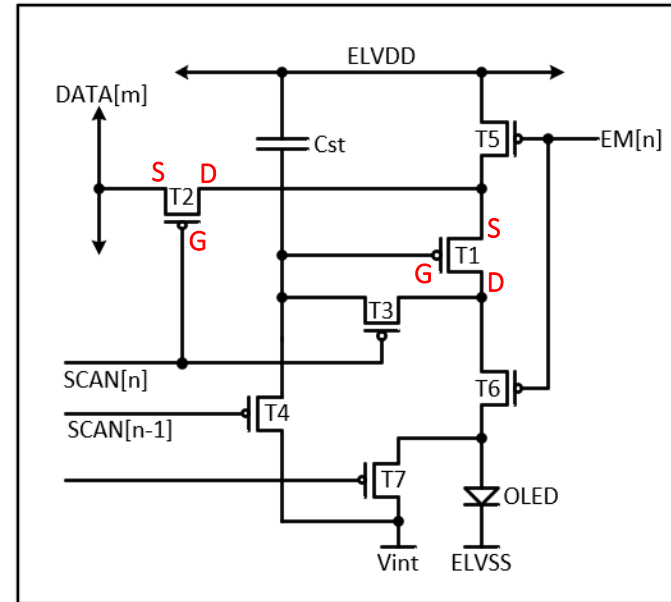
Sourcely Plus Product

17[b] a second transistor whose source is coupled to a drain of the first transistor;

The pixel circuit of the Sourcely Plus Product has a second transistor whose source is coupled to a drain of the first transistor. As shown in the annotated circuit diagram below, the source of the second transistor **T1** is coupled to the drain of the first transistor **T2**.



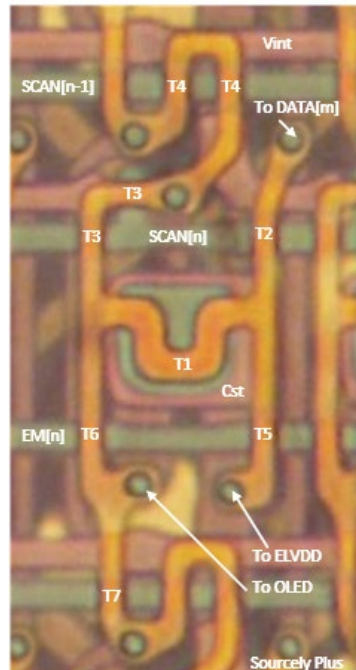
Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



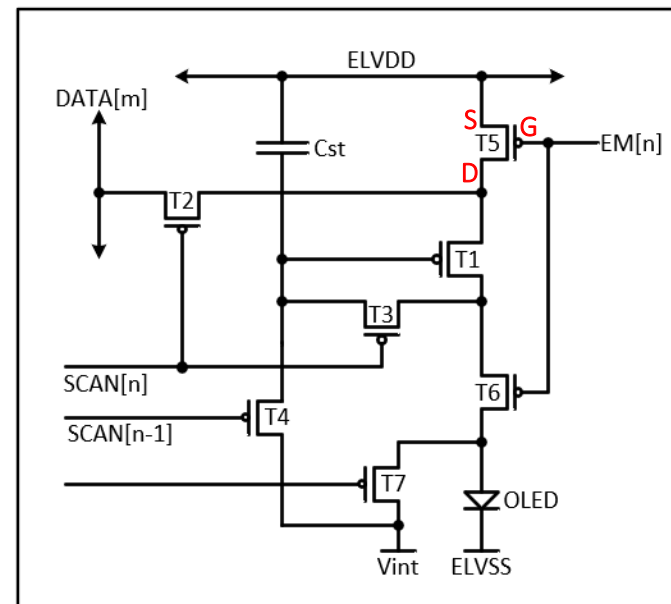
Sourcely Plus Equivalent Circuit

17[d] a fourth emitting transistor including a gate to which a current light-emitting signal is applied, a source to which a power supply voltage is applied, and a drain coupled to the source of the second transistor;

The pixel circuit of the Sourcely Plus Product has a fourth transistor including a gate to which a current light-emitting signal is applied, a source to which a power supply voltage is applied, and a drain coupled to the source of the second transistor. As shown in the annotated circuit diagram below, a current light-emitting signal on emission line **EM[n]** is applied to the gate of fourth transistor **T5**, a power supply voltage from **ELVDD** is applied to the source of fourth transistor **T5**, and the drain of fourth transistor **T5** is coupled to the source of second transistor **T1**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



Sourcely Plus Equivalent Circuit

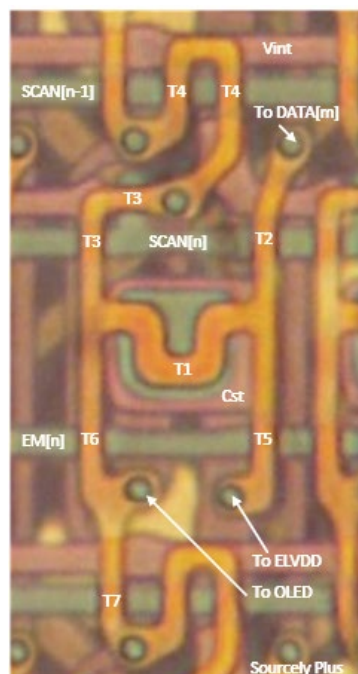
U.S. Pat. No. 7,414,599

17[f] an electroluminescent element including one terminal coupled to the drain of the fifth transistor and the other terminal grounded; and

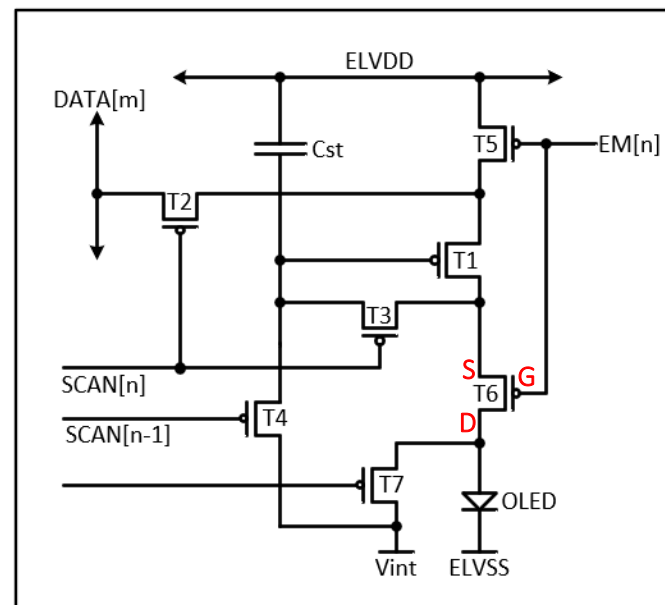
Sourcely Plus Product

The pixel circuit of the Sourcely Plus Product has an electroluminescent element with one terminal coupled to the drain of the fifth transistor and the other terminal grounded.

As shown in the annotated circuit diagram below, the pixel circuit of the XT4 Display has an electroluminescent element (**OLED**) with a first terminal, the anode, coupled to the drain of the fifth transistor **T6**. The other terminal of the **OLED**, the cathode, is grounded to facilitate the flow of current from fifth transistor **T6** through the anode of the **OLED** to the cathode in the light-emission phase.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



Sourcely Plus Equivalent Circuit

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18. The pixel circuit in the organic light emitting device of claim 17, further comprising:

a sixth transistor including a gate to which a scan signal to be applied to a scan line just before the associated scan line is applied,

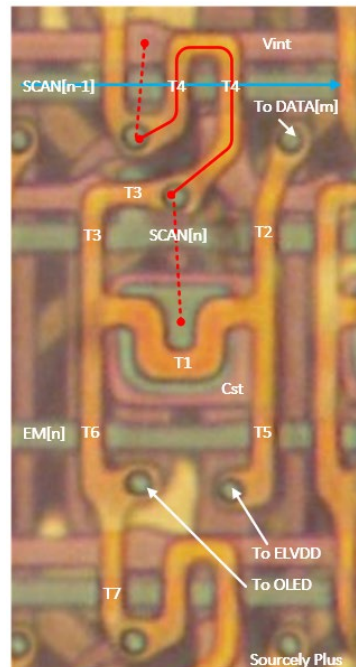
a source coupled to the one terminal of the capacitor, and

a drain to which an initialization voltage is applied.

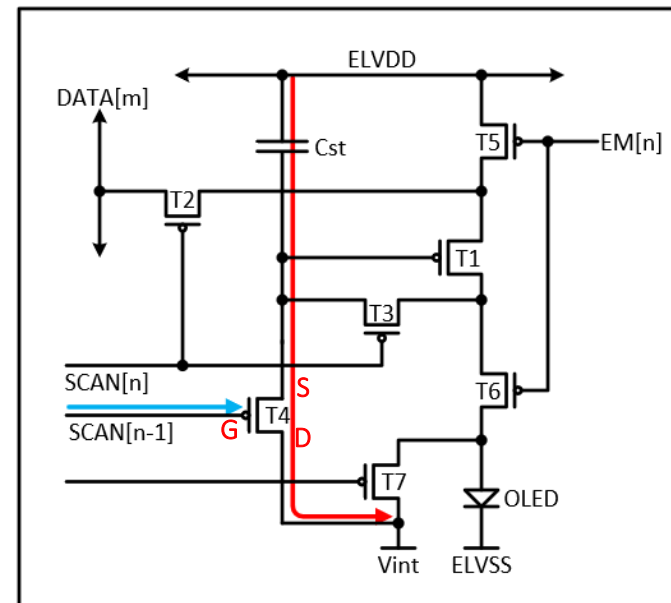
Sourcely Plus Product

The pixel circuit of the Sourcely Plus Product has a sixth transistor, including a gate to which a scan signal to be applied to a scan line just before the associated scan line is applied, a source coupled to the one terminal of the capacitor, and a drain to which an initialization voltage is applied.

As shown in the annotated circuit diagram below, the sixth transistor **T4** is coupled between an initialization voltage line **Vint** and the capacitor **Cst**. A scan signal (blue line) on scan line **GI[N]** that is a scan signal just before the current scan signal on scan line **GW[N]** is applied to the gate of sixth transistor **T4**. The source of sixth transistor **T4** is coupled the one terminal of capacitor **Cst**. An initialization voltage (red line) is applied to the drain of sixth transistor **T4** through the initialization voltage line **Vint**.



Annotated Exhibit 2038 at 5
(Sourcely Plus Teardown
Photos)



Sourcely Plus Equivalent Circuit