Apple Inc. v. Samsung Electronics Co. Ltd. et al

## Exhibit 12

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## EXHIBIT 9 FILED UNDER SEAL

	Page 1
1	UNITED STATES DISTRICT COURT
2	NORTHERN DISTRICT OF CALIFORNIA
3	SAN JOSE DIVISION
4	
5	APPLE INC., a California
	corporation,
6	
	Plaintiff,
7	
0	vs. CASE NO. 11-cv-01846-LHK
8	
2	SAMSUNG ELECTRONICS CO.,
9	LTD., a Korean business
1.0	entity; SAMSUNG ELECTRONICS
10	AMERICA, INC., a New York
1 1	corporation; SAMSUNG
ΤT	TELECOMMUNICATIONS AMERICA,
1.0	LLC, a Delaware limited
12	liability company,
13	Defendants.
1 /	/
15	
16	
17	
18	ATTORNEYS EYES ONLY
10	VIDEORADED DEDOGLETON OF DETAN OF HUDDI
20	VIDEOTAPED DEPOSITION OF BRIAN Q. HUPPI
20	REDWOOD SHORES, CALIFORNIA
22	TUESDAY, OCTOBER 18, 2011
23	DV. ANDDEA M TONACTO HOMADD COD DDD CODD CID
2.4	DI: ANDREA M. IGNACIO NOWARD, CSR, RPR, CCRR, CLR.
25	COR LICENSE INC. 9000
	UUD NU. 420/3

	Page 94		Page 95
1	layers or just one layer?	1	the best possible index matching."
2	MR. BARTLETT: Objection: vague.	2	How were the dummy features in your invention
3	THE WITNESS: I believe we had them on both	3	electrically isolated from the parallel lines?
4	lavers.	4	
5	MR. MACK: Okav.		
6	O And when you look at Figures 11A and 11B. do		
7	vou do vou see the dummy features in those figures?		
8	A Let's see. Where am I?	8	O Okay. Would it be possible to treat the ITO
9	Yes. ves.	9	areas that were to be dummy features to make them more
10	O Okay. And those would be the small	10	resistive than the parallel lines?
11	rectangular boxes between the longer parallel	11	MR. BARTLETT: Objection: it is calls for
12	substantially parallel lines?	12	speculation: and calls for expert testimony.
13	A That's correct.	13	THE WITNESS: I I don't know. I can only
14	O Okay. Could you go to Column 16. Line 20.	14	tell vou how we did it.
15	It explains dummy features a little bit. You see	15	MR. MACK: Okay
16	starting on Line 61 Column 16 says that	16	O But you physically etched away ITO between
17	"The dummy features 204 are electrically	17	the parallel lines and the dummy features: is that
18	isolated and positioned in the gaps between each of	18	right?
19	the lines 206 and 208 Although they may be patterned	19	A That's how
20	senarately the dummy features 204 are typically	20	MR BARTLETT: Objection: vague: lacks
21	natterned along with the lines 206 and 208	21	foundation
22	Furthermore, although they may be formed from	2.2	THE WITNESS: That's how I recall that we did
23	different materials the dummy features 204 are	2.3	it ves
24	typically formed with the same transparent conductive	2.4	MR. MACK: Okay
25	material as the lines as, for example, ITO to provide	25	O And typically it says that the dummy features
	Page 96		Page 97
			ruge 57
	are made from the same material as the conductive		
2	lines; correct?		
3	A Correct.		
4	Q So if you were using 110 for the conductive		
D C	lines, you would also use the same 110 for the dummy		
07	A Thethe horses did it is supported and a set		
0	A That's now we did it in our prototypes, yes.		
0	Q And by using the same material, that provided		
10	the conductive lines: correct?	1	MB MACK: O What han a fit if any would
11	A That's correct	1 1	the use of a virtual ground charge amplifier add to
$12^{11}$	A That's contect. O Okay Were you familiar with any other touch	12	the touch papel
13	screen products that used similar dummy features?	13	MR BARTI FTT: Objection: calls for
14	MR BARTLETT: Objection: vague	1 4	speculation: incomplete hypothetical: calls for expert
15	THE WITNESS: Not that I recall no	15	testimony
16	THE WITNESS. Not that i recail, no.	16	costiniony.
23	MR. BARTLETT: Objection: calls for a legal		
24	conclusion.		
25		25	

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	Page 98		Page 99
1	MR. MACK: Okay.	1	of Apple.
2	Q And is the is the phrase "a virtual ground	2	I I was not at Apple when Apple finally
3	charge amplifier," is that something that you've heard	3	shipped the final product, so I I can't tell you
4	of outside of Apple?	4	what technique they're using on the final product.
5	A I can't say I have, no.	5	Q Okay. But is it your understanding that it's
6	Q Okay. So as far as your your best	6	the the iPhone that's shipping today uses the
7	understanding is, there's no that's not a term of	7	invention described in this patent?
8	art; correct?	8	A You know, I can't be sure. I've never torn
9	MR. BARTLETT: Objection; calls for a legal	9	one apart to see how it works, so
10	conclusion.	10	Q Okay.
11	THE WITNESS: Yeah, I'm not aware of	11	A I can't speculate.
12	necessarily all the different terms that could be	12	Q And you mentioned you're not aware of any
13	used. I know the term "virtual ground" I'm I'm	13	third parties that are practicing the invention
14	aware of being used, "charge amplifier." The whole	14	described in this patent; right?
15	combination, I can't say I know for sure.	15	A Not that I'm aware of.
16	MR. MACK: Q. Are you aware of any products	16	O All right. So you you were obviously
17	on today's market that may embody the invention	17	aware of touch screen displays prior to May of 2004;
18	described in this patent?	18	correct?
19	MR. BARTLETT: Objection; lacks foundation;	19	A Correct.
20	calls for a legal conclusion.	20	Q So you didn't invent capacitive touch screen
21	THE WITNESS: I don't know of any	21	displays; right?
22	specifically, no.	22	MR. BARTLETT: Objection; vague.
23	MR. MACK: Q. Well, the Apple products would	23	THE WITNESS: It depends on what type you
24	embody this invention; correct.	24	mean what type of capacitive touch screens you
25	A Oh, oh, sorry. I thought you meant outside	25	mean.
	Page 100		Page 101
1	MR. MACK: Okay.	1	copper two layers of copper electrodes separated by
2	O You didn't invite you didn't invent the	2	a dielectric. That was very, very common in things
3	self-capacitive type of	3	like the Synaptics trackpads.
4	A No.	4	MR. MACK: Okay.
5	Q touch displays; right?	5	Q Were you aware of any transparent Synaptics
6	A No.	6	products?
7	Q Do you believe that you invented the	7	A I believe they did give us a demo once
8	mutual-capacitive type of touch displays?	8	showing a transparent self-capacitive type touch
9	MR. BARTLETT: Objection; vague; calls for a	9	panel.
10	legal conclusion; calls for expert testimony.	10	Q Okay. And did that transparent
11	THE WITNESS: Well, I can tell you that	11	self-capacitive type touch panel include two layers of
12	the the you know, the prototypes that we	12	electrodes?
13	implemented used mutual capacitance.	13	A I don't know. I didn't take it apart.
14	MR. MACK: Q. And you weren't aware of any	14	Q Okay. And you also didn't invent multi-touch
15	other touch displays that used mutual capacitance	15	recognition on a touch display; correct?
16	before May of 2004; correct.	16	MR. BARTLETT: Objection; vague; calls for a
ц. <sup>-</sup> 7	A No.	17	legal conclusion; calls for expert testimony.
18	Q Okay. What about the two layers of	18	THE WITNESS: Can you repeat that question
19	electrodes that were spatially separated from one	<u>ца</u>	one more time, please.
20	another? Were you aware of any other products prior	20	MR. MACK: Sure.
	to May of 2004 that exhibited that feature?	KT KT	Q You also didn't invent multi-touch
22	MR. BARILEII: Objection; vague; calls for a	22	recognition on a touch display; correct?
23 07	regai conclusion; calls for expert testimony.	23 01	IVIK. DAKILEII: Same objections.
24 05	self-capacitive opaque touch devices that used	24	done had been able to implement multiple touch
Z	sen-capacitive opaque touch devices that used	кJ	uone nau been able to implement multiple-touch

1       left-hand column, SmartSkin sensor architecture. It       2         2       says that:       2         3       "Figure 2 shows the principal of operation of       3         4       the SmartSkin sensor. The sensor consists of a       5         5       grid-shaped transmitter and receiver clectrodes.       4         6       clectrodes, and the horizontal wires are transmitter       6         7       clectrodes, and the horizontal wires are transmitter       6         8       by a wave signal, the receiver receiver this wave       6         9       signal because each crossing point       10         11       transmitter/receiver pairs acts as a very weak       11         12       transmitter/receiver pairs acts as a very weak       11         13       Correct?       13         14       A Yes.       14       A Yes.         9       And looking at that description above with       16       Q So there must be there must be some space         17       that there are two layers of copper wires?       17       them, and transmitter electrodes; right.       18         18       MR. BARTLETT: Same objections.       18       Wires; correct?       17         19       THE WITNESS: Well, it looks like there       19
2       says that:       2       Q And all the vertical wires are transmitter         3       "Figure 2 shows the principal of operation of the SmarSkin sensor. The sensor consists of a grid-shaped transmitter and receiver electrodes       3         4       Remarks and the horizontal wires are transmitter       6         6       (copper wires). The vertical wires are transmitter       6         7       electrodes, and the horizontal wires are transmitter       6         9       by a wave signal, the receiver receiver sectives       6         9       signal because each crossing point       10         11       transmitter/receiver pairs acts as a very weak       11         12       capacitor."       10         13       Correct?       13         14       A Yes.       14         15       Q And looking at that description above with       15         16       in context with Figure 2, would that indicate to you       16         16       in context with Figure 2, would that indicate to you       17         17       THE WITNESS: Well, it looks like there       19         18       MR. BARTLETT: Same objections.       18         19       THE WITNESS: Well, it looks like there       19         21       call them, and transmitter electro
3       "Figure 2 shows the principal of operation of 4 the SmartSkin sensor. The sensor consists of a 5 grid-shaped transmitter and receiver electrodes 6 (copper wires). The vertical wires are transmitter 7 electrodes, and the horizontal wires are receiver 8 electrodes. When one of the transmitters is excited 9 by a wave signal, the receiver receives this wave 9 signal because each crossing point 11 transmitter/receiver pairs acts as a very weak 12 capacitor."       MR. MACK: Q. And in order for the 13 transmitter/receiver pairs acts as a very weak 14 capacitor."       MR. MACK: Q. And in order for the 14 transmitter/receiver pairs acts as a very weak 15 capacitor."         10       MR. BARTLETT: Same objections. 16 in context with Figure 2, would that indicate to you 17 that there are two layers of copper wires? 19 THE WITNESS: Well, it looks like there 20 are - there are two - there are receiver, as they 21 call them, and transmitter electrodes; right.       MR. MACK: Naght. 23 horizontal wires are receiver as they 24 mot be on the same layer. I don't - or on separate 25 horizontal wires are receiver electrodes; right.       MR. MACK: Okay, 23 are serve electrodes; right.       MR. MACK: Okay, 24 mot be a conductive and grounded object 24 approaches a crossing point, it capacitively couples 34 to the electrodes and drains the wave signal. As a 44 result, the received signal amplitude becomes weak. 35 mutual-capacitive sensing arrangement?       35 measuring this effect, it is possible to detect the 39 mutual-capacitive sensing arrangement?       36 mutual-capacitive sensing arrangement?       37 metuell-chand side: 30 mutual-capacitive sensing arrangement?         36 mutual-capacitive sensing arrangement?       MR. BARTLETT: Same objections. 30 to the electrodes and drains the wave signal. As a 31 result, the received signal ampl
4       the SmartSkin sensor. The sensor consists of a       4         5       grid-shaped transmitter and receiver electrodes.       5         6       (copper wires). The vertical wires are transmitter       6         7       electrodes, and the horizontal wires are receiver       6         8       electrodes, when one of the transmitter's is excited       9         9       ya wave signal, the receiver receives this wave       9         11       transmitter/receiver pairs acts as a very weak       11         12       capacitor."       0         13       Correct?       12         14       A Yes.       14         15       0       And looking at that description above with         16       in context with Figure 2, would that indicate to you       16         17       that there are two - there are receiver, as they       17         18       Wires; correct?       18         19       THE WITNESS: Well, it looks like there       19         19       THE WITNESS: Well, it looks like there       19         19       THE WITNESS: Well, it looks like there       19         20       are - there are two - there are receiver, as they       20         21       call them, and transmitter electrodes; right. </td
5       grid-shaped transmitter and receiver electrodes       5       THE WITNESS: It appears that way.         6       (copper wires). The vertical wires are transmitter       6       MR. MACK: Q. And in order for the         7       electrodes, and the horizontal wires are receiver       7       intersection, as it describes, to act as a very weak         8       electrodes. When one of the transmitters is excited       9       wave signal, the receiver receives this wave         9       signal because each crossing point       10       MR. BARTLETT: Same objections.         11       transmitter/receiver pairs acts as a very weak       11       THE WITNESS: Yeah, without seeing exactly         12       capacitor."       12       the physical orientation, it would be hard to say.         13       Correct?       13       They for something to be a capacitor, they can't be         14       A Yes.       14       OS to there must be there must be some space in between the horizontal wires and the vertical         14       m context with Figure 2, would that indicate to you       16       Q So there must be there must be some space in between the horizontal wires and the vertical         15       MR. BARTLETT: Same objections.       18       Wires; correct?         16       apers. If shard to say.       17       in between the horizontal wires and the vertical
1111(copper wires). The vertical wires are transmitter1electrodes, when one of the transmitters is excited2by a wave signal, the receiver receives this wave3by a wave signal, the receiver receives this wave1transmitter/receiver pairs acts as a very weak1transmitter/receiver pairs acts as a very weak2capacitor."1transmitter/receiver pairs acts as a very weak2capacitor."2Correct?1Theyf or something to be a capacitor, they can't be2context with Figure 2, would that indicate to you1there are two layers of copper wires?1MR. BARTLETT: Same objections.1THE WITNESS: Well, it looks like there2are there are treceiver, as they2call them, and transmitter electrodes which may or may2not be on the same layer. I don't or on separate3the receiver electrodes; right.2Page 1561"When a conductive and grounded object2approaches a crossing point, it capacitively couples3to the electrodes and drains the wave signal. As a4metual-capacitive sensing4mutual-capacitive sensing arrangement?1"When a conductive object, such as a human4mutual-capacitive sensing arrangement?5by measuring this effect, it is possible to detect the6mutual-capacitive sensing arrangement?1MR. BARTLETT: Same objections.
is compared with the formation with the formation of the for
electrodies. When one of the transmitters is excited       intersection, is a to discribes, to dive as a very weak         9 by a wave signal, the receiver receives this wave       intersection, is an ideactron, it is an ideactron, is an ideactron, it i
by away sering his the receiver receives this wave       in our conductive of the transmitter's section of the section of the transmitter's seand the sectend of the transmitter's section of the transmitter's
by a wave signal, the receiver intervents in wave       p         correct:       MR. BARTLETT: Same objections.         The WITNESS: Yeah, without seeing exactly         transmitter/receiver pairs acts as a very weak       11         Correct?       12         A Yes.       13         Correct?       14         A Yes.       14         15       Q And looking at that description above with       15         16       in context with Figure 2, would that indicate to you       16         17       that there are two layers of copper wires?       17         18       MR. BARTLETT: Same objections.       18         19       THE WITNESS: Well, it looks like there       19         20       are there are two there are receiver, as they       20         21       call them, and transmitter electrodes which may or may       21         22       not be on the same layer. I don't or on separate       22         23       MR. MACK: Q. From the text, all the       24         24       MR. MACK: Q. From the text, all the       24         25       result, the received signal amplitude becomes weak.       33       34         26       result, the received signal amplitude becomes weak.       34       34
10       signal because each crossing point       10       MRE BARTLETT: Same objections.         11       transmitter/receiver pairs acts as a very weak       11       THE WITNESS: Yeah, without seeing exactly         12       capacitor."       12       THE WITNESS: Yeah, without seeing exactly         12       correct?       13       They for something to be a capacitor, they can't be         14       A Yes.       14       they scalar orientation, it would be hard to say.         15       Q And looking at that description above with       16       OS othere must be there must be some space         16       in context with Figure 2, would that indicate to you       16       Q So there must be there must be some space         17       that there are two layers of copper wires?       17       in between the horizontal wires and the vertical         18       MR. BARTLETT: Same objections.       18       wires; correct?         19       THE WITNESS: Well, it looks like there       19       MR. BARTLETT: Same objections.         21       atr e- there are two there are receiver, as they       20         22       not be on the same layer. I don't or on separate       21       MR. MACK: Okay.         23       layers. If's hard to say.       23       arangement, where it says:         24
11       THRE WITNESS: Year, without seeing exactly         12       capacitor."       12         13       Correct?       13         14       A Yes.       14         15       Q And looking at that description above with       15         16       in context with Figure 2, would that indicate to you       16         16       in context with Figure 2, would that indicate to you       16         17       that there are two layers of copper wires?       17         18       MR. BARTLETT: Same objections.       18         19       THE WITNESS: Well, it looks like there       19         20       are there are two there are receiver, as they       20         21       not be on the same layer. I don't or on separate       21         23       horizontal wires are receiver electrodes; right.       23         24       MR. MACK: Q. From the text, all the       24         25       horizontal wires are receiver electrodes; right.       25         26       result, the received signal amplitude becomes weak.       3         3       to the electrodes and drains the wave signal. As a       3       3         4       result, the received signal amplitude becomes weak.       5       MR. MACK: Q. Do you see the next in the next c
12       capacitor.       12       the physical orientation, it would be hard to say.         13       Correct?       13       They for something to be a capacitor, they can't be conductively connected to each other.         14       A Yes.       14       the physical orientation, it would be hard to say.         15       Q And looking at that description above with       15       They for something to be a capacitor, they can't be conductively connected to each other.         16       in context with Figure 2, would that indicate to you       16       Q So there must be there must be some space in between the horizontal wires and the vertical         17       that there are two layers of copper wires?       17       MR. MACK: Right.       Q So there must be there must be some space in between the horizontal wires and the vertical         18       MR. BARTLETT: Same objections.       18       wires; correct?         19       THE WITNESS: Well, it looks like there       19         20       are there are two there are receiver, as they       20         21       call them, and transmitter electrodes which may or may       21         22       not be on the same layer. I don't or on separate       22         23       layers. It's hard to say.       23         24       MR. MACK: Q. From the text, all the       24         25
13       Correct?       13       They -r for something to be a capacitor, they can tribe conductively connected to each other.         14       A Yes.       14       conductively connected to each other.         15       Q And looking at that description above with       15       MR. MACK: Right.         16       in context with Figure 2, would that indicate to you       16       Q So there must be there must be some space         17       that there are two layers of copper wires?       17       in between the horizontal wires and the vertical         18       MR. BARTLETT: Same objections.       18       wires; correct?         19       THE WITNESS: Well, it looks like there       19       MR. BARTLETT: Same objections.         20       are there are two there are receiver, as they       20         21       call them, and transmitter electrodes which may or may       21         22       not be on the same layer. I don't or on separate       22         23       layers. It's hard to say.       23         24       MR. MACK: Q. From the text, all the       24         25       horizontal wires are receiver electrodes; right.       25         26       approaches a crossing point, it capacitively couples       3         3       to the electrodes and drains the wave signal. As a       3 </td
14       A Yes.       14       conductively connected to each other.         15       Q And looking at that description above with       15       MR. MACK: Right.         16       in context with Figure 2, would that indicate to you       16       Q So there must be there must be some space         17       that there are two layers of copper wires?       17       in between the horizontal wires and the vertical         18       MR. BARTLETT: Same objections.       18       wires; correct?         19       THE WITNESS: Well, it looks like there       19       MR. BARTLETT: Same objections.         20       are there are two there are receiver, as they       20       THE WITNESS: I would say that would have to         21       call them, and transmitter electrodes which may or may       21       be true, yes.       MR. MACK: Okay.         23       layers. It's hard to say.       23       Q And then the next sentence doesn't this       next sentence describe a mutual-capacitive sensing         25       horizontal wires are receiver electrodes; right.       24       Page 156       Page 157         1       "When a conductive and grounded object       1       Apple in the multi-touch panel as receiver calling       the receiver electrodes, no.         3       to the electrodes and drains the wave signal. As a       3       THE WITNESS: I
15       Q And looking at that description above with       15       MR. MACK: Right.         16       in context with Figure 2, would that indicate to you       16       Q So there must be there must be some space         17       that there are two layers of copper wires?       17       in between the horizontal wires and the vertical         18       MR. BARTLETT: Same objections.       18       wires; correct?         19       THE WITNESS: Well, it looks like there       19       MR. BARTLETT: Same objections.         20       are there are two there are receiver, as they       20       THE WITNESS: I would say that would have to         21       call them, and transmitter electrodes which may or may       21       be true, yes.       MR. MACK: Okay.         22       layers. It's hard to say.       23       Q And then the next sentence doesn't this       next sentence describe a mutual-capacitive sensing         25       horizontal wires are receiver electrodes; right.       25       maxt sentence describe a mutual-capacitive sensing         2       approaches a crossing point, it capacitively couples       1       Apple in the multi-touch panel as receiver electrodes?         3       to the electrodes and drains the wave signal. As a       3       THE WITNESS: I don't remember ever calling         4       result, the received signal amplitude becomes weak.
16       in context with Figure 2, would that indicate to you       16       Q       So there must be there must be some space         17       that there are two layers of copper wires?       17       in between the horizontal wires and the vertical         18       MR. BARTLETT: Same objections.       18       wires; correct?         19       THE WITNESS: Well, it looks like there       19       MR. BARTLETT: Same objections.         20       are there are two there are receiver, as they       20       THE WITNESS: I would say that would have to         21       call them, and transmitter electrodes which may or may       21       be true, yes.         22       not be on the same layer. I don't or on separate       22       MR. MACK: Q. From the text, all the       24         24       MR. MACK: Q. From the text, all the       24       next sentence describe a mutual-capacitive sensing         25       horizontal wires are receiver electrodes; right.       25       MR. BARTLETT: Same objections.         24       When a conductive and grounded object       1       Apple in the multi-touch panel as receiver electrodes?         2       approaches a crossing point, it capacitively couples       3       THE WITNESS: I don't remember ever calling         3       to the electrodes and drains the wave signal. As a       3       THE WITNESS: I don't remember ev
17       that there are two layers of copper wires?       17       in between the horizontal wires and the vertical wires?         18       MR. BARTLETT: Same objections.       18       wires; correct?         19       THE WITNESS: Well, it looks like there       19       MR. BARTLETT: Same objections.       18         20       are there are two there are receiver, as they       20       THE WITNESS: I would say that would have to         21       call them, and transmitter electrodes which may or may       21       be true, yes.         22       not be on the same layer. I don't or on separate       22       MR. MACK: Okay.         23       layers. It's hard to say.       23       Q And then the next sentence doesn't this         24       MR. MACK: Q. From the text, all the       24       mext sentence describe a mutual-capacitive sensing         25       horizontal wires are receiver electrodes; right.       25       Page 156         1       "When a conductive and grounded object       1       Apple in the multi-touch panel as receiver electrodes?         2       approaches a crossing point, it capacitively couples       3       THE WITNESS: I don't remember ever calling         3       to the electrodes and drains the wave signal. As a       3       THE WITNESS: I don't remember ever calling         4       result, the recei
18       MR. BARTLETT: Same objections.       18       wires; correct?         19       THE WITNESS: Well, it looks like there       19       MR. BARTLETT: Same objections.         20       are there are two there are receiver, as they       20       THE WITNESS: I would say that would have to         21       call them, and transmitter electrodes which may or may       21       be true, yes.         22       not be on the same layer. I don't or on separate       22       MR. MACK: Okay.         23       layers. It's hard to say.       23       Q And then the next sentence doesn't this         24       MR. MACK: Q. From the text, all the       24       next sentence describe a mutual-capacitive sensing         25       horizontal wires are receiver electrodes; right.       25       arrangement, where it says:         Page 156         1       "When a conductive and grounded object       1       Apple in the multi-touch panel as receiver electrodes?         2       approaches a crossing point, it capacitively couples       3       THE WITNESS: I don't remember ever calling         3       to the electrodes and drains the wave signal. As a       3       THE WITNESS: I don't remember ever calling         4       result, the received signal amplitude becomes weak.       5       MR. MACK: Q. Do you see the next in the
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20       are there are two there are receiver, as they       20       THE WITNESS: I would say that would have to         21       call them, and transmitter electrodes which may or may       21         22       not be on the same layer. I don't or on separate       22         23       layers. It's hard to say.       23         24       MR. MACK: Q. From the text, all the       24         25       horizontal wires are receiver electrodes; right.       25         Page 156         1       "When a conductive and grounded object       1         2       approaches a crossing point, it capacitively couples       3         3       to the electrodes and drains the wave signal. As a       3         4       result, the received signal amplitude becomes weak.       5         5       By measuring this effect, it is possible to detect the       5         6       proximity of a conductive object, such as a human       6         7       hand."       7         8       Does this paragraph to you describe a       8         9       mutual-capacitive sensing arrangement?       9         10       MR. BARTLETT: Same objections.       10         11       THE WITNESS: Again, without, you know, fully       11
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11 THE WITNESS: Again, without, you know, fully 11 independently measures values for each of the receiver
12 understanding exactly what they're doing, it would be 12 electrodes. These values are integrated to form
13 hard to say. It's it sounds like a 13 two-dimensional sensor values which we call proximity
14 mutual-capacitive system to me. 14 pixels. Once these values are obtained, algorithms
MR. MACK: O. Has anyone inside of Apple. 15 similar to those used in image processing, such as
16 when you were developing your multi-touch prototype. 16 peak detection, connected region analysis, and
17 referred to the drive lines as transmitter lines or 17 template matching, can be applied to recognized
18 transmitter electrodes. 18 gestures. As a result, the system can recognize
19 MR. BARTLETT: Objection: vague: overbroad: 19 multiple objects: for example, hands."
20 and calls for speculation. 20 Do vou see that?
THE WITNESS: I don't remember them ever 21 A Yes.
22 being called transmitter electrodes, no. 22 O So does this appear does this appear to
23 MR. MACK: Okay. 23 show a mutual-capacitive-based sensing arrangement
24 O What about the sense lines? Did have you 24 that would recognize multiple touches?
$\mathbb{P}^{\perp}$ $\nabla$ man about the sense mass, $\mathbb{D}[u]^{\perp}$ have you $\mathbb{P}^{\perp}$ that would recognize multiple touches?

	Page 166		Page 167
1	record.	1	say, you know, independent of any meeting with
2	(Recess taken.)	2	counsel, have you seen this before and when, you can
3	THE VIDEOGRAPHER: This marks the beginning	3	go ahead and do that.
4	of Volume I. Disc 3. in the deposition of Brian Huppi.	4	MR. MACK: Okay.
5	The time is 2:33 n m and we are on the record	5	O Independent independent from any meetings
6	MR MACK: O Mr Hunni you have in front	6	you had with counsel do you recall ever seeing this
7	of you Exhibit 712 and 713: correct		natent?
8	A Vec	8	A No I do not
9	$\Omega$ And Exhibit 712 is the face of that	G	O Could you look at Figure 2 of this patent
10	exhibit is U.S. Patent 7 372 455: correct?	10	and the corresponding text starting in Column 13
11	$\Delta$ Vec	11	13 Line 30 starts with making reference to Figure 2
12	0 Do you recall seeing this patent before?	12	A Okay
13	MR BARTI FTT: The question as phrased can	13	A Okay. And Column 13 says "Reference is now made to
14	notentially call for attorney client privileged	1 1	Figure 2 which is a general description of the second
15	communication and therefore instruct the witness not	15	finger detection embediment of the present invention "
16	to answer	16	and then it talks about a two dimensional sensor
17	THE WITNESS. I won't an awar	17	and then it tarks about a two-dimensional sensor
10	MP MACK: Q De you know the date that you	1 0	matrix 20; do you see that?
10	MR. MACK: Q. Do you know the date that you	10	A Yes.
20	MD DADTLETT. Some instruction	L 9	Q And it mentions that at each junction between
20 01	MR. BARILEII: Same instruction.	20	the two conductors a certain minimal amount of
21 22	MD MACK. He contrains the date that he	21	capacitance exists. A finger 20 touches the sensor 20
22 23	MR. MACK. The call t tell life the date that he	22	at a certain position and increases the capacitance
23	MP BARTIETT: No. If you want to phrase	23	conductor line 28: correct?
2 I 2 5	your questions as you as you have in the past and	25	A That's what it says was
20	your questions as you as you have in the past and	2.5	A That's what it says, yes.
	Page 168		Page 169
1	Page 168 Q So the two-dimensional sensor matrix shown in	1	Page 169 Q And orthogonal to you would be another term
1 2	Page 168 Q So the two-dimensional sensor matrix shown in Figure 2, that would appear to be, again, similar to	1 2	Page 169 Q And orthogonal to you would be another term for perpendicular; correct?
1 2 3	Page 168 Q So the two-dimensional sensor matrix shown in Figure 2, that would appear to be, again, similar to the SmartSkin matrix that we looked at earlier;	1 2 3	Page 169 Q And orthogonal to you would be another term for perpendicular; correct? A Yes, I think so.
1 2 3 4	Page 168 Q So the two-dimensional sensor matrix shown in Figure 2, that would appear to be, again, similar to the SmartSkin matrix that we looked at earlier; correct?	1 2 3 4	Page 169 Q And orthogonal to you would be another term for perpendicular; correct? A Yes, I think so. Q Okay. Then if you look at Exhibit 713, which
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1 Q It says that "In a preferred embodiment, the 2 sensor is a grid of conductive lines made of 2 layers of parallel conductive layers	Page 171
2 sensor is a grid of conductive lines made of 2 layers of parallel conductive layers	vo different
	are orthogonal to
3 conductive polymers patterned on a PT foil The grid 3 each other: correct?	are orthogonar to
4 is made of two layers which are electrically separated 4 A That's what it says yes	
= is made of two fayers which are electrically separated $=$ A flat's what it says, yes. 5 from each other. One of the lowers contains a set of 5 O And again orthogonal is shot	har another
5 noni each other. One of the layer contains a set of 5 Q And again of hogonal is about	mondioular
o paramet conductors. The other layer contains a set o word another term that means per	pendicular,
Or paramet conductors orthogonal to the first set of     Contect?	
$\circ$ the set of the first layer; correct? $\circ$ A Yes.	C
9 A Correct. 9 Q And then do you see at the to	p of page five,
10 Q is that what it says? $10$ it says in a preferred embodiment,	very first
11 Sorry.	o organic
12 A That's what it says, yep. 12 conductive material on a PT foil. U	rganic conductive
13 Q Sorry. 13 materials are basically more flexible	e and easier to
14 So that would indicate to you the presumption $14$ handle and may be able to lower vis	sual difference
15 of Figure 3, if there's two layers of conductive [15] between conductive to nonconductive	ve area.
16 lines; correct? 16 "However, in different embodi	ments the
17 MR. BARTLETT: Same objections. $17$ present invention sensor can implement	nent another
THE WITNESS: Well, it says the grid is made $18$ transparent conductive materials such that the same transparent conducti	ch as ITO"; do you
19of two layers, so19see that?	
20 MR. MACK: Okay. 20 A Yes.	
THE WITNESS: that's what it says, yep. 21 Q And the ITO, that would refer	r to
MR. MACK: Q. And it says that the layers 22 indium-tin-oxide; correct?	
are made up of parallel lines, correct, or parallel 23 A I believe so, yes.	
24 conductors. 24 Q Okay. And then if you go do	wn to the fifth
A Yes, it does say that. 25 paragraph, in a preferred embodime	ent, the conductors
Page 172	Page 173
1 are straight lines having one millimeter width equally 1 THE WITNESS: Well, it's a b	it hard to say.
2 spaced in a 4 millimeter interval: do you see that? 2 since I don't actually refer to the fig	ure It sounds
3  A Ves 3 like it	ure. It sounds
4 O That would indicate to you that the lines 4 MR MACK: Okay	
5 have an equal nitch? 5 $0$ And then the the next on	page six of
6 A Ves 6 the Exhibit 713 it does go into more	e detail of
7 O And an equal thickness as well or width? 7 Figure 3	
8 A It sounds like it ves	iect of the
9 O Okay And at the bottom of name five in one 9 present invention is to enable as high	her transparency
10 of the embodiments there's a three-layered approach $10$ as possible and therefore a preferred	l embodiment only
described and this paragraph says quote "In one 11 one foil is used "	emodulinent only
$\mathbf{F}$ <b>ANAWATTAAL ATAL THATATATATATATATATATATATATATATATATATATA</b>	
12 embodiment the transparent sensor is built up of three 12 So this appears to be a second	embodiment
embodiment the transparent sensor is built up of three 12 So this appears to be a second of different layers implemented on three different foils 13 where there's only one foil rather the	embodiment
embodiment the transparent sensor is built up of three 12 So this appears to be a second of different layers implemented on three different foils. Two layers are used for two grid of lines. One for 14 correct?	embodiment an three foils;
<ul> <li>embodiment the transparent sensor is built up of three</li> <li>different layers implemented on three different foils.</li> <li>Two layers are used for two grid of lines. One for</li> <li>the X axis and one for the Y axis and the third layer</li> <li>MR BARTLETT: Objection:</li> </ul>	embodiment an three foils;
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