

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

MIANYANG BOE OPTOELECTRONICS TECHNOLOGY CO., LTD.; TCL
CHINA STAR OPTOELECTRONICS TECHNOLOGY CO., LTD.; TIANMA
MICROELECTRONICS CO. LTD.; AND VISIONOX TECHNOLOGY, INC.,

Petitioner,

V.

SAMSUNG DISPLAY CO., LTD.,

Patent Owner.

Case No. IPR2023-00987

U.S. Patent No. 9,818,803

REPLY DECLARATION OF P. MORGAN PATTISON, PH.D.

I, P. Morgan Pattison, Ph.D declare as follows:

I. INTRODUCTION

1. I have been retained by Mianyang BOE Optoelectronics Technology Co., Ltd. (“BOE”) as an independent expert consultant in this proceeding before the United States Patent and Trademark Office (“PTO”). I am not an employee of BOE or any affiliate or subsidiary of BOE

2. I have been asked to reply to certain of the opinions set forth in a April 1, 2024 declaration signed by Ioannis Kymissis, Ph.D that I understand was submitted by Patent Owner in an *inter partes* review proceeding relating to U.S. Patent No. 9,818,803, which I refer to herein as the ’803 patent.

3. I am being compensated at my standard rate for my time. My compensation is based solely on the amount of time that I devote to activity related to this case and is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this or any other proceeding. I have no other financial interest in this proceeding.

4. The prior declaration I submitted in connection with this proceeding, which I understand has been designated as Ex. 1003, sets forth among other topics my educational background and professional experience (Ex. 1003, ¶¶ 5-16), my understanding of the law (*id.*, ¶¶ 21-36), the ’803 patent’s effective filing date and the knowledge and characteristics of a person having ordinary skill in the art (*id.*, ¶¶

37-43), and claim construction (*id.*, ¶¶ 79-82). As I have already addressed these topics, I do not repeat them here.

5. In forming the opinions set forth in this declaration, I have considered and relied upon my education, knowledge of the relevant field, knowledge of scientific and engineering principles, my work with those of skill at the time of the alleged invention, and my general experience in the field of art. I have also reviewed and considered Ex. 2009 (the Declaration of Ioannis Kymissis, Ph.D.), exhibits 2011-2029, 2033-2067, and 2069-2081 (to the extent cited and discussed in Ex. 2009), and the following additional materials:

Exhibit	Description
1016	U.S. Patent No. 5,644,327 to Onyshevych

II. A POSITA WOULD NOT HAVE CONSIDERED MATTHIES LIMITED TO JUST PASSIVE MATRIX DISPLAYS.

6. Dr. Kymissis repeatedly characterizes Matthies as limited to just “PMOLED displays.” *E.g.*, Ex. 2009, ¶ 106.

7. I disagree that Matthies is limited in this way.

8. To begin, Matthies repeatedly explains that its teachings—including the various pixel arrangements it discusses—are usable with both passively and actively driven displays.

9. For example, according to Matthies, its “display” can be either “active or passive” (Matthies, 7:15-19) and may employ either “active” or “passive ... circuits” (*id.*, 7:42-45).

10. Similarly, Matthies explains that its display’s “pixel driving circuitry” can be either “active and passive.” *Id.*, 8:21-23.

11. Indeed, Matthies even unambiguously states that “active matrix circuits” can be used when implementing its invention. *Id.*, 8:20-33.

12. Next, just like Matthies, other prior art similarly expresses that the passive and active-matrix displays can employ the same pixel layout. *See, e.g.*, Ex. 1011, ¶¶ [0008], [0022], [0025], [0076] (discussing “pixel/sub pixel arrangements” that are usable with “active” or “passive matrix” OLEDs, or even a “LCD”); Ex. 1014, Abstract, ¶ [0043] (discussing “sub pixel ... groupings” usable with LCD, AMOLED, and plasma); Ex. 1015, 1:7-10, 5:53-56 (discussing pixel “patterns” usable with “active” and “passive matrix” “OLED[s]”); Ex. 2011, 1:8-10, 4:10-17 (discussing pixel designs usable with “most OLED device configurations” including “passive” and “active-matrix” OLED “displays”); Ex. 2021, ¶¶ [0001], [0009] (discussing pixel “arrangements” usable with both “passive” and “active matrix OLED devices”).)

13. Moreover, it was also known that square pixels formed from four sub-pixels like that shown in Figure 8B of Matthies are usable in an active-matrix OLED

display. One example of this can be found in Ex. 2011 (a prior art patent to Arnold). Arnold relates to an “improved OLED color display device.” *Id.*, Abstract. Arnold includes examples of pixel arrangements for such a device. Figure 5 is one such example and shows a pixel formed from four sub-pixels arranged in a square. *Id.*, Fig. 5. According to Arnold, its “invention can be employed in most OLED device configurations” including “active-matrix displays.” *Id.*, 4:10-21.

14. There is also nothing about Matthies’ use of vias (or anything else about the structure of its display) that would prevent that display from being implemented as an active-matrix display.

15. Indeed, because it locates certain circuitry on a different surface from that including the display electrodes and pixel forming active organic material—and facilitates interconnection between the electrodes and the circuitry through the vias—a POSITA would have recognized that Matthies would readily be able to accommodate various different display configurations, including active-matrix driven displays. The use of another surface frees up more space and provides additional design flexibility.

16. U.S. Patent No. 5,644,327 to Onyshevych (Ex. 1016)—which Matthies incorporates by reference (*see* Matthies, 2:11-15) provides an example of this. Onyshevych relates to an “electroluminescent display formed on a ceramic substrate.” *Id.*, Abstract. According to Onyshevych, “FIG. 6” depicts a “completely

active drive of the display.” *Id.*, 6:64-7:18. As shown, “[a] plurality of tapered interconnects” in the form of “electrical vias” “connect the display elements to the driver devices” and various “wirings.” *Id.* A POSITA would have understood that when Matthies’ display is implemented as an active-matrix display—which Matthies itself contemplates—Matthies vias could similarly facilitate connection to, for instance, a select line, data line, common power line, and/or ground line located on the backside of Matthies’ tile.

III. A POSITA WOULD HAVE CONSIDERED IT OBVIOUS TO APPLY YAMADA TO MATTHIES

17. Dr. Kymissis argues that a POSITA would not have applied Yamada’s teachings and resized Mathies’ pixels because doing so would purportedly have “reduced” the lifetime of Matthies’ display. *E.g.*, Ex. 2009, ¶¶ 136-139.

18. I disagree with Dr. Kymissis. A POSITA would have been motivated to re-size Matthies’ pixels and would have recognized that doing so would have been beneficial.

19. As an initial matter, Dr. Kymissis appears to have taken the demonstrative figure from my prior declaration literally. This figure (*see, e.g.*, Ex. 1003, ¶¶ 225-229) was meant to provide an example of how a POSITA would have applied Yamada’s teachings to Matthies.

20. A POSITA would of course be able to tailor the sizes of the display's blue, red, and green pixels to achieve any desired balance between display lifetime and brightness.

21. Moreover, a POSITA would have readily recognized that other physical constraints—such as the need for intervening driving circuitry—would also play a role in the appropriate sizing of pixels.

22. Next, I disagree with Dr. Kymissis's opinion that increasing the size of Matthies' blue pixels would have “frustrated Matthies' goal of eliminating the visibility of seams between tiles” and “could reduce space necessary for vias and other circuitry....” Ex. 2009, ¶ 138.

23. Matthies employs a “black matrix” or “black stripes” located on top of a display's glass substrate. Matthies, 21:48-22:7; Fig. 19.

24. The black stripes/matrix are sized such that they both “hide the gap” between tiles and “avoid blocking light from the pixels.” *Id.*, 24:16-28.

25. Matthies explains that the black stripes/matrix must be large enough to cover the maximum “lateral distance” light can travel within the glass substrate and still exit the top surface of the substrate. *Id.*, 23:19-29.

26. This lateral distance is a function of, among other things, the glass thickness. *Id.*

27. In one example, Matthies employs a “thickness of ... glass” that “is 0.15 times P.” *Id.*, 24:21-23. This leads to a required “width of the black stripe” that is “0.25 times the pixel pitch.” *Id.*

28. If, however, the glass is made thinner—for instance, 0.1 times P—the required black stripe width would be reduced. This would in turn allow for larger pixels, including blue pixels with a width exceeding 0.25 of the total pixel pitch.

29. A POSITA, in my opinion, would have been readily able to balance these various factors—including glass thickness, pixel size, and black stripe width—to optimize an OLED display. Put another way, a POSITA would consider the size of the blue pixel—including whether a blue pixel with a width of exactly 0.25, more than 0.25, or less than 0.25 of the pixel pitch is employed—to be nothing more than a design choice.

30. Thus, in my opinion, when implementing Matthies a POSITA would have considered various different pixel sizes, while keeping in mind the art’s teachings that the blue, red, and green pixels be appropriately sized relative to each other (with the blue pixel largest and the green pixel smallest), along with other obvious design requirements including that the pixels fit within the physical confines of the display, emit the appropriate amount of light, and cooperate to generate an appropriate blend of color.

31. I also disagree that use of larger blue pixels would “reduce the space necessary for vias and other circuitry in Matthies’ tile display” as Dr. Kymissis argues. *E.g.*, Ex. 2009, ¶ 138.

32. While blue pixels would be made larger following Yamada’s teachings, the green and red pixels would simultaneously be made smaller.

33. Because the green and red pixels surround the blue pixels—and because there are twice as many of the smallest green pixels—there would be more than adequate space for Matthies’ required vias and other intervening circuitry.

34. Next, in my opinion, Dr. Kymissis is wrong when he argues that the life of Matthies’ display would not be improved by reducing the sizes of the red and green pixels as exemplified in my demonstrative. *See, e.g.*, Ex. 2009, ¶ 136.

35. The aging (and life) of the blue pixels is not the only relevant parameter that bears on the life of an OLED display.

36. Among other things, OLED display life is also dictated by how the display’s pixels age relative to each other.

37. Showing this, Yamada explains that if increased “load is selectively placed” on a subset of pixels, their “deterioration” is “accelerated” relative to the other pixels. Yamada, 3:62-4:14; *see also* 5:4-8.

38. This not only increases the risk of individual pixel failure, but it also decreases the display's overall "service life" by making it more difficult to maintain color or "white balance." *Id.*, 11:48-55.

39. Similarly, Yamada explains that application of larger currents to certain pixels both "causes the life of those display pixels ... to shorten" and impacts overall "life of the EL display apparatus." *Id.*, 2:64-67.

40. So, resizing OLED pixels in accordance with emission efficiency has two effects. First, it can prevent less efficient blue pixels from failing earlier. Second, it also prevents different pixel aging rates from impacting display usability over time.

41. This same concept is also discussed in other prior art.

42. For instance, another reference cited in by my prior declaration (Ex. 1015, Cok) explains that by resizing an OLED display's pixels, the "light emitting elements will age at approximately the same rate..." *Id.*, 4:32-37. Cok explains that by sizing the pixels such that they age similarly, "color shift experienced by prior-art OLED display devices" when pixels age differently is avoided. *Id.*, 4:43-45.

43. Further, another reference cited by Dr. Kymissis (Ex. 2011, Arnold) similarly explains that "[t]o maintain a well-balanced, full color display, it is important that the relative luminance of the three-colored materials be maintained throughout the lifetime of the display." *Id.*, 1:50-56. Arnold, like both Yamada and

Cok, explains that relatively resizing a display's pixels improves a display's "useful lifetime" by "maximiz[ing] the time that the relative luminance of the three-color elements can be maintained...." *Id.*, 2:1-4.

44. I have reviewed Dr. Kymissis's opinions and do not believe that he addresses this effect. Instead, he appears to argue only that if Matthies' blue pixels are not increased from their original size, those pixels will not themselves have a longer life.

45. Again, as I have explained, the useful life of an OLED display is dictated not only by the lifetimes of the individual pixels, but also by how long proper color and white balance can be maintained.

46. By applying Yamada's teachings, and resizing Matthies' pixels, a POSITA would have understood that Matthies' pixels would all age at or near the same rate. This would be an improvement over Matthies' existing design, where the pixels have the potential to age at different rates.

47. By causing the pixels to age at similar rates, the display's color/white balance would be less likely to drifting apart over time. This would in turn improve the usable lifetime of Matthies' display.

48. In my opinion, Dr. Kymissis also fails to account for fact that the material typically used to form green pixels is many times more efficient and longer lived than that employed to form blue pixels. *See, e.g.*, Ex. 2011, Arnold, Fig. 10.

Thus, while applying greater current density will reduce the lifetime of the green pixels, given that green pixels are much longer lived, reducing their size and applying a higher current density will not cause those pixels to fail prior to the blue pixels..

49. I also disagree that resizing Matthies' pixels will produce any sort of "shadowing effect." According to Dr. Kymissis, Matthies' "larger pixels would have more of their light emission blocked by the black stripes of mullions ... than the smaller pixels." Ex. 2009, ¶ 181.

50. Matthies is already designed to avoid this very effect.

51. In particular, as I note above, Matthies' mullions and black stripes are sized such that they "avoid blocking light from the pixels." Matthies, 24:7-19.

52. The "mullions" also "ensure that the mullion does not create artifacts on the display device." Matthies, 22:41-44. To this end, the "top surface of the mullion" between tiles "closely match[es] the black stripes" between pixels within tiles "in size, color and gloss." *Id.*

53. Further, to avoid producing a "band of reduced brightness in the displayed image," the mullions are structured to ensure that "any light scattered in the vicinity of the mullion has the same properties as light that is scattered among pixels to the interior of a tile." *Id.*, 22:49-56. This can be accomplished by making the "bottom stem of the mullion ... light-colored or transparent." *Id.*

54. As the mullions/black stripes do not block any light emitted by (and avoid shading of) Matthies existing same-sized pixels, they will also not have this effect if the green and red pixels are made relatively smaller following Yamada's teachings.

IV. A POSITA WOULD NOT HAVE CONSIDERED RESIZED PIXELS TO BE INCONSISTENT WITH MATTHIES

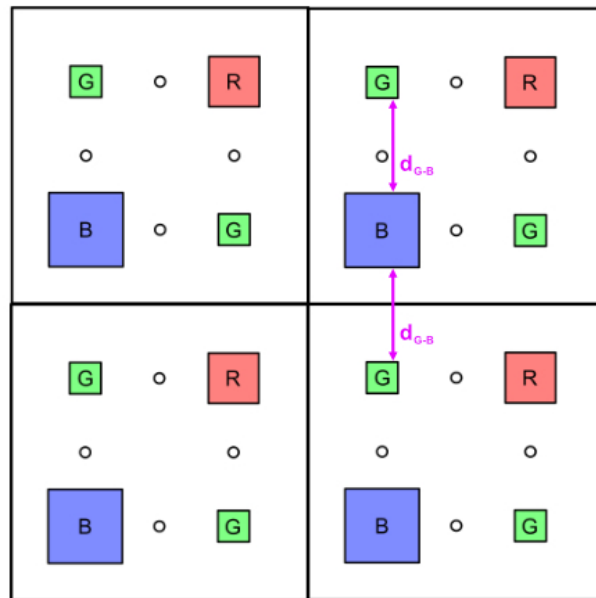
55. Dr. Kymissis also opines that "Matthies repeatedly stresses the importance of ensuring that pixels are spaced such that the distance from each pixel to the edge of the tile is the same...." Ex. 2009, ¶ 131.

56. Matthies does not require that space between a sub-pixel and tile edge always be exactly the same. Instead, Matthies only requires that the "distance between ... pixels of two adjacent tiles" be "the same as the ... distance of adjacent pixels in the interior of a tile." Matthies, 5:49-53; *see also* 8:39-41.

57. This makes logical sense: Matthies does not want the seams between its tiles to be visible. Thus, it teaches that pixel spacing should be the same both within a particular tile and between adjacent tiles. What this means is that there should be no extra space between tiles that would lead to pixels being differently spaced within and between tiles.

58. In my opinion, the combination of Matthies and Yamada satisfies this requirement.

59. As shown by the below demonstrative, the pixels are spaced the same within and between tiles. Two example distances are highlighted. As shown, the distance between blue and green pixels in the upper right most tile is d_{G-B} . The distance between the blue pixel and the green pixel in the immediately adjacent tile is also d_{G-B} :



V. PHAN TEACHES REGULARLY SPACED PIXELS

60. Dr. Kymissis also opines that a POSITA reading Phan would understand there to be “spaces between the quad pixels” that are repeated to form Phan’s display. Ex. 2009, ¶¶ 219, 221.

61. I disagree: this is not how a POSITA would interpret Phan. In every one of Phan’s figures, the differently colored dots making up Phan’s pixels are evenly and regularly spaced. *See, e.g.*, Phan, Figs. 2a, 2b, 7, 9-9.8, 12-12d.

62. In my opinion, Figure 12 of Phan is no different. This figure is not meant to show “gaps” or “spaces” between Phan’s static pixels. Instead, the boxes surrounding groups of four dots are simply meant to label—not show the physical bounds of—the various different static pixels 17 making up the display.

63. Further, a POSITA would have understood that Dr. Kymissis’s interpretation of Phan would create various problems.

64. Phan explains that its “static pixel[s] 17” and the “dynamic pixel[s] 18” have the same “matrix” “geometry.” Phan, 6:4-23. A POSITA would understand—based on Phan’s overall disclosure—that both are intended to be arranged in “pixel groups” form a “square.” *Id.*, 7:59-67.

65. And once again, in every one of Phan’s figures, the dynamic pixels have the same shape and geometry across the display. *Id.*, Figs. 2a-2b, 4a-4b, 5, 7, 8-8.12, 9-9.8, 12a-12-d.)

66. Figure 9 provides one example. This figure labels eight overlapping dynamic pixels 18 with circles and one static pixel 17 with a square. As shown, each such static and dynamic pixel is exactly the same size:

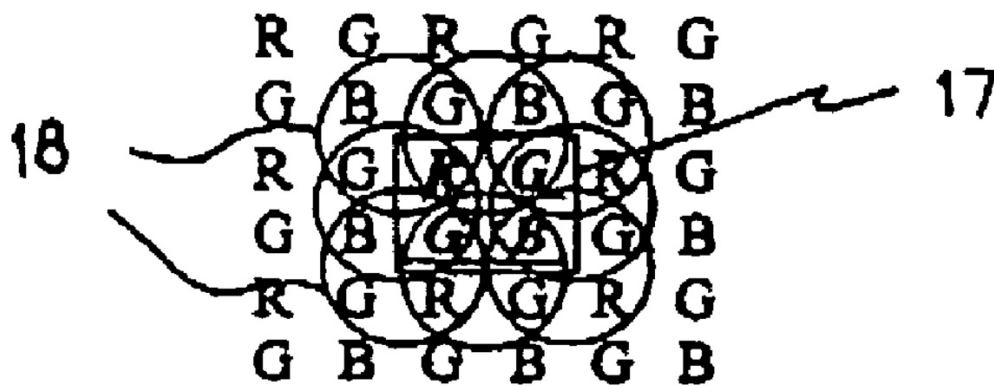


FIG. 9

Id., Fig. 9.

67. A POSITA would have understood this use of same-sized dynamic pixels to be purposeful. Phan explains that by employing dynamic pixels that “overlap[]” the “static pixels” a display’s “given grid” to have an “enhanced” or “higher” “resolution.” *Id.*, Abstract, 2:51-53.

68. In other words, Phan display includes not only static pixels, but many dynamic pixels that are the same size as the static pixels for purposes of increasing the display’s effective resolution.

69. Dr. Kymissis, however, interprets Phan in a way that would frustrate this purpose.

70. Rather than having same-sized dynamic pixels that increase display resolution by supplementing the static pixels, by adding space between the static

pixels Dr. Kymissis produces a display that includes differently and irregularly sized and shaped dynamic pixels.

71. This is shown below, with four differently sized and shaped dynamic pixels circled in red, blue, green, and purple:



FIG. 12

72. In my opinion, given the function of the dynamic pixels—to increase the display’s resolution—a POSITA would have recognized that the dynamic pixels must have the same size across the display.

73. A POSITA would have recognized that sizing the dynamic pixels differently as Dr. Kymissis does presents numerous issues.

74. For example, perceived brightness would vary from pixel-to-pixel, with the larger dynamic pixels appearing dimmer because they emit the same amount of light but cover a larger physical space.

75. Next, the differently shaped pixels will look different to a user resulting in display distortion. Displays are formed with an array of same shaped—not differently shaped—pixels to avoid this effect.

76. Further, added space to certain dynamic pixels but not others would reduce the visual blending of the differently colored dots and increase the risk that the dots would be separately visible in the dynamic pixels with the added space.

77. Finally, rather than creating a uniform increase in display resolution across the display, there would be variations in display resolution at different locations due to the differently sized dynamic pixels.

78. In my opinion, this would all be contrary to Phan’s teaching that its dynamic pixels are meant “not to be perceivable by the human eye.” Phan, 2:57-59.

79. Differently sized and shaped dynamic pixels are far more likely to produce visible differences than pixels that have uniform sizes and shapes across the display. The added space also frustrates Phan’s primary purpose of increasing display resolution within a given amount of space (the space added by Dr. Kymissis positions the pixels further apart, reducing the display’s density and effective resolution).

80. I also disagree with Dr. Kymissis’s argument regarding the supposed “visual locus” of Phan’s pixels. *See, e.g.,* Ex. 2009, ¶¶ 227-229.

81. To begin, Dr. Kymissis cites to no support for his understanding of Phan's "visual locus." He points to no articles, texts, or other background information. He has also performed no calculations. Instead, his opinions appear to be premised solely on speculation.

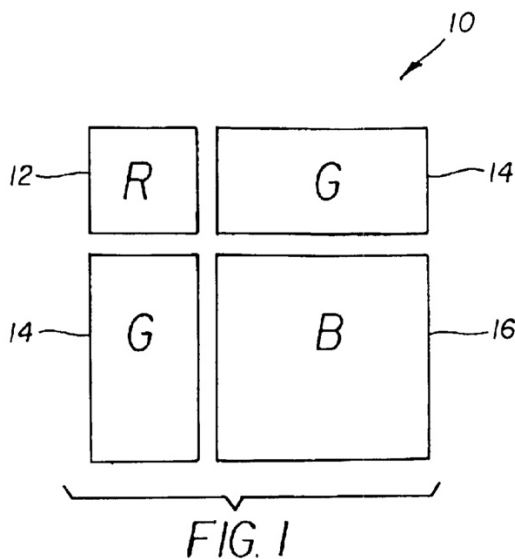
82. While it is true that the human eye is more sensitive to the color green, this does not cause the "visual locus" of an OLED pixel to move from the center of a pixel to another location. Instead, it simply causes the green pixels to appear brighter. The center of the pixel will still appear at the geometric center of the shape formed by the four sub-pixels (which in Phan's Figure 11b form a square). Dr. Kymissis's opinion that some sort of positional shifting of the "visual locus" occurs is, in my opinion, not correct.

83. Dr. Kymissis also appears to misunderstand my opinion explaining that "a POSITA would have understood that there already is space (even if not depicted) between" Phan's "pixels to allow for ... intermediate signal lines." Ex. 1003, ¶ 428.

84. I did not state that there would be variable, different amounts of space between the various dots making up Phan's display. Instead, the same amount of space would be present between all the dots. My only point was that a POSITA would have understood that the dot-to-dot spacing in Phan could obviously be greater than the dimension of the black line shown between red, green, and blue dots in Figures 10a-11b of Phan.

85. Showing this, the Cok reference (Ex. 1015) provides examples of various pixel arrangements for an “OLED display device.” *Id.*, 2:15-16.

86. The below figure from Cok provides one example of a “pixel pattern 10” with a “square pixel arrangement” meant for use with such an “OLED display.” *Id.*, 4:8-26.



Id., Fig. 1.

87. As can be seen, the red, green, and blue dots are separated by small, generally equal amounts of space. As I previously explained, a POSITA would have understood that Phan’s pixels could be structured in a similar fashion.

VI. DR. KYMISSIS HAS NOT TIED ANY SECONDARY CONSIDERATIONS TO THE CLAIMS

88. Dr. Kymissis also points to various “secondary considerations” in an effort to show that the claims are not obvious.

89. I understand that for such considerations to be pertinent, there must be a nexus between the considerations and the claimed subject matter. In my opinion, there is no such nexus in this case.

90. Each of the various secondary considerations referenced by Dr. Kymissis are discussed below.

A. “*Long-Felt ... Need*”

91. According to Dr. Kymissis, there was purportedly a “long-felt” need for “full HD” “AMOLED displays for mobile devices such as smartphones and tablets.” *E.g.*, Ex. 2009, ¶ 313.

92. None of the ‘803 patent’s claims, however, require AMOLED displays, mobile devices, or even a pixel arrangement that provides full HD resolution.

93. Moreover, the specification similarly does not discuss active-matrix displays (or even limit the patent to such displays), mobile devices, or increased (let alone HD) resolution.

94. Thus, to the extent there was a need for the type of device Dr. Kymissis references, that need was not met by the ‘803 patent.

95. The ‘803 patent generically claims a pixel arrangement for an OLED display. For purposes of the claims, it does not matter if the arrangement is part of an active-matrix driven display, a mobile device, or a display that can be classified as high-definition.

96. When the '803 patent was filed, pixel arrangements for OLED displays were known and in wide-spread use. All the '803 patent did was articulate one such (already known) pixel arrangement design choice.

97. Dr. Kymissis also notes that the '803 patent somehow overcame “manufacturing challenges with OLEDs.” *E.g.*, Ex. 2009, ¶ 322. While the '803 patent specification does state that a “fine metal mask (FMM)” “may” be used to form an “OLED” pixel (*e.g.*, Ex. 1001, 1:38-40), it does not require the use of this method. The claims are directed to a pixel arrangement and are agnostic to the manufacturing method employed. Moreover, besides generically referencing a “fine metal mask,” the patent provides no information regarding how this method is to be used or any purported improvements to this particular manufacturing method.

B. “*Industry Skepticism*”

98. Just as he did when discussing the purported “long-felt need,” Dr. Kymissis argues that there was “skepticism” that a “full HD AMOLED display” with “high resolution” and “high pixel density” could be achieved. *See, e.g.*, Ex. 2009, ¶ 326.

99. As I have explained, none of this is required by the '803 patent: the patent neither claims nor discloses an AMOLED display, a full HD display, or a display with “high pixel density.”

100. Instead, the patent is generically directed to a “pixel arrangement” for use with any OLED display, including both active and passive displays and displays that provide either lower or higher resolution.

101. There was no skepticism that such a display was achievable. Instead, at the time the ’803 patent was filed, numerous such displays were not only known but were commercially available.

102. As summarized below, this is reflected in numerous of the exhibits cited by Dr. Kymissis:

- Ex. 2016 at 1: noting that “AMOLED” mobile devices were “considered to be realistic” by 2006;
- Ex. 2019 at 14: explaining that “OLEDs” “show[ed] promise” for “mobile devices” by 2008;
- Ex. 2020 at 3, 7: noting that “AMOLED ... displays” were “successfully commercialized” by 2010;
- Ex. 2023 at 1: referencing various commercial AMOLED mobile devices available in 2010;
- Ex. 2025 at 2: identifying and discussing various “impressive” OLED mobile devices available in 2010;
- Ex. 2039 at 2: noting that “displays using ... OLEDs” appeared in “Smartphones” by 2010; and

- Ex. 2074 at 15: noting that “OLED technology” in 1998 met “standards for luminance and contrast.”

103. These exhibits do not show skepticism. Instead, they show that the art was optimistic about the use of OLED technology.

C. *“Failure of Others”*

104. Dr. Kymissis’s opinions that others purported “failed” to achieve “commercial AMOLED displays for mobile devices that would enable higher resolution and pixel densities” likewise are disconnected from what the ‘803 patent discloses and claims.

105. Once again, the claims do not require AMOLED displays, mobile devices, higher resolution, or any particular pixel density.

106. And as I have explained in the section immediately above, there were numerous examples of successful, available OLED displays in the prior art.

107. In fact, in the very section of his report discussing purported “failure,” Dr. Kymissis points to numerous working, commercially available OLED displays. This includes, for instance, the “Samsung Galaxy S product” with a “Pentile arrangement,” the “Samsung Galaxy S2 product” with an “RGB Stripe arrangement,” and a “LG Display” employing a “shared emitting aperture” arrangement. Ex. 2009, ¶¶ 331-332.

D. “Industry Praise”

108. Dr. Kymissis next argues that there was “industry praise” of the ’803 patent.

109. But here he references various smartphone products, including the iPhone X and Samsung Galaxy S4. *See* Ex. 2009, ¶¶ 336-339.

110. The ’803 patent’s claims are not directed to a smartphone. They are directed only a pixel arrangement. A smartphone includes many features that have nothing to do with the ’803 patent, including a processor, memory, a user interface, controlling software, and a stylized form factor.

111. The exhibits cited by Dr. Kymissis confirm that any link between the success of the iPhone X and the Samsung Galaxy S4 (or any other smartphone) and the ’803 patent is either non-existent or extraordinarily weak. In fact, not only do these exhibits show that there are numerous non-display reasons why these products were successful, but they also show that display performance is premised on a variety of factors that are disconnected to the particular pixel arrangement employed.

112. For example, one of Dr. Kymissis’s exhibits explains that “[w]hat makes the iPhone X the Best Smartphone display is the impressive Precision Display Calibration Apple developed.” Ex. 2039, 2.

113. The same exhibit notes that various other display features, such as lower “screen reflectance,” “high dynamic range,” “night shift mode,” “true tone

viewing,” “super dim setting,” and “viewing angle performance” are also important. *Id.*, 3-5.

114. With respect to the Galaxy S4, Dr. Kynmissis’s exhibits explain that “enhancements of the circuit structure” allowed improved “contrast ratio,” “power consumption was reduce,” “outside visibility” was increased, and the display “became thinner” with a reduced “bezel.” Ex. 2037, 4.

115. Once again, none of this has anything to do with the ’803 patent. So, while Dr. Kynmissis has pointed to exhibits praising the performance of the certain smartphone products employing Samsung displays, what he has not done is shown that it is the ’803 patent’s pixel arrangement that resulted in that praise. Instead, any praise was the result of other, unclaimed features and product characteristics.

E. *Purported “Copying”*

116. Dr. Kymissis also alleges that there has been “widespread” copying of the ’803 patent. However, in doing so, he does nothing more than (1) allege infringement and (2) compare product images. *E.g.*, Ex. 2009, ¶¶ 340-346.

117. I understand that evidence of copying alone is not necessarily a strong indicator of non-obviousness because there could be numerous explanations for such behavior, many of which are irrelevant to determining whether claimed inventions are or are not obvious.

118. Because of this, in my opinion, Dr. Kymissis’s analysis of purported “copying” is incomplete. He focuses solely on superficial similarity, without considering anything else about the nature and origin of the products he references.

F. *Purported Commercial Success*

119. Dr. Kymissis has not alleged or identified any purported “commercial success” allegedly experienced by the ’803 patent.

120. I agree that there is no evidence in the collection of exhibits that both I and Dr. Kymissis considered indicating that any product has been successful due to the use of the ’803 patent’s subject matter. While those exhibits do reference successful smartphone products, any such success obviously resulted from many factors that have nothing to do with the patent’s claims.

121. Moreover, it should be noted that certain of the exhibits Dr. Kymissis cites even note that the “full-HD” and increased “pixel density” supposedly provided by the products purportedly practicing the ’803 patent is unnecessary and does little more than facilitate marketing puffery: “it is absolutely pointless to further increase ... display resolution”; this is a “silly marketing wild goose chase ... with no visual benefit.” Ex. 2039, 3.

122. In sum, reviewing the totality of the evidence of “secondary considerations” pointed to by Dr. Kymissis and weighing it along with evidence I previously considered showing the obviousness of the ’803 patent’s claimed subject

matter, my opinion remains the same: any connection between the considerations and the claims is non-existent or weak and a POSITA would still have considered the claims obvious over the prior art.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willfully false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1101 of Title 18 of the United States Code.

Date: June 23, 2024

Location: Ringgold, GA

Signature: 
P. Morgan Pattison, Ph.D