

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MOTOROLA MOBILITY LLC, AND GOOGLE, LLC

Petitioners,

v.

MULTIFOLD INT'L INC. PTE. LTD.,

Patent Owner

Case No.: IPR2025-00040

U.S. Patent No. 9,134,756

Issue Date: September 15, 2015

Title: Dual Screen Application Visual Indicator

**DECLARATION OF JEFFREY J. RODRIGUEZ
IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 9,134,756**

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I, Jeffrey J. Rodriguez, declare as follows:

I. INTRODUCTION

1. I have been retained by counsel for Petitioner, Motorola Mobility LLC as an expert in this *inter partes* review to examine whether claims 1-9 of U.S. Patent No. 9,134,756 (the '756 patent or Patent in Suit) are patentable over certain prior art.

2. I am being compensated for my work in this matter at my usual consulting rate for the time I spend on this matter. Neither my engagement nor my compensation depends on the particular opinions I express, the testimony I give, or the outcome of this or any other proceeding. I have been informed that the alleged owner of the '756 patent is Multifold Int'l Inc. Pte. Ltd. ("Patent Owner"). To the best of my knowledge, I have no financial interest in Patent Owner or Petitioner.

3. I expect to be available for deposition and to testify at the evidentiary hearing in this *inter partes* review to the extent required.

4. This declaration contains my conclusions and a summary of my analysis including a summary of my conclusions; an overview of my qualifications as an expert; an overview of the scope and terms of my engagement for this declaration; an overview of the materials I have considered in arriving at my conclusions; an overview of the terminology and legal principles that I applied in my analysis; an overview of the technical background of the subject matter; an overview of the Patent in Suit; an

analysis of the level of ordinary skill in the art related to the Patent in Suit; an analysis of the asserted references; and a patentability analysis of the challenged claims.

5. This declaration is based on information currently available to me. I intend to continue my investigation and study, which may include a review of documents and information that may yet be produced, as well as deposition testimony from depositions for which transcripts are not yet available or that may yet be taken in this review. Therefore, I expressly reserve the right to expand or modify my opinions as my investigation and study continue, and to supplement my opinions in response to any additional information that becomes available to me, any matters raised by Petitioners or Patent Owner and/or other opinions provided by their expert(s), or in light of any relevant orders from the Patent Trial and Appeal Board or other authoritative body.

II. QUALIFICATIONS, PUBLICATIONS, AND PRIOR TESTIMONY

6. I am a professor at The University of Arizona in the Department of Electrical & Computer Engineering, where I hold or have held the following positions: (a) Associate Professor of Electrical & Computer Engineering, with tenure (1997–present), (b) Associate Professor of Biomedical Engineering, with tenure (2017–present), (c) Director of ECE Online Programs (2023–present), (d) Director of the Signal and Image Laboratory (1990–present), (e) Director of Image Analysis, Cancer Imaging Shared Services, Arizona Cancer Center (2009–2014), (f) Co-Director of

Connection One, a National Science Foundation industry/university cooperative research center for wired and wireless communication circuits and systems, (g) Director of Graduate Studies for the Department of Electrical & Computer Engineering (2000–2003, 2005–2016).

7. My formal education includes a Bachelor of Science degree in Electrical Engineering from the University of Texas at Austin in May 1984, a Master of Science degree in Electrical Engineering from the Massachusetts Institute of Technology in June 1986, and a Ph.D. Degree in Electrical Engineering from the University of Texas at Austin in May 1990.

8. I teach courses at both the graduate and undergraduate level through the Dept. of Electrical & Computer Engineering and the College of Optical Sciences. The courses I have taught include Digital Image Processing, Digital Image Analysis, Digital Signal Processing, Advanced Digital Signal Processing, Signals and Systems, and Circuit Analysis. I have been awarded the Outstanding Teaching Award by the IEEE and Eta Kappa Nu (IEEE-HKN), given by students at The University of Arizona to one outstanding professor each year.

9. My research activity focuses on systems for digital signal/image/video processing and analysis. My research activities include automated algorithms for detection/analysis/classification of objects using machine learning and conventional methods, efficient management of large image databases for training machine learning

systems, quality assessment of medical image display devices, and applications in medical image analysis, automobile tracking, driver distraction detection, animal species classification, and real-time video processing for motion analysis.

10. One project involved determining the modulation transfer function (MTF) of medical image display devices. The prior methods typically involved measuring the response to square waves, white noise, and/or line stimuli, but these methods can be tedious and sensitive to noise. We proposed two novel methods: (1) subtracting a shifted edge-spread function from the edge-spread function followed by Fourier analysis, and (2) applying a low-pass differentiator to the edge-spread function followed by Fourier analysis. Experimental performance analysis demonstrated that the new methods were less labor-intensive and reduced the high-frequency noise associated with prior methods.

11. Another project involved the design and development of a real-time image and video processing system for automated detection and behavioral analysis of zebrafish for use in ototoxicity assessment of drugs. The system we designed and built includes an array of Raspberry Pi microcomputer systems configured for parallel video capture of sixteen zebrafish populations. Each Raspberry Pi features a system on a chip, which includes a CPU, a video graphics processing unit (GPU), a disk storage system, and a memory system. Our zebrafish analysis system includes hardware and software to automatically capture and transmit compressed MPEG video data to a local

personal computer or to a high-performance computing cluster to decode the video and implement customized algorithms for detection of zebrafish pose and motion using multi-scale edge map analysis, resulting in automated assessment of zebrafish swimming behavior.

12. I am a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) and the IEEE Signal Processing Society. I served as Treasurer of the 2024 IEEE Southwest Symposium on Image Analysis and Interpretation (SSIAI), General Chair of SSIAI 2016, and General Chair of the 2007 IEEE International Conference on Image Processing (ICIP). In addition, I served on the IEEE Signal Processing Society Technical Committee on Image, Video, and Multidimensional Signal Processing (2005–2011) and served as Associate Editor of the *IEEE Transactions on Image Processing* (1996–2000). Over the years, I have served on numerous other professional committees, and I have served as a technical reviewer for numerous journals and professional conferences.

13. I am named as an inventor on a patent involving polar dynamic programming for automated image segmentation. I have authored or co-authored over 140 technical publications. Over the past 30 years, I have trained hundreds of students in signal/image/video processing, including directing the research of numerous graduate students, resulting in more than 50 graduate theses and dissertations. I have served as an expert in patent cases since 2005, involving signal/image/video

processing, data compression systems, video receivers, document cameras, cellular camera phones, signal/image/video transmission over wireless networks, etc.

14. My current curriculum vitae is attached as Exhibit A, which includes a detailed listing of my education, work experience, honors, awards, professional associations, publications, and a list of expert consulting activities during the past five years in which I have testified as an expert at deposition or trial.

III. MATERIALS CONSIDERED

15. In forming my opinions, I have relied on my own knowledge and experience, including my education, training, and work experience in the field of electrical & computer engineering, my research and teaching experience, my experience in working with others in this field, and my experience in the design, development, and operation of relevant systems. I have considered the following materials:

Exhibit	Description
Ex. 1001	U.S. Pat. No. 9,134,756 to de Paz
Ex. 1002	File History for U.S. Pat. No. 9,134,756 to de Paz
Ex. 1004	U.S. Pub. 2010/0248788 A1 to Yook
Ex. 1005	U.S. Pub. 2008/0085759 A1 to Lee
Ex. 1006	U.S. Patent No. 8,677,284 B2 to Aguilar
Ex. 1007	U.S. Pub. 2007/0084645 A1 to Purcell
Ex. 1008	Features at a Glance - Windows XP Professional Features for IT Professionals, Microsoft Learn (Sep. 11, 2009); available at

	https://learn.microsoft.com/en-us/previous-versions/windows/it-pro/windows-xp/bb490858(v=technet.10) .
Ex. 1009	Asus EEE PC computer review with Windows XP, guerillabill, YouTube (Dec. 28, 2007); available at https://www.youtube.com/watch?v=Z3gHRWXqguw .
Ex. 1010	Curriculum Vitae of Dr. Jeffrey J. Rodriguez

16. I have tried my best to list all the materials I considered and reviewed. I may have accidentally left some materials off the above list that I cited in my analysis below. Such materials, if any, should be included in the above list of materials I considered and reviewed. I reserve the right to supplement, amend, or modify the opinions set forth in this declaration or in any other declaration, report, witness statement, deposition, or in testimony.

IV. LEGAL PRINCIPLES

17. I am not an attorney and offer no legal opinions. For the purposes of this declaration, I have been informed about certain aspects of the law that are relevant to my analysis, as summarized below.

A. Interpretation of Claims

18. I have been advised that, for purposes of this *inter partes* review proceeding, the words of the claims should be given their ordinary and customary meaning according to a person of ordinary skill in the art in question at the time of the invention. I have further been advised that the prosecution history is relevant to

determining the correct construction of claim terms and that extrinsic evidence also may be relevant to establish the meaning of terms to the extent it is consistent with the specification and prosecution history.

B. Anticipation

19. I have been advised that a patent claim is “anticipated” and therefore invalid when a single prior art document describes, or a prior art product includes, every element recited, either expressly or inherently, in the claim. I have further been advised that, to be considered anticipatory, a written prior art reference must be enabling and describe the invention of the claim sufficiently to have placed it in possession of a person of ordinary skill in the field of the invention.

20. I have further been advised that a prior art reference may anticipate a claim without disclosing an element of the claim if that missing element is necessarily present, or inherent, in the single anticipating reference as would be understood by one of ordinary skill in the art. I have been advised that inherency cannot be established by probabilities or possibilities; the mere fact that a certain thing may result from a given set of circumstances is not sufficient.

21. I have been advised that a patent claim is invalid if the claimed invention “was known or used by others in this country ... before the invention thereof by the [patent] applicant.” 35 U.S.C. § 102(a). I have been advised that, to be invalidating, knowledge or use must be accessible to the public. I have been

advised that whether use or knowledge is “public” is a fact-intensive question, the answer to which depends on such factors as whether some or all of the prior use or knowledge was maintained in confidence or as a trade secret, the existence of non-disclosure agreements or other confidentiality obligations imposed on members of the public who observed the use, the number of people involved, and the extent to which the use of the product informs an observer about the features of the claimed invention.

22. I have been advised that a patent claim is invalid if the claimed invention was “patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent” (35 U.S.C. § 102(a)) or the claimed invention was described in “a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent” (35 U.S.C. § 102(e)). I have been advised that the date of “the invention . . . by the applicant” in both § 102(a) and § 102(e) refers to the conception date of the claimed invention by the patent applicant.

23. I have been advised that a reference does not qualify as prior art under § 102(a) or § 102(e) if (1) the inventor conceived of the invention prior to the effective date of the reference and showed reasonable diligence in reducing the invention to practice from a time just prior to the effective date of the reference or (2) the inventor reduced the invention to practice prior to the effective date of the

reference. I have been advised that conception requires an inventor to form in his or her mind a definite and particular idea of a complete and operative invention, including every feature of the claim at issue. I have further been informed that there are two types of reduction to practice: actual reduction to practice (i.e., when all limitations of the claimed invention are embodied in a physical or tangible form that has been sufficiently tested to demonstrate it works for its intended purpose) and constructive reduction to practice (i.e., by the filing of a patent application).

24. I have been advised that a patent claim is invalid if the claimed “invention was patented or described in a printed publication in this or a foreign country . . . more than one year prior to the date of the application for patent in the United States” (35 U.S.C. § 102(b)). I have been advised that, to qualify as prior art, a printed publication must be shown to be accessible to the public (i.e., disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it).

C. Obviousness

25. I have been advised that a patent claim is “obvious” and therefore invalid when the differences between the claimed subject matter and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains.

26. In making an obviousness determination, I have been advised that there are several factors to consider: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art at the time the invention was made; (3) the differences between the claimed invention and the prior art, if any, and (4) objective considerations, if any exist, such as any commercial success, copying, prior failure by others, licenses, longstanding need, and unexpected results.

27. I have been advised that prior art used to show that a claimed invention is obvious must be “analogous art.” Prior art is analogous art to the claimed invention if (1) it is from the same field of endeavor as the claimed invention (even if it addresses a different problem) or (2) the reference is reasonably pertinent to the problem faced by the inventor (even if it is not from the same field of endeavor as the claimed invention).

28. I have been advised that a patent claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was independently known in the prior art, whether those references were set forth in a single reference or in a combination of references. Instead, it must have been obvious to arrange those elements in the same way as the elements in the claim.

29. I have been advised a single reference may be the basis for finding that a claim is obvious. When the obviousness determination relies on the combination of two or more references, however, the patent challenger must show that there is a

reason, suggestion, or motivation that would lead one of ordinary skill in the art to combine prior art references.

30. I have been advised that there is no single way to define the line between true inventiveness on the one hand (which is patentable) and the application of common sense and ordinary skill to solve a problem on the other hand (which may not be patentable). For example, market forces or other design incentives may be what produced a change in the technology of the prior art, rather than true inventiveness. I have further been advised that explicit teachings or suggestions in the prior art to make the modification or combination of elements claimed in the patent may be evidence of obviousness. Further, an innovation may be obvious if it applies a known technique that had been used to improve a similar device or method in a similar way. I have been advised that a claimed invention may be found to be obvious to try if the claimed innovation was one of a relatively small number of possible approaches to the problem with a reasonable expectation of success by those skilled in the art.

31. However, I also been advised that it is improper to engage in hindsight when trying to determine the obviousness of a patent claim. Many true inventions might seem obvious with the benefit of hindsight. I have been advised that the obviousness inquiry must be conducted from the standpoint of a person of ordinary skill in the field at the time the claimed invention was made. What is known today,

and what is learned from the teachings and disclosures of the patent itself containing the claim under analysis, should not be considered. Nor should one use the patent claim as a guide to picking out elements of the prior art for combination.

32. I have been informed that various “secondary considerations” (sometimes referred to as objective indicia of non-obviousness) may support a determination of non-obviousness and that such secondary considerations must be considered as part of an obviousness analysis. I have been informed that secondary considerations of nonobviousness may include:

- commercial success of a product due to the merits of the claimed invention;
- a long felt need for the solution provided by the claimed invention;
- unsuccessful attempts by others to find the solution provided by the claimed invention;
- copying of the claimed invention by others;
- unexpected and superior results from the claimed invention; and
- acceptance by others of the claimed invention as shown by praise from others in the field or from the licensing of the claimed invention.

33. I have been advised that in order for such “secondary considerations” evidence to be relevant to the obviousness inquiry, there must be a relationship or “nexus” between the advantages and features of the claimed invention and the evidence of secondary considerations.

34. I have been advised that if a claim element is not obvious, then the claims that depend from it are not obvious.

V. THE ‘756 PATENT

A. Synopsis of the ‘756 patent

35. The ’756 patent, titled “Dual Screen Application Visual Indicator,” issued to Alexander de Paz on Sept. 15, 2015. The ’756 patent derives from U.S. Patent Application No. 13/247,728 (“Application”), which was filed on Sept. 28, 2011, and from U.S. Provisional Patent Application No. 61/389,087 (“Provisional”), which was filed on Oct. 1, 2010. The ’756 patent is directed to a dual-screen user device and methods for revealing a combination of desktops on single and multiple screens. Ex. 1001, Abstract.

36. The ’756 patent alleges that the disclosed invention addresses “a need for a dual-multi-display handheld computing device that provides for enhanced power and/or versatility compared to conventional single display handheld computing devices.” Ex. 1001, 1:52-55.

37. The ’756 patent identifies a method of organizing windows on a display. The method describes a process whereby two applications are initially displayed, and one of the applications is maximized. *Id.*, 1:60-2:10. The end result is that where two smaller windows were displayed initially, now one larger window occupies the same space. The ’756 patent further claims the “non-transitory computer readable medium

storing computer executable instructions that when executed by at least one processor perform” the method, as well as a dual screen communication device containing the same executable instructions. *Id.*, 2:11-55.

38. The '756 patent sums up its invention in the Abstract:

A dual-screen user device and methods for revealing a combination of desktops on single and multiple screens are disclosed. A determined number of desktops and/or running applications can be selectively displayed on dual screen displays conditioned upon inputs received and the state of the device. Desktop displays and applications can be selectively shifted between the screens by user gestures, and can be moved off of the screens by other user gestures and therefore hidden. The hidden desktops and screens however can be re-displayed by yet another gesture. The desktops and applications are arranged in a window stack that represents a logical order of the desktops and applications allowing a user with an intuitive ability to manage multiple applications/desktops running simultaneously. Visual indicators can be used on the displayed applications and desktops enabling a user to maximize a display on multiple screens or to minimize them on a single selected screen.

B. Prosecution History of the '756 patent

39. I have been informed that during prosecution, Challenged Claims were subject to several rejections during their pendency. In a January 31, 2014 Office Action, the claims were rejected as directed to unpatentable subject matter and rejected

under §102(e) as anticipated by Jones (U.S. Patent Pub. No. 2011/0230178). At the time of the initial rejection, the pending claims all recited a “multi-screen device” and not the currently present “multi-display device.” The applicant argued that Jones used two distinct devices, each with its own screen, and not a single device with two screens. April 30, 2014 Response at 8-9. In an August 27, 2014 Office Action, the examiner again rejected the claims as anticipated by a new reference Clark (U.S. Patent No. 5,835,090). The applicant argued that Clark did not present applications or desktops on separate logical displays and that Clark did not teach revealing an application through its “hidden form” of windows. November 25, 2014 Response at 9-10. A Notice of Allowance with an examiner’s amendment was issued on March 23, 2015.

40. However, I been further informed that, like in Patent No. 9,058,153 (co-petitioned for *inter partes* review), the applicant amended the claims again post-allowance to swap the “multi-screen device” for a “multi-display device.” April 21, 2015 Response. While the applicants stated this did not change the scope of the claims, that was incorrect and contradicted by the specification.

C. Challenged Claims of the ’756 patent

41. My understanding is that Petitioner is requesting *inter partes* review of claims 1-9 (“Challenged Claims”) of the ’756 patent. The claims are recited as follows, where I have added reference labels (P), (A), (B), etc. to individual portions of the claim for convenience:

Limitation	Claim Language
1[P]	A method of displaying a plurality of desktops and/or applications, each having at least one window, on a multi-display device, comprising:
1[A]	receiving, by a processor, a first input that represents an instruction to reveal one of a desktop or application on a first display of the multi-display device; selecting, by the processor, a first desktop or application to display on the first display;
1[B]	receiving, by the processor, a second input that represents an instruction to reveal one of a desktop or application on a second display of the multi-display device; selecting, by the processor, a second desktop or application to display on the second display;
1[C]	receiving, by the processor, a third input that represents an instruction to maximize a selected one of the first or second desktops or applications resulting in the selected one being displayed on both of the first and second displays; and displaying, by the processor, the selected one of the first or second desktops or applications in a maximized condition.
2	The method of claim 1, wherein at least one of the first, second, and third inputs is achieved by at least a user input gesture.
3	The method of claim 1, wherein the third input is a user gesture comprising at least one of a tap or long hold gesture.
5	The method of claim 4, wherein the visual indicator has a wave shape.
4	The method of claim 1, wherein at least one of the first or second displays has a visual indicator displayed thereon and signifying that a desktop or application appearing on that display can be maximized by a user gesture.
6	The method of claim 1, wherein a fourth input is an instruction to minimize a selected one of the first or second desktops or

	applications, resulting in the selected one being displayed only one of the first and second displays.
7[P]	A non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method, the instructions comprising:
7[A]	instructions configured to receive a first predetermined input that represents an instruction to determine and reveal a first desktop or application on a first display of the multi-display device;
7[B]	instructions configured to receive a second predetermined input that represents an instruction to determine and reveal a second desktop or application on a second display of the multi-display device;
7[C]	instructions configured to respond to the first and second predetermined inputs with outputs that cause the first desktop or application to be displayed on the first display and cause the second desktop or application to be displayed on the second display:
7[D]	instructions configured to receive a third predetermined input that represents an instruction to maximize a selected one of the first or second desktops or applications resulting in the selected one being displayed on both of the first and second displays according to the instructions configured to respond to the third predetermined input; and instructions configured to respond to the third predetermined input that causes displaying of the selected one of the first or second desktops or applications in a maximized condition.
8	The computer-readable medium of claim 7, wherein at least one of the first or second displays has a visual indicator displayed thereon and signifying that a desktop or application appearing on that display can be maximized by a user gesture according to the instructions configured to receive a third predetermined input.

9	The computer-readable medium of claim 7 wherein a fourth predetermined input is an instruction to minimize a selected one of the first or second desktops or applications, resulting in the selected one being displayed only one of the first and second displays according to the instructions configured to respond to the third predetermined input.
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VI. LEVEL OF ORDINARY SKILL IN THE ART

42. For my analysis, I have been asked to assume that the date of the claimed invention is the filing date of the Provisional, but my opinions would be the same if the date of the claimed invention is determined to be the date of the Application. In my opinion, the field of art pertaining to the '756 patent includes information display using a handheld computing device. In my opinion, a person of ordinary skill in the art at the time of the alleged invention would have had an undergraduate degree in electrical engineering, computer engineering, computer science or a related field along with two years of experience in the field of user interface technologies, including e.g., graphical user interface technologies, or a related field. Additional education could offset a lesser amount of experience and vice versa.

43. In determining the characteristics of a POSITA, I considered several factors, including the type of problems encountered in the art, the solutions to those problems, the rapidity with which innovations are made in the field, the sophistication of the technology, and the education level of active workers in the field. I also placed

myself back in the time frame of the claimed invention and considered the students and colleagues with whom I had worked at that time.

44. I am qualified as a person having at least this level of skill. Based on my education, training, and professional experience, I am familiar with the level and abilities of a POSITA. Indeed, I have participated in professional organizations and have taught, trained, and worked closely with many such persons over the course of my career, including prior to and around the time of the claimed invention.

45. I provide my analysis and opinions in this declaration from the perspective of a POSITA, as I have defined it above, during the relevant time frame stated above, where appropriate.

VII. CLAIM CONSTRUCTION

46. The '756 patent, including the claims at issue, use the terms “screen” and “display” as nouns. A POSITA would have understood that these terms can be used in the art in different ways. For example, the Yook reference discussed below uses the term “functional view area” to refer to a portion of a physical screen that can output an image to a user, while the Aguilar reference discussed below uses the term “display segment” to refer to the same, and so on.

47. The '756 patent expressly defines both “screen” and “display” (when used as a noun. “The term ‘screen,’ ‘touch screen,’ or ‘touchscreen’ refers to a physical structure that includes one or more hardware components that provide the device with

the ability to render a user interface and/or receive user input.” Ex. 1001, 4:36-39. “The term ‘display’ refers to a portion of one or more screens used to display the output of a computer to a user.” Ex. 1001, 5:1-2. I have used these meanings of the terms “screen” and “display” in my analysis, and in my opinion, a POSITA would have used these same meanings in light of the clear definitions provided in the specification.

48. For all other claim terms, I have assumed the meaning as understood by a POSITA at the time of the claimed invention, where appropriate, in light of the patent’s specification, claims, and file history.

VIII. TECHNOLOGY BACKGROUND

49. I rely on, and incorporate, the understandings below regarding such known concepts and technologies, to support my opinions regarding the knowledge of a POSITA at the time of the invention, where appropriate, and the motivations relating to the application of the prior art. The concepts, technologies, processes, and understandings discussed in this section would have been in the mind of a POSITA when contemplating the disclosures and/or suggestions in the prior art and when considering combining features from that prior art.

50. When the Information Age began mid-20th century, portable handheld computers were a not-too-distant dream. As technology progressed, computing devices began to fluctuate in size as people became increasingly dependent on them and portability became a necessity. Devices began to race for smaller form factors that

could fit in a pocket, then once such a size was achievable, the race turned around and began for larger and more powerful devices, but still handheld and portable. By the first decade of the 21st century, cellular phones, “personal digital assistants,” and e-readers had rooted themselves into everyday life and become household items.

51. By October 2010, the earliest claimed priority date of the ’756 patent, handheld devices such as cell phones and personal digital assistants had long been known in the art and were in widespread use in society. Many of these devices, like those that are the subject of the ’756 patent, had the capability to divide a screen area into multiple displays. Various prior art references describe these types of devices with some or all of these characteristics, most notably Yook, Lee, Aguilar, and Purcell, which are the focus of my declaration and discussed at length below.

52. U.S. Patent Application Publication No. 2010/0248788 A1 to Yook is directed to a multi-display and multi-screen device that includes a touch screen user interface. Ex. 1004, Figs. 1-13, ¶¶[0006]-[0009]. In particular, Yook discloses a method of “supporting divided screen areas and a mobile terminal employing the same.” Ex. 1004, Abstract. Yook further discloses a split-screen management program that is stored on the device for the purpose of “activating the user functions according to generated input signals; dividing a screen into divided screen areas that correspond to activated user functions; and outputting functional view areas associated with the activated user functions to the corresponding divided screen areas.” *Id.* Yook provides

multiple examples of how a user of the device can interact with the device and stored program in order to display multiple applications at once. *See, e.g.*, Figs. 3-13. For example, Yook describes several examples of opening two applications on two separate displays and then switching between that view and one application displaying across both displays. *See, e.g., Id.*, ¶¶[0046]-[0047]. An example is Fig. 4b, where a touch input (e.g., a touch of a “Home Key”) can swap an application between minimized on one display or maximized on two displays. *Id.*, at ¶[0046], Fig. 4b.

53. U.S. Patent Application Publication No. 2007/0085759 A1 to Lee is directed to a multi-display and multi-screen device that includes a touch screen user interface. Ex. 1005, Figs. 1-13, ¶¶[0006]-[0009]. In particular, Lee discloses a method of “displaying multi-media data and providing multitasking features and a mobile communications terminal capable of implementing the same.” *Id.*, Abstract. Lee further discloses a split-screen management program that is stored on the device for the purpose of “activating the user functions according to generated input signals; dividing a screen into divided screen areas that correspond to activated user functions; and outputting functional view areas associated with the activated user functions to the corresponding divided screen areas.” *Id.* Lee provides an example of displaying one application, and then instructing a second application to open on a second display. *Id.*, ¶¶[0053]-[0054]. In Figs. 10C-10D, Lee discloses that when one application is initially displayed and an event occurs, such as an incoming text message, the event is revealed

on the second display. *Id.*, ¶¶[0053]-[0054]. In Fig. 11, Lee further discloses that one application may be maximized, resulting in the application being displayed on both of the first and second displays. *Id.*, ¶[0054], Figs. 11B-D.

54. U.S. Patent No. 8,677,284 A1 to Aguilar is directed to a multi-display device that is able to display a single application across the entire screen, or divide the screen into multiple displays for multiple applications. Ex. 1006, Abstract, Figs. 4-9. Aguilar describes its invention and disclosure as directed to overcoming advances in computer technologies that have placed limitations on the use and functionality of smaller touchscreen devices. *Id.*, 1:14-22. To overcome these limitations, Aguilar describes a touchscreen device that can be divided into multiple logical displays and display content from different applications at once, allowing a user to be able to multitask. *Id.*, 2:1-5, 26-41, 5:5-19, 6:48-7:63.

55. U.S. Patent Application Publication No. 2007/0024645 A1 to Purcell directed a system with multiple display monitors that is used to display multiple applications at the same time to a user. Ex. 1007, Abstract. Purcell notes that its multiple display system may be operated with the Windows operating system, which supported multiple application displays. *Id.*, ¶[0003]. Purcell notes that “to permit another application to execute concurrently and display an image window adjacent to an image window of the primary application, system 100 dynamically changes the primary application image window size to match that of a left monitor (monitor 115).”

Id., ¶[0016]. The system then “initiates execution of a secondary application that displays an associated image window on the right monitor (117).” *Id.* As part of the dynamic resizing described in Purcell, the primary application window changes size and is reduced to a portion of the amount of pixels it displays. *Id.*, ¶¶[0016], [0019].

IX. SUMMARY OF OPINIONS

56. Based on my knowledge and experience and the materials I have reviewed, I have formed the following opinions.

57. It is my opinion that claims 1-9 (the “Challenged Claims”) of the ’756 patent are unpatentable over the prior art.

X. GROUND 1: CLAIMS 1-4 AND 6-9 ARE ANTICIPATED BY YOOK

58. I have reviewed and am familiar with U.S. Patent Pub. App. No. 2010/0248788 A1 (“Yook”) filed on March 22, 2010, claiming priority to provisional application number 61/163,259 filed on March 25, 2009, and published on September, 30, 2010.

59. In my opinion, based on the following analysis, claims 1-9 of the ’756 patent are invalid as anticipated by Yook.

A. Claim 1

1. 1[P] A method of displaying a plurality of desktops and/or applications, each having at least one window, on a multi-display device, comprising:

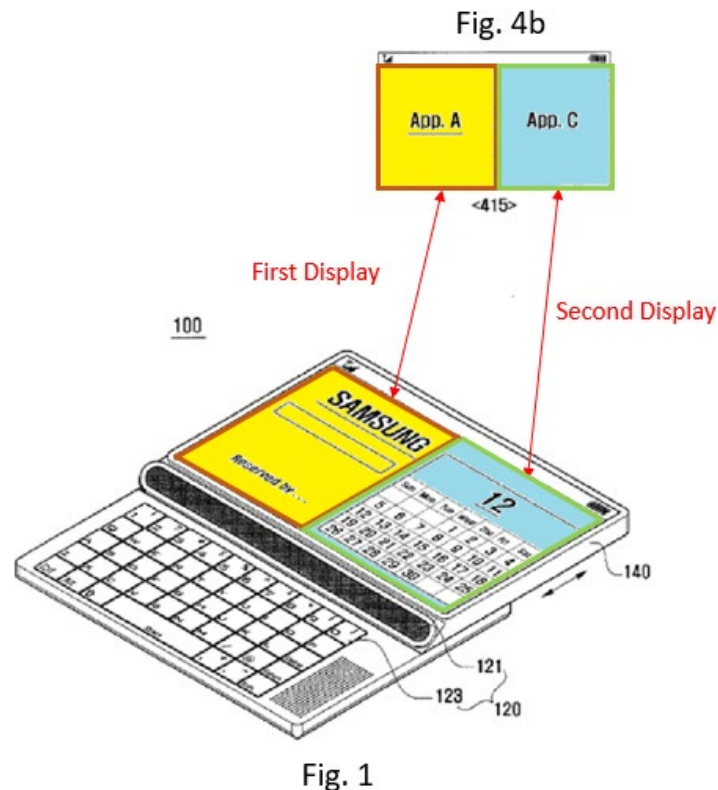
60. To the extent the preamble is a limitation, in my opinion, Yook discloses this limitation.

61. The '756 patent specification defines “display” at 5:1-9:

The term “display” refers to a portion of one or more screens used to display the output of a computer to a user. A display may be a single-screen display or a multi-screen display, referred to as a composite display. A composite display can encompass the touch sensitive display of one or more screens. A single physical screen can include multiple displays that are managed as separate logical displays. Thus, different content can be displayed on the separate displays although part of the same physical screen.

62. Yook squarely meets this definition and discloses both a first display and a second display. The figure annotated below was created to show how Yook describes its system and methods. It shows an exemplary mobile terminal having two displays (with a plurality of applications), each “a portion of one or more screens that is used to display an image to a user,” as shown by a calendar image on the first display (indicated by an orange box), and a desktop or browser application on the second display (indicated by a green box). In other words, Yook’s device has “[a] single physical screen,” which has been divided into “multiple displays that are managed as separate

logical displays,” and it has “different content [] displayed on the separate displays although part of the same physical screen.” Ex. 1001, 5:1-9.



Ex. 1004, Fig. 1, 4b (annotated).

63. As shown in the annotated figure above, Yook has at least two displays, shown in the green and orange boxes above, which are logical divisions of a single screen. For purposes of my analysis, and because the displays are logical areas that may move, I will denote a first display with an **orange** box and a second display with a **green** box. I note that this squarely meets the definition provided by the '756 patent above for displays.

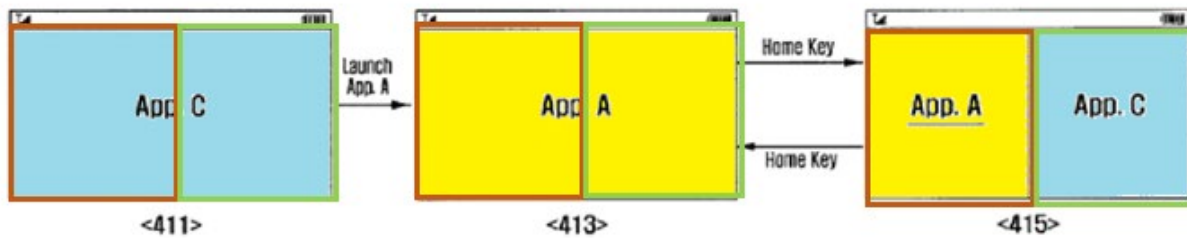
64. Yook also provides many examples of how a user can interact with the touchscreen displays to view a single application window across both displays, or divide an application window to display two windows for the same application across both displays, or divide the screen into two displays so that the user can view two different applications across the two displays. Ex. 1004, Figs. 3-13.

2. **1[A] receiving, by a processor, a first input that represents an instruction to reveal one of a desktop or application on a first display of the multi-display device; selecting, by the processor, a first desktop or application to display on the first display;**

65. In my opinion, Yook discloses this limitation.

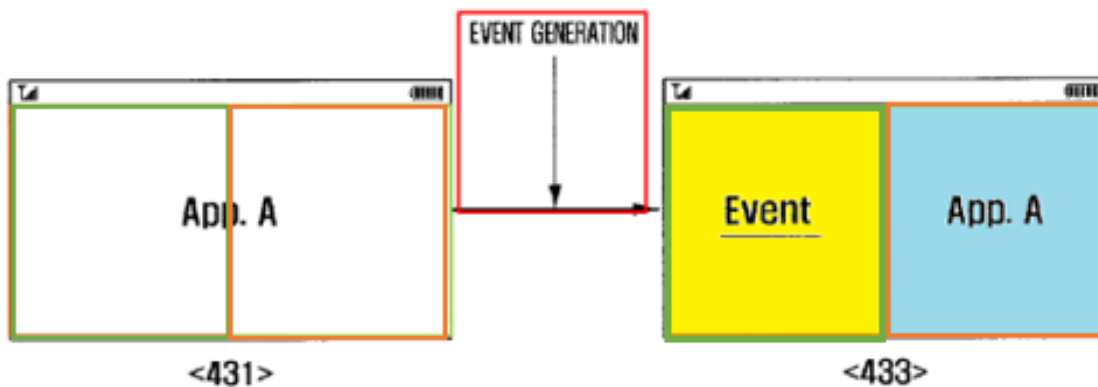
66. As shown in Fig. 4b (annotated below), Yook's device can operate in split-screen mode for two applications in which an application "A" (App.A) is displayed on the first display (indicated by an orange box). Ex. 1004, ¶[0046]. Further, Fig. 4b demonstrates that when a user launches an application (e.g., App.A or App.C), that application is displayed and revealed to the user on the first display. *Id.*, ¶[0046]-[0047]. Thus, a user can input an instruction to reveal, e.g., App.C., and the processor (see *supra* ¶69) in Yook's multi-display device will select App.C. to display on the first display, as shown in element 411. *Id.*, Fig. 4b.

FIG . 4b



67. As another example, App.A displays on the first display area (indicated by an orange box) in element 431 in Fig. 4d shown below, and the second application that is launched is displayed on the second display area (indicated by a green box). Ex. 1004, Fig. 4d, ¶[0051].

FIG . 4d

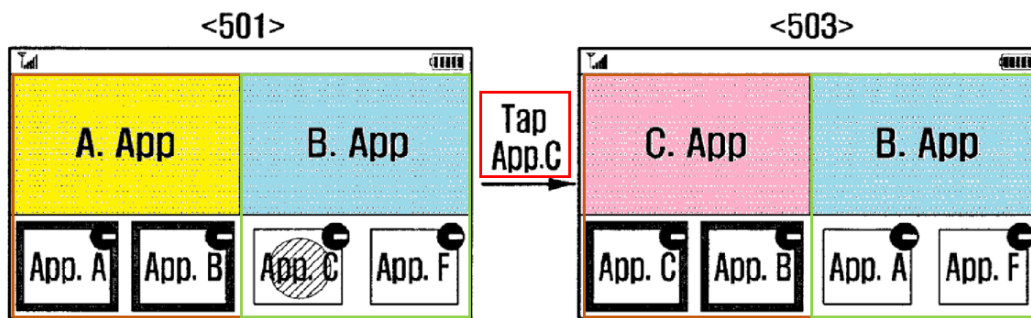


68. As shown in Fig. 5A (annotated below), a user can input a selection such as tapping an icon for Application “C.” Ex. 1004, ¶[0058]. Upon receiving the input, the processor (see *supra* ¶[69]) in Yook’s multi-display device reveals App.C. on a first

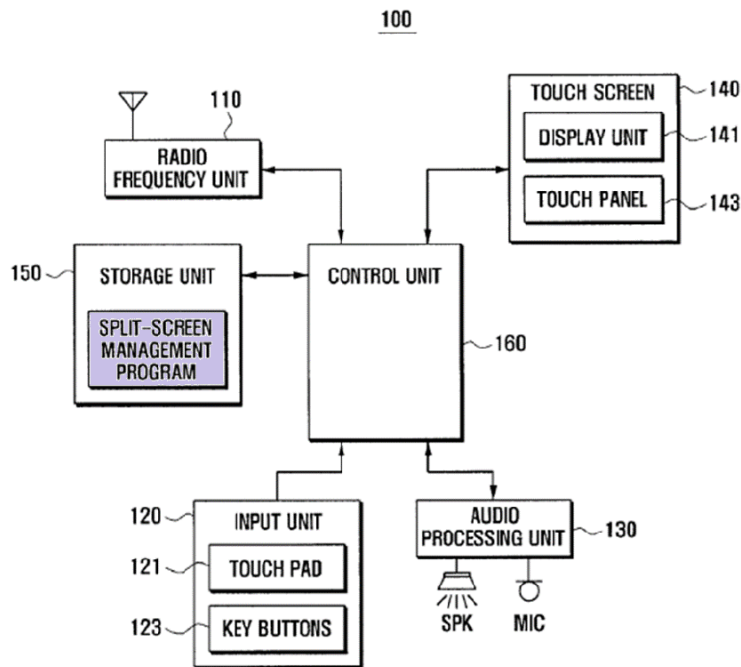
display (orange outline) where a previous application App.A was initially displayed.

Id., Fig. 5a, ¶[0058].

FIG . 5a



69. Fig. 2 (annotated below) also discloses a split-screen management program for Yook's device, such that the program manages the physical screen on Yook's device and can split it into multiple logical displays as requested by a user. Ex. 1004, ¶[0026]. The program then manages and controls the multiple logical displays of the screen as requested by a user. *Id.* The split-screen management program is executed in a series of instructions or commands by the Control Unit. *Id.*, Fig. 2.



3. **1[B] receiving, by the processor, a second input that represents an instruction to reveal one of a desktop or application on a second display of the multi-display device; selecting, by the processor, a second desktop or application to display on the second display;**

70. In my opinion, Yook discloses this limitation.

71. Fig. 4b (annotated below), demonstrates that a user can “generate an input signal corresponding to one of a particular key and a touch even like the ‘Home’ key in screen 413...to simultaneously output two functional view areas App.C and App.A.” Ex. 1004, ¶[0047]. In response to receiving the input from touching the ‘Home’ key (indicated by a bright red box), a second application, App.C is displayed on the second display (indicated by a green box). *Id.* Thus, the processor in Yook’s device can receive an input to reveal a second application on a second display (green),

and the processor will reveal the second application to the user when it may have been in the background prior to the reveal. *Id.*, 4b.

FIG . 4b



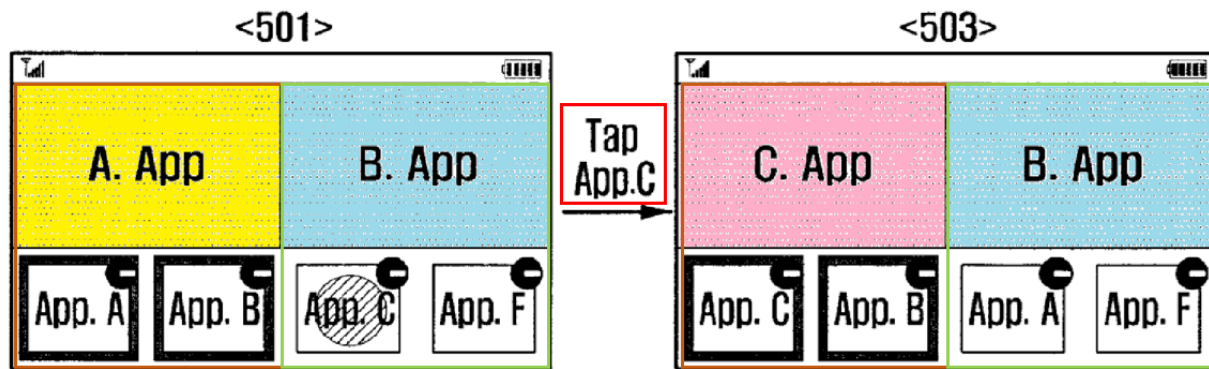
72. Fig. 10 (annotated below) exemplifies a scenario where a user can generate an input to reveal a first application (e.g., web browser) and then a second input to reveal a second application (e.g., Twitter). Ex. 1004, ¶[0096]-[0101]. In response to that second user input, Yook's device will then reveal a second application (e.g., Twitter) on the second display. *Id.*, Fig. 10.



73. Fig. 5a (annotated below) is yet another example disclosing that a user can select one out of multiple running applications to reveal on each display. Ex. 1004,

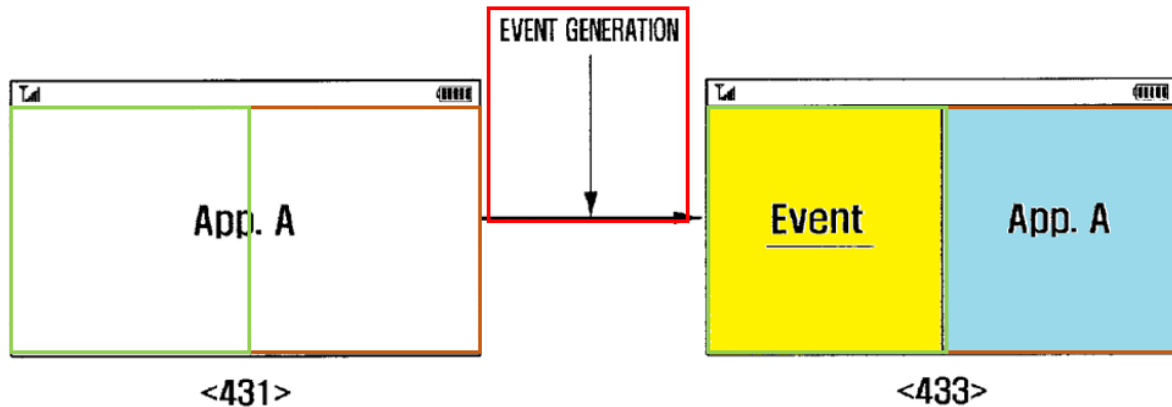
¶[0058]. For example, a user can select by the touchscreen one of App.A, App.B, App.C, or App.F from a stack of applications in order to display the selected application on the second display. *Id.*, Fig. 5a.

FIG . 5a



74. As another example, Fig. 4d below demonstrates how a second application “Event” can be displayed on the second display (green outline) upon the processor in Yook’s device receiving an “event generation” input. Ex. 1004, Fig. 4d, ¶[0051]..

FIG . 4d



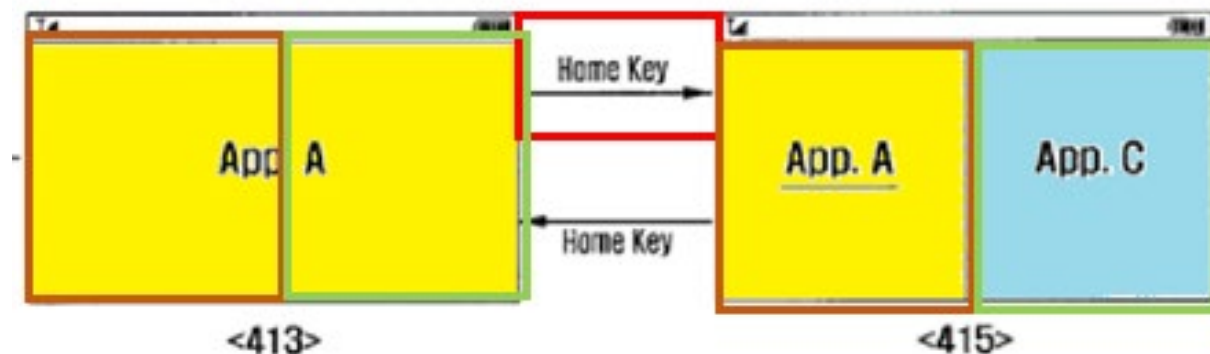
4. 1[C] receiving, by the processor, a third input that represents an instruction to maximize a selected one of the first or second desktops or applications resulting in the selected one being displayed on both of the first and second displays; and displaying, by the processor, the selected one of the first or second desktops or applications in a maximized condition.

75. In my opinion, Yook discloses this limitation.

76. As I explained previously, Fig. 4b demonstrates Yook's device toggling between full screen mode for one application, or split-screen mode for two applications. Ex. 1004, Fig. 4b, ¶[0046]. When one of the two applications is transitioned from split-screen mode to full screen mode, that application is maximized to be displayed on both displays, where the other application is no longer displayed. *Id.* A user can initiate this toggling by inputting an instruction to Yook's device, such as touching a "Home Key," whereby Yook's processor responds to the input by

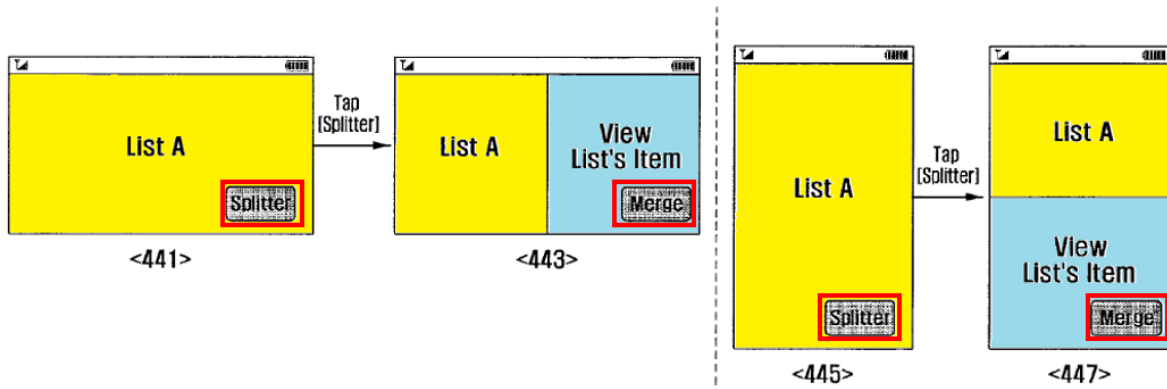
maximizing one of the first or second applications, resulting in the selected one being displayed on both of the first and second displays. *Id.*, Fig. 4b.

FIG . 4b



77. Yook shows in Fig. 4e how a user can switch between a full-screen display for an application and back to a split-screen display for an application, which also meets this claim. Ex. 1004, ¶[0055]. As annotated Fig. 4e shows below, an application (yellow) can be displayed on two displays in full screen mode. Upon touching the “Splitter” button, App.A is divided into two windows each displayed on its own display. Upon touching the “Merge” button, indicated with a red box, application “A” converges back into one window displayed on two displays in full screen mode. *Id.*, Fig. 4e, ¶[0055].

FIG . 4e



B. Claim 2 - The method of claim 1, wherein at least one of the first, second, and third inputs is achieved by at least a user input gesture.

78. In my opinion, Yook discloses this limitation.

79. For example, Yook discloses in Fig. 4b that a user may enter a touch event such as “tapping” the “Home” key input, which can be either the second or the third input that switches between split-screen mode and full screen mode for one of the displayed applications. Ex. 1004, Fig. 4b, ¶[0046].

FIG . 4b



C. Claim 3 - The method of claim 1, wherein the third input is a user gesture comprising at least one of a tap or long hold gesture.

80. In my opinion, Yook discloses this limitation.

81. As I previously explained, a user may enter a touch event such as touching the “Home” key input, causing the application to be maximized on both displays. The touch event for the Home Key indicates a tap on a touchscreen interface. Ex. 1004, ¶[0047].

The mobile terminal 100 can provide simultaneous presentation of two pieces of data related by an event history. *For example, when the user generates an input signal corresponding to one of a particular key and a touch event like the ‘Home’ key in screen 413, the mobile terminal 100 can simultaneously output two functional view areas App.C and App.A to the display unit 141* as illustrated in screen 415, where the functional view area App.C is related by an event history to the functional view area App.A. In this case, the mobile terminal 100 can control the display unit 141 to divide the screen into two areas, and cause functional view areas to be displayed on the corresponding areas. That is, the mobile terminal 100 can display the functional view area App.A (presented immediately before pressing the ‘Home’ key) on the left divided screen area, and display the functional view area App.C (presented in relation to the function ‘C’ before the function ‘A’) on the right divided screen area. The mobile terminal 100 can move a functional view area to another divided screen area in response to occurrence of, for example, a drag event. When the

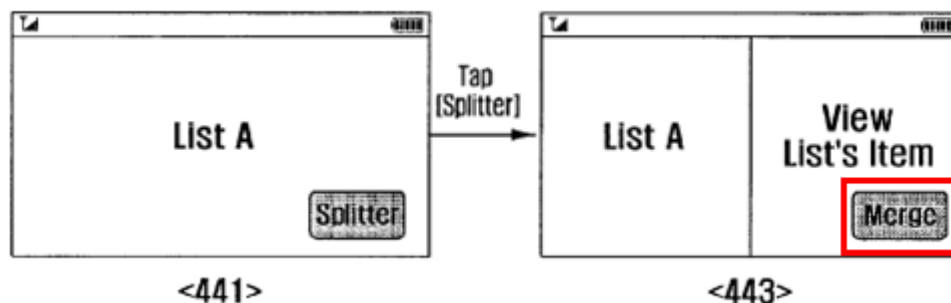
‘Home’ key is pressed again during display of divided screen areas, the mobile terminal 100 can return to the previous screen as illustrated in screen 413. As described above, when two functional view areas are related to each other through an event history, the mobile terminal 100 can simultaneously present the two functional view areas on the divided screen areas.

Ex. 1004, ¶[0047].

D. Claim 4 – The method of claim 1, wherein at least one of the first or second displays has a visual indicator displayed thereon and signifying that a desktop or application appearing on that display can be maximized by a user gesture.

82. In my opinion, Yook discloses this limitation.

83. For example, in Fig. 4e (annotated below), Yook displays a “merge” button (indicated by a red box) as a displayed visual indicator signifying that an application displayed in split-screen mode can be returned back to full screen mode with the one application displayed on both the first and second displays. Ex. 1004, Fig. 4e, ¶[0055].



Referring to FIG. 4E, the user of the mobile terminal 100 can generate an input signal for activating a listing function, the mobile terminal 100 can display a functional view area “List A” as to the listing function on the display unit 141 and further display a splitter icon for divided screen areas, as illustrated in screen 441. Thereafter, when the user touches the splitter icon, the mobile terminal 100 can output a functional view area (items of List A) related to detailed viewing as illustrated in screen 443. That is, the mobile terminal 100 can divide the screens, output a resized functional view area “List A” to the display unit 141, and output the functional view area related to detailed viewing to the display unit 141 together with the functional view area “List A”. Here, in the mobile terminal 100, divided screen areas can be formed in portrait mode as illustrated in screen 445 and screen 447.

The mobile terminal 100 can provide a “merge” icon for returning to the previous screen as illustrated in screen 445 or screen 447. When the user selects the “merge” icon, the mobile terminal 100 can return to screen 441 or screen 445.

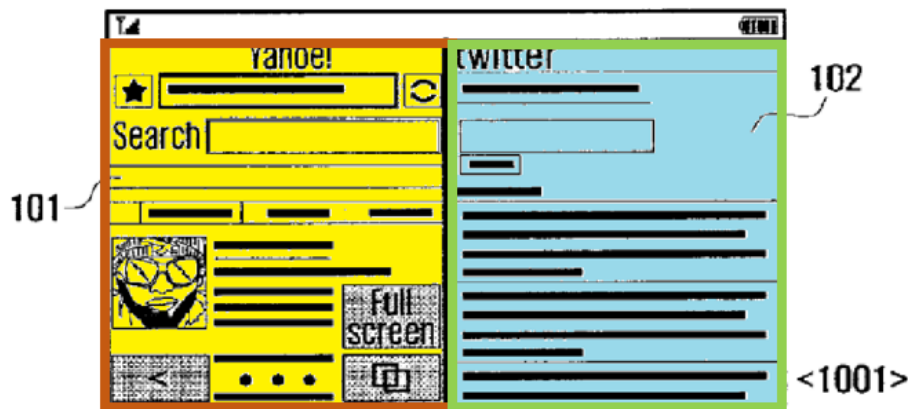
Ex. 1004, ¶¶[0055]-[0056].

84. Yook also notes that “[f]or an effective user interface, automatic transition between the divided screen areas and the full screen can also be supported according to one of the design and user settings.” Ex. 1004, ¶[0114].

In the above description, several exemplary forms of user interaction according to the present invention are illustrated and

described. However, the present invention is not limited to these. For an effective user interface, additional forms of user interaction including automatic transition between the divided screen areas and the full screen can also be supported according to one of the design and user settings.

85. In addition, Fig. 10 of Yook shows a “Full screen” button on a display. A POSITA would have understood that this button allows users to maximize an application while two applications are currently displayed.



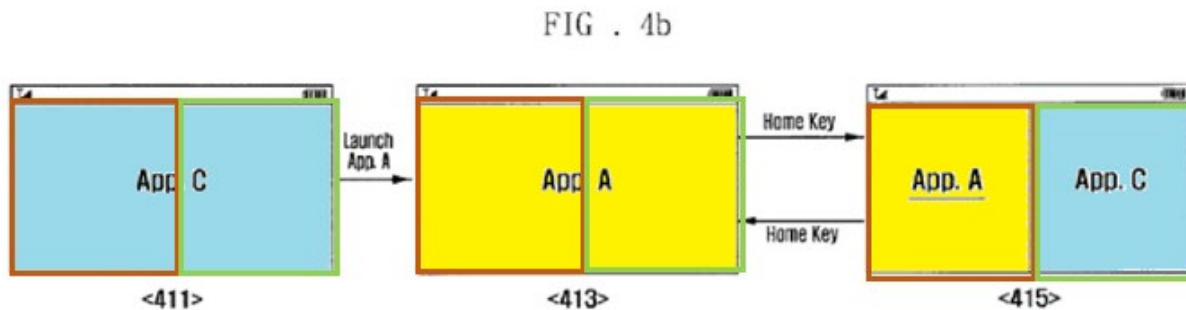
Id., Fig. 10.

- E. Claim 6 - The method of claim 1, wherein a fourth input is an instruction to minimize a selected one of the first or second desktops or applications, resulting in the selected one being displayed only one of the first and second displays.**

86. In my opinion, Yook discloses this limitation.

87. As I explained previously, Fig. 4b demonstrates that Yook’s device can switch between full screen mode for a single application and split-screen mode for

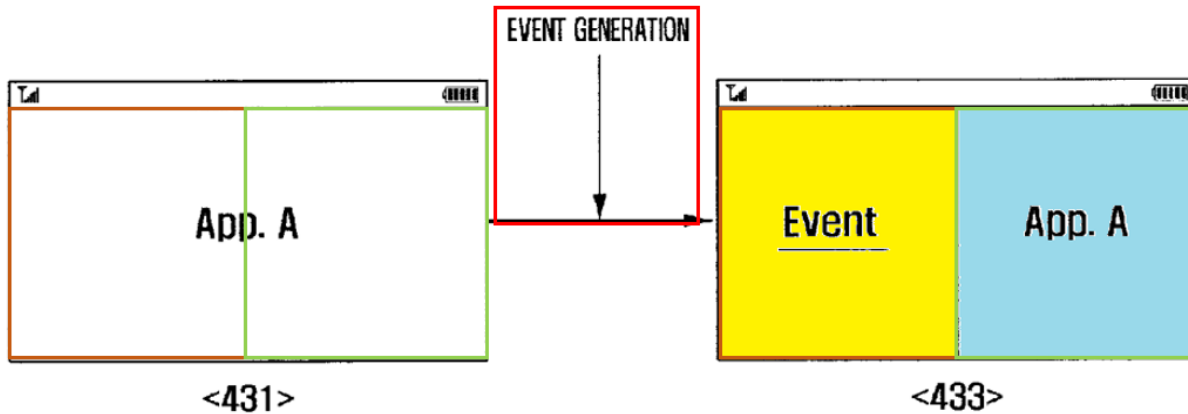
two applications. Ex. 1004, ¶[0046]. In these modes, an application window is displayed across one or both displays. *Id.*, Fig. 4b, ¶[0046].



88. Element 413 in Fig. 4b shows application “A” displayed on both the first and second displays of the screen. Ex. 1004, Fig. 4b, ¶[0046]-[0047]. By touching the “Home” key, a user can toggle back and forth between a split-screen mode and a full screen mode for application “A.” *Id.*, ¶[0047].

89. Yook discusses throughout its specification that when the split-screen mode is entered, the first window is “resized” to fit the new and smaller first display of the split screen display. For example, Yook describes with respect to Fig. 4d that “as illustrated in screen 433, the mobile terminal 100 can display the functional view area App.A as to the function ‘A’ on one divided screen area through resizing, and display a functional view area Event as to the event handling application program on the other divided screen area.” Ex. 1004, Fig. 4d, ¶[0051].

FIG . 4d



Referring to FIG. 4D, the user of the mobile terminal 100 can generate an input signal for activating a function 'A', the mobile terminal 100 can display a functional view area App.A as to the function 'A' on the display unit 141, as illustrated in screen 431. Thereafter, when an event corresponding to one of a schedule and a condition is generated, the mobile terminal 100 can activate an application program for handling the event and output a functional view area as to the event handling application program to the display unit 141. Here, as illustrated in screen 433, the mobile terminal 100 can display the functional view area App.A as to the function 'A' on one divided screen area through resizing, and display a functional view area Event as to the event handling application program on the other divided screen area.

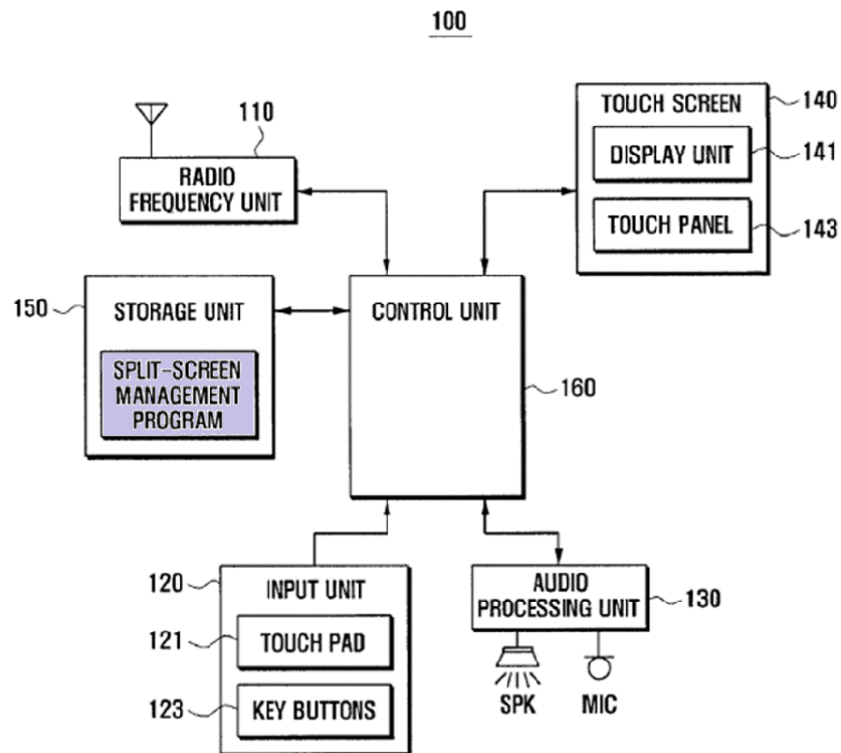
Ex. 1004, ¶[0051].

F. Claim 7

- 1. 7[P] A non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method, the instructions comprising:**

90. In my opinion, Yook discloses this limitation.

91. Yook discloses in Fig. 2 (annotated below) a split-screen management program that is stored on the device for the purpose of controlling the two or more logical displays of the screen to divide the screen into the logical displays if requested by a user. Ex. 1004, ¶[0026]. Yook also discloses that “ROM ... may store ... software or computer code that when accessed and executed by the ... processor ... implement the processing methods described herein.” *Id.*, Fig. 2, ¶[0117]. ROM stands for “Read-only Memory” and it is a non-transitory computer readable medium (software or computer code) that comprises computer executable instructions.



2. **7[A] instructions configured to receive a first predetermined input that represents an instruction to determine and reveal a first desktop or application on a first display of the multi-display device;**

92. In my opinion, Yook discloses this limitation for at least the reasons I discuss for claim 1[A].

3. **7[B] instructions configured to receive a second predetermined input that represents an instruction to determine and reveal a second desktop or application on a second display of the multi-display device;**

93. In my opinion, Yook discloses this limitation for at least the reasons I discuss for claim 1[B].

4. **7[C] instructions configured to respond to the first and second predetermined inputs with outputs that cause the first desktop or application to be displayed on the first display and cause the second desktop or application to be displayed on the second display:**

94. In my opinion, Yook discloses this limitation for at least the reasons I discuss for claims 1[A] and 1[B].

5. **7[D] instructions configured to receive a third predetermined input that represents an instruction to maximize a selected one of the first or second desktops or applications resulting in the selected one being displayed on both of the first and second displays according to the instructions configured to respond to the third predetermined input; and instructions configured to respond to the third predetermined input that causes displaying of the selected one of the first or second desktops or applications in a maximized condition.**

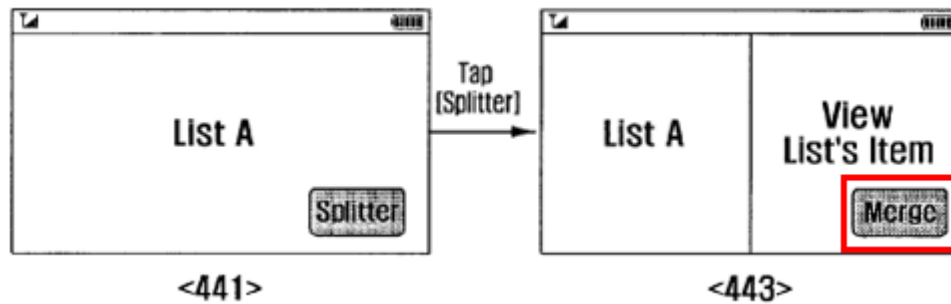
95. In my opinion, Yook discloses this limitation for at least the reasons I discuss for claim 1[C].

- G. **Claim 8 - The computer-readable medium of claim 7, wherein at least one of the first or second displays has a visual indicator displayed thereon and signifying that a desktop or application appearing on that display can be maximized by a user gesture according to the instructions configured to receive a third predetermined input.**

96. In my opinion, Yook discloses this limitation.

97. For example, in Fig. 4e, Yook displays a “merge” button as a visual indicator that a user can tap, returning the split-screen display back into full screen

mode as one application displayed on both the first and second displays. Ex. 1004, Fig. 4e, ¶[0055].



Referring to FIG. 4E, the user of the mobile terminal 100 can generate an input signal for activating a listing function, the mobile terminal 100 can display a functional view area “List A” as to the listing function on the display unit 141 and further display a splitter icon for divided screen areas, as illustrated in screen 441. Thereafter, when the user touches the splitter icon, the mobile terminal 100 can output a functional view area (items of List A) related to detailed viewing as illustrated in screen 443. That is, the mobile terminal 100 can divide the screens, output a resized functional view area “List A” to the display unit 141, and output the functional view area related to detailed viewing to the display unit 141 together with the functional view area “List A”. Here, in the mobile terminal 100, divided screen areas can be formed in portrait mode as illustrated in screen 445 and screen 447.

Ex. 1004, ¶[0055].

98. Yook also notes that "[f]or an effective user interface, automatic transition between the divided screen areas and the full screen can also be supported according to one of the design and user settings." Ex. 1004, ¶[0114].

In the above description, several exemplary forms of user interaction according to the present invention are illustrated and described. However, the present invention is not limited to these. For an effective user interface, additional forms of user interaction including automatic transition between the divided screen areas and the full screen can also be supported according to one of the design and user settings.

Ex. 1004, ¶[0114].

H. Claim 9 - The computer-readable medium of claim 7 wherein a fourth predetermined input is an instruction to minimize a selected one of the first or second desktops or applications, resulting in the selected one being displayed only one of the first and second displays according to the instructions configured to respond to the third predetermined input.

99. In my opinion, Yook discloses this limitation for at least the reasons I discuss for claim 6.

XI. GROUND 2: ALL CHALLENGED CLAIMS ARE OBVIOUS OVER YOOK

100. It is my opinion that if the Board finds that Yook does not anticipate the Challenged Claims, then such Challenged Claims (including claim 5) are rendered obvious by Yook.

Certain phrases used throughout Yook may differ from the terminology used in the '756 patent. My opinions take into account these differences. For example, Yook may refer to a “functional view area” or a “divided screen area,” but I understand these phrases as meeting the definition that the '756 patent gives to a “display.” Ex. 1001, 5:1-2. *See, e.g.:*

The term “display” refers to a portion of one or more screens used to display the output of a computer to a user.

Ex. 1001, 5:1-2.

A method of supporting divided screen areas and a mobile terminal employing the same are disclosed. The method includes: generating input signals for one of sequentially and simultaneously activating a plurality of user functions; activating the user functions according to generated input signals; ***dividing a screen into divided screen areas that correspond to activated user functions; and outputting functional view areas associated with the activated user functions to the corresponding divided screen areas.***

Ex. 1004, Abstract

When two instances of a user function are activated, the control unit 160 can control the display unit 141 to divide the screen into two areas, and cause ***two functional view areas*** to be displayed on the corresponding areas as illustrated in screen 302. For example, when a first user function being a message composition function is

activated, the control unit 160 can control the display unit 141 to display one of a message composition view area in a full screen format and to display a message composition view area and a key map in a full screen format. Thereafter, when the user activates a second user function being the message composition function, the control unit 160 controls the display unit 141 ***to divide the screen into two areas, to display a functional view area A1.App*** (i.e., resized message composition view area) for the first user function on one area, and to display a functional view area A2.App for the second user function on the other area. For another example, when the user activates an application requiring two Web connections, ***the control unit 160 can control the display unit 141 to display a functional view area A1.App as to one Web connection and a functional view area A2.App as to the other Web connection on the corresponding areas.***

Id., ¶[0039].

101. Indeed, a “functional view area” or a generic “divided screen area” is simply a logical display, or “a portion of one or more screens used to display the output of a computer to a user.”

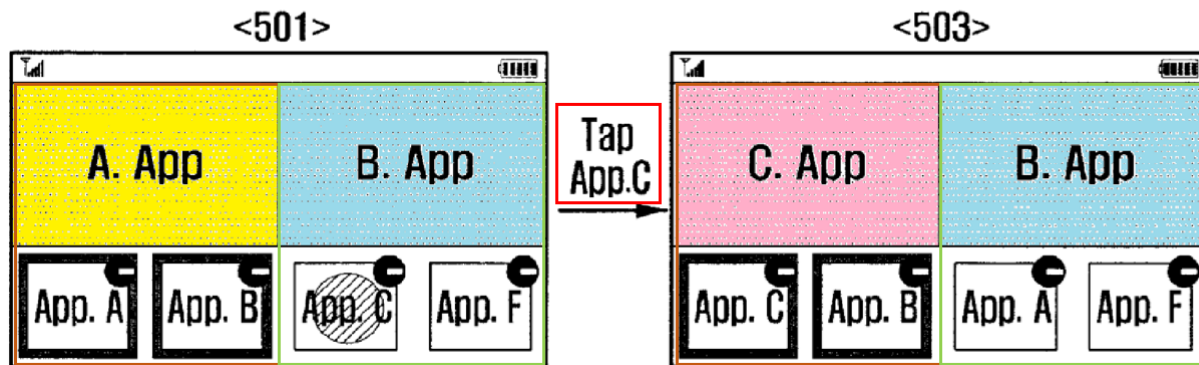
102. Similarly, I find no meaningful distinction between Yook’s reference to a “user function,” or what the ’756 patent refers to as an application. As they are used in their respective specifications, a POSITA would have understood their meanings to

be substantively indistinguishable. The same is true for other terminology differences between Yook and the '756 patent.

103. Yook discloses a device and provides numerous examples of how its split-screen management program can be interacted with and manipulated to affect the screen and display output on Yook's exemplary device. A POSITA would have understood that the examples Yook provided are all associated, so that one could achieve various results by implementing the many functionalities Yook describes. Thus, a POSITA would have been motivated to try each and every one of Yook's disclosed examples, in various sequences and in relation to each other. Indeed, Yook itself discloses some of these results.

104. For example, in Fig. 5a (annotated below) and in ¶[0059], Yook discloses that, where two displays are occupied by two separate application windows, a user may select a third application to replace an existing window on one or both of the displays. In order to reach the initial stage where two displays are occupied by two separate application windows, a user can first utilize the method disclosed in Fig. 4 to open A.App and B.App simultaneously. Ex. 1004, Fig. 5a, ¶[0059].

FIG . 5a



Alternatively, as described before in connection with FIG. 4, in response to activation of a user function, the mobile terminal 100 can output a functional view area related to the user function on the divided screen areas. The mobile terminal 100 can divide the screen of the display unit 141 into two divided screen areas, and output two functional view areas A.App and B.App related to the selected files on the divided screen areas.

Ex. 1004, ¶[0059].

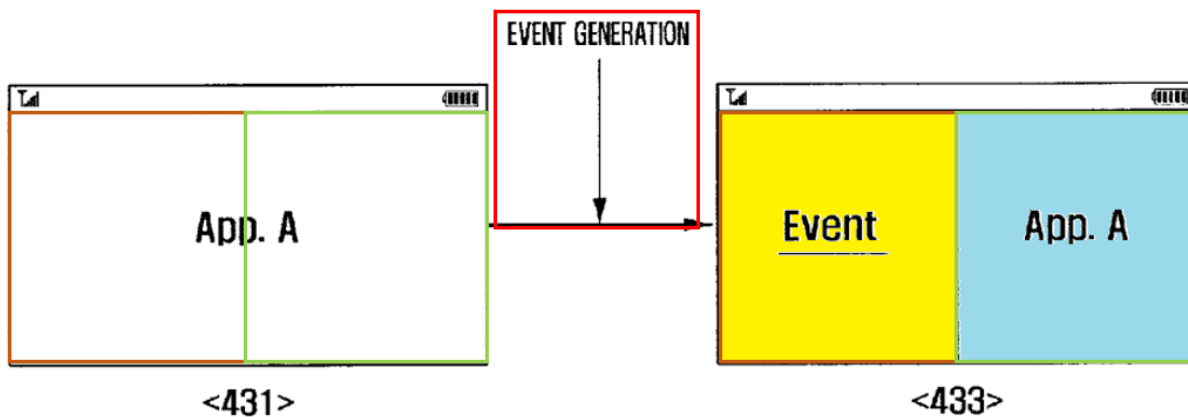
105. A POSITA would therefore have understood that Yook's disclosed examples are all associated and can be utilized to achieve various results. For example, a POSITA would have understood that the process demonstrated by Fig. 5a could be applied after undergoing the process demonstrated in Fig. 4d. By implementing these functionalities, a user can start with an open application "Event" (instead of application "B") and open application "A" on separate displays as demonstrated by Fig. 4d. Then,

the user could select application “C” to replace either of these applications, as demonstrated in Fig. 5a.

In screen 501, when the user generates an input signal for selecting an icon App.C, the mobile terminal 100 can output a functional view area C.App related to the icon App.C to the display unit 141 as illustrated in screen 503. During this process, the mobile terminal 100 can replace the functional view area A.App with the functional view area C.App. To output a new functional view area, the mobile terminal 100 can identify the oldest functional view area on display and replace the oldest functional view area with the new functional view area.

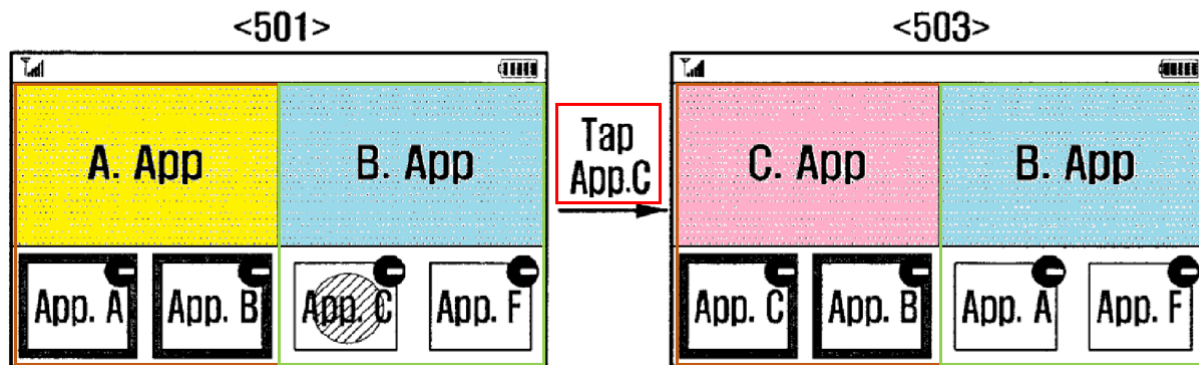
Ex. 1004, ¶[0060].

FIG . 4d



Ex. 1004, Fig 4d.

FIG . 5a



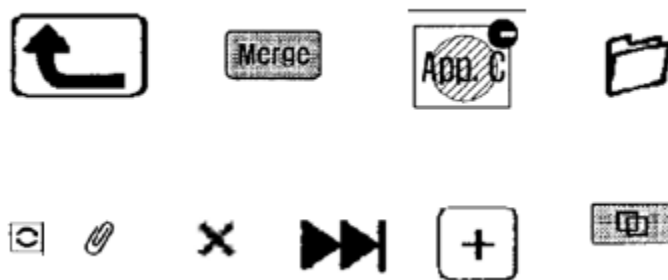
Ex. 1004, Fig 5a.

106. With respect to dependent claims 4 and 8, it is my opinion that, to the extent the Board finds that Yook does not anticipate those claims, then Yook renders those claims obvious.

107. Claims 4 and 8 are both directed to a displayed visual indicator signifying that an application can be maximized. As I explained in Section X, Yook discloses such a visual indicator. To the extent Patent Owner argues that Yook does not meet this claim element, then in my opinion, a POSITA would have found it routine and obvious to display the “merge” button on either display, signifying a user’s ability to maximize either application on either display. Indeed, Yook teaches in other examples that either application window can be maximized. *See, e.g.*, Figs. 4 and 5. Yook further discloses that “an effective user interface” would implement “additional forms of user interaction including automatic transition between the divided screen areas and the full

screen.” Ex. 1004, ¶[0114]. Yook therefore teaches giving users the ability to transition a split-screen application back into full screen mode. Further, a POSITA would have understood that this ability would undoubtedly be implemented in the form of a visual indicator, which, from the 2000s to today, is the industry’s universal method of alerting a user to an accessible function. In other words, a POSITA would have understood that Yook teaches that neglecting to give users the option to transition a split-screen application back to full screen, or in other words, forcing an application to remain in a minimized mode once they entered split-screen mode, would not be an effective user interface.

108. For claim 5, Yook discloses many different types of “icons” that are used to receive user gesture inputs. *See, e.g.*, Figs. 1, 4e, 5a, 5c, 5d, 6, 7a, 7b, 7c, 8, 9, 10, 11, 12, 13. Examples of these icons are displayed below:



109. A POSITA would have understood that Yook’s icons can have a wave shape because the shape taken by a visual indicator, or icon, is merely a matter of

common and routine design choice. Indeed, the shape of an icon does not affect its function or how a gesture input is received.

XII. GROUND 3: CLAIMS 1-3, 6, 7, AND 9 ARE ANTICIPATED BY LEE

110. I have reviewed and am familiar with U.S. Patent Pub. App. No. 2007/0085759 A1 (“Lee”) filed on October 12, 2006, claiming priority to Korean provisional application number 97136/2005 filed on September 15, 2005, and published on April 19, 2007.

111. In my opinion, based on the following analysis, claims 1-3, 6, 7, and 9 of the ’756 patent are invalid as anticipated by Lee.

112. [Reserved]

A. Claim 1

1. [1P] A method of displaying a plurality of desktops and/or applications, each having at least one window, on a multi-display device, comprising:

113. To the extent the preamble is a limitation, in my opinion, Lee discloses this limitation.

114. Lee discloses an exemplary mobile device that has two touch screens. *See, e.g.*, Ex. 1005, Figs. 4, 6. Each touch screen can display content. *Id.* For example, Figs. 4 and 6 show two examples of the display of two different applications (a plurality of applications) on both displays (Fig. 4) and one application spread across both displays (Fig. 6). As is clear by a simple inspection of the figures, these applications

each have at least one window. Lee's device therefore has a first display (indicated by an orange box) and a second display (indicated by a green box) and is a multi-display device capable of displaying a plurality of applications. Ex. 1005, Figs. 4, 6, ¶¶[0014]-[0017].

FIG. 4

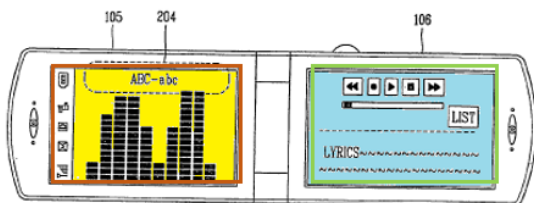
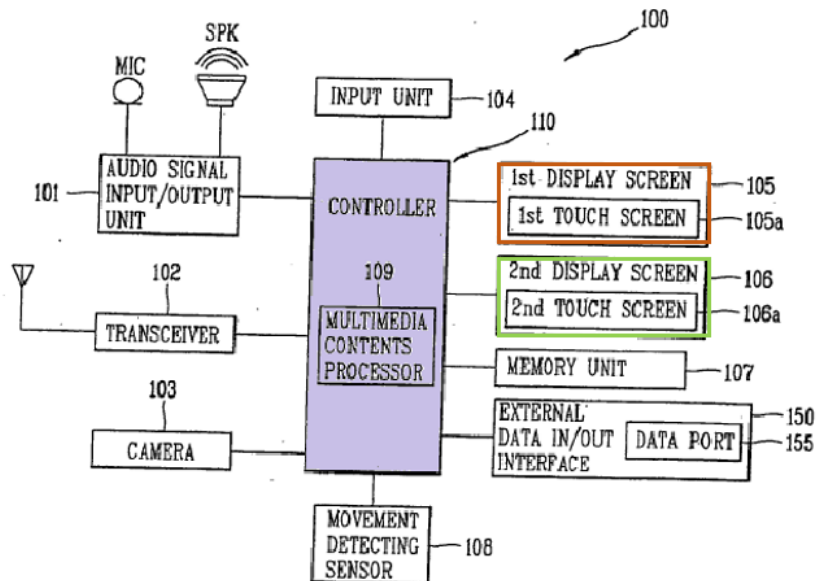


FIG. 6



115. Fig. 1 is an explanatory diagram of Lee's device. It describes Lee's device as containing a Controller with a Multimedia Contents Processor (annotated in purple below) that manages and controls a 1st display screen (indicated by a green box) and a 2nd display screen (indicated by an orange box). Ex. 1005, ¶¶[0027], [0029-32]. Fig. 1 further shows that Lee's device has a memory unit (element 107). *Id.*, Fig. 1.

FIG. 1

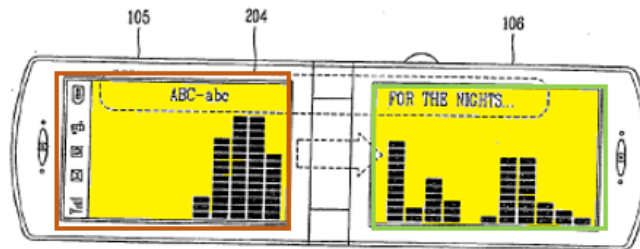


2. **1[A] receiving, by a processor, a first input that represents an instruction to reveal one of a desktop or application on a first display of the multi-display device; selecting, by the processor, a first desktop or application to display on the first display;**

116. In my opinion, Lee discloses this limitation.

117. As shown in Fig. 6, Yook's device, in response to user input, outputs a multimedia window across both the first display and the second display when a user provides an input for a selected multimedia file, which reveals the multimedia application on the first display. Ex. 1005, Fig. 6, ¶¶[0042],[0048].

FIG. 6

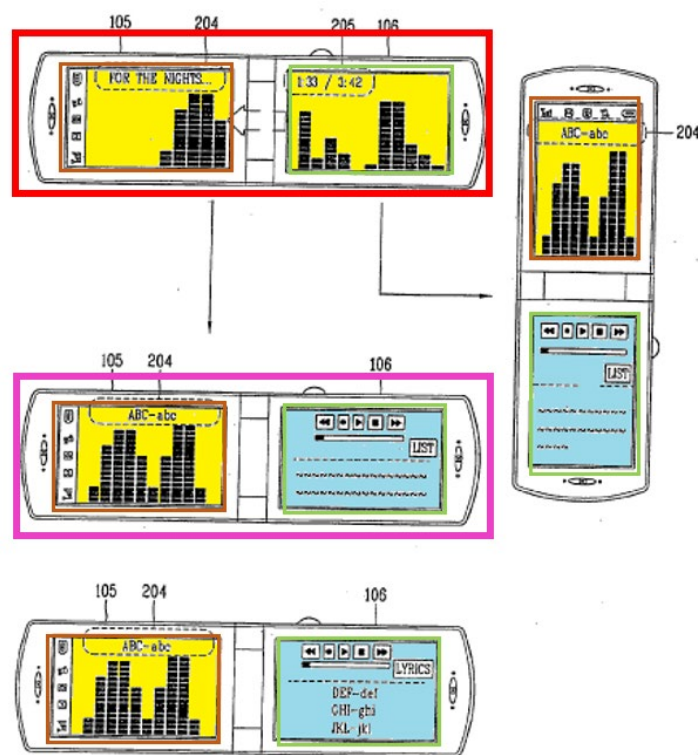


FIGS. 6 through 8 show exemplary views of the mobile terminal displaying that a main image of the first display screen expands to the second display screen in accordance with an embodiment of the present invention. The main image of the first display screen 105 expanding to the second display screen 106 can comprise a zoom-in (or zoom-out) image of the original main image of the first display screen 105 to display any detail missing from the original main image as shown in FIG. 6 because the first display screen 105 may only display a portion of the original image. In addition, the auxiliary or related information 204 displayed on the first display screen 105 can be displayed on the second screen 106 in a bigger font size and the second screen 106 can display more detailed information than the initial auxiliary information 204 or different information. For example, the second screen 106 can display different information (e.g., play time) regarding the music file when the first screen 105 displays the same information (e.g., artist name and song title).

Ex. 1005, ¶[0048].

118. As described in ¶[0048] above, Fig. 6 demonstrates when “a main image of the first display screen expands to the second display screen....” In that same paragraph, Lee notes that one reason this is done in its device is because when an application is relegated to a single display, it may only display a “portion or the original image.” Lee further describes that the first application may be shown only on the first display, which would also meet this claim element. *See, e.g.*, Ex. 1005, Fig. 9 (below).

FIG. 9

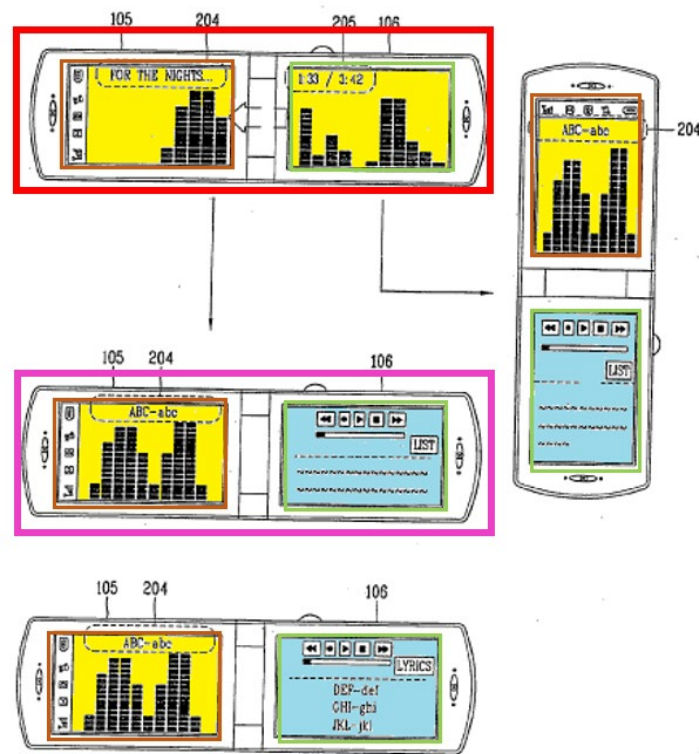


3. **1[B] receiving, by the processor, a second input that represents an instruction to reveal one of a desktop or application on a second display of the multi-display device; selecting, by the processor, a second desktop or application to display on the second display;**

119. In my opinion, Lee discloses this limitation.

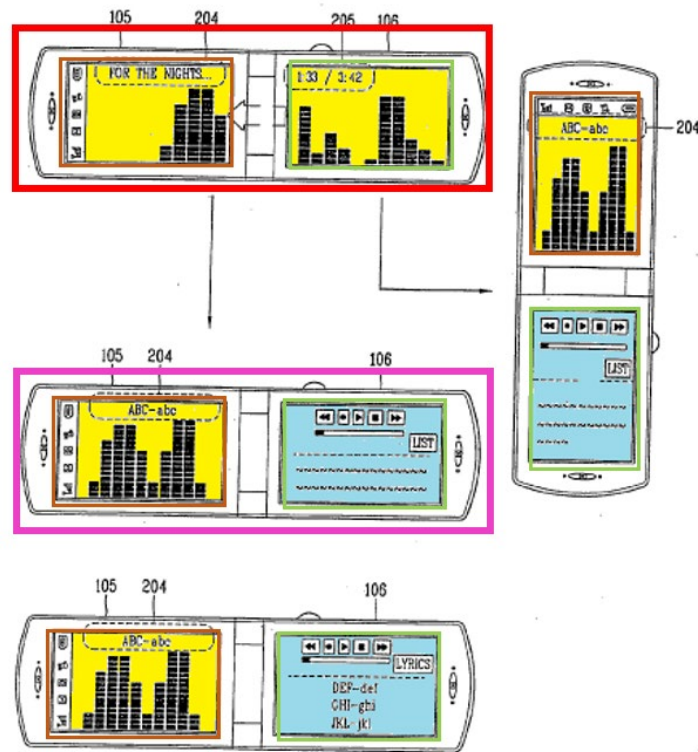
120. As I previously explained, Lee describes how a single application window can be displayed on both displays. Ex. 1005, Fig. 4, Fig. 6, Fig. 9, ¶[0048]. Lee further recognized that a user may wish to “multitask” among several applications, and Lee describes how a user can perform multitasking and display two application windows using the two separate displays. *Id.*, ¶¶[0049]-[0053]. For example, Fig. 9 (annotated below) shows the device displaying a window of the first application on both the first and second display (indicated by a bright red box). *Id.*, Fig. 9.

FIG. 9



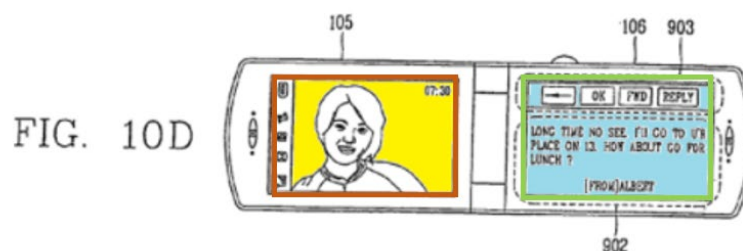
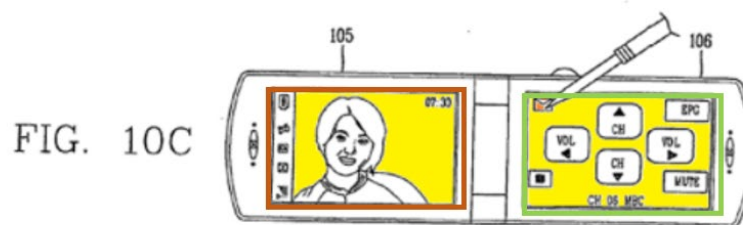
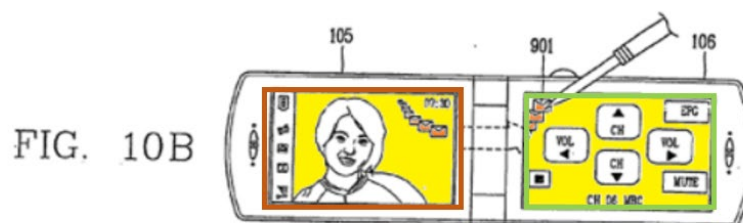
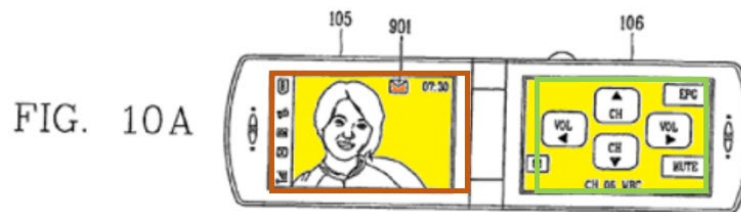
121. Once the device receives an input (e.g., screen rotation, touch screen button, or dedicated button), then the device adjusts the output of the second display (element 106, indicated by green boxes) so that the application previously displayed on both the first and “the screen information display on the second display screen disappears” (indicated by the pink box below). Ex. 1005, ¶[0049]. For example, in Fig. 9, the second display changed to reveal a control menu application, while the first display did not change and continued to output a display of the first application. *Id.*, Fig. 9.

FIG. 9



122. As another example, Fig. 10 demonstrates Lee's device receiving an input to reveal a second application and displaying the second application on the second display (indicated by a green box). Ex. 1005, Fig. 10, ¶¶[0052]-[0053]. Lee explains that an icon (indicated with a red box) is displayed “on a portion of one of the first and second display screens 105, 106 and can be moved to the other area of the same display screen or the other display screen.” *Id.*, ¶[0052]. In other words, a user can move the icon to the second display. A user can then input a “touch” or “click” on the icon on the second display, so that “the second display screen 106 displays the a [sic] content 902” of the second application (e.g., a text message). *Id.*, ¶[0053]. In other

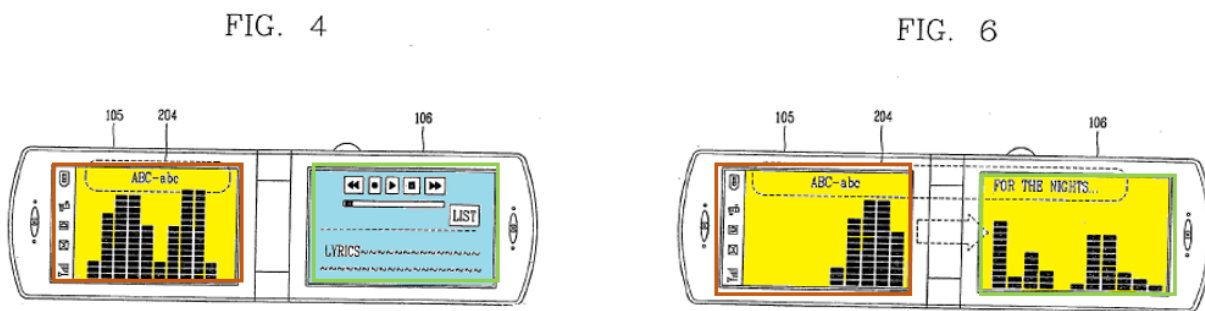
words, Lee discloses that a user can input an instruction to reveal an application on the second display, and the processor will comply. *Id.*, Figs. 10A-10D.



4. **1[C] receiving, by the processor, a third input that represents an instruction to maximize a selected one of the first or second desktops or applications resulting in the selected one being displayed on both of the first and second displays; and displaying, by the processor, the selected one of the first or second desktops or applications in a maximized condition.**

123. In my opinion, Lee discloses this limitation.

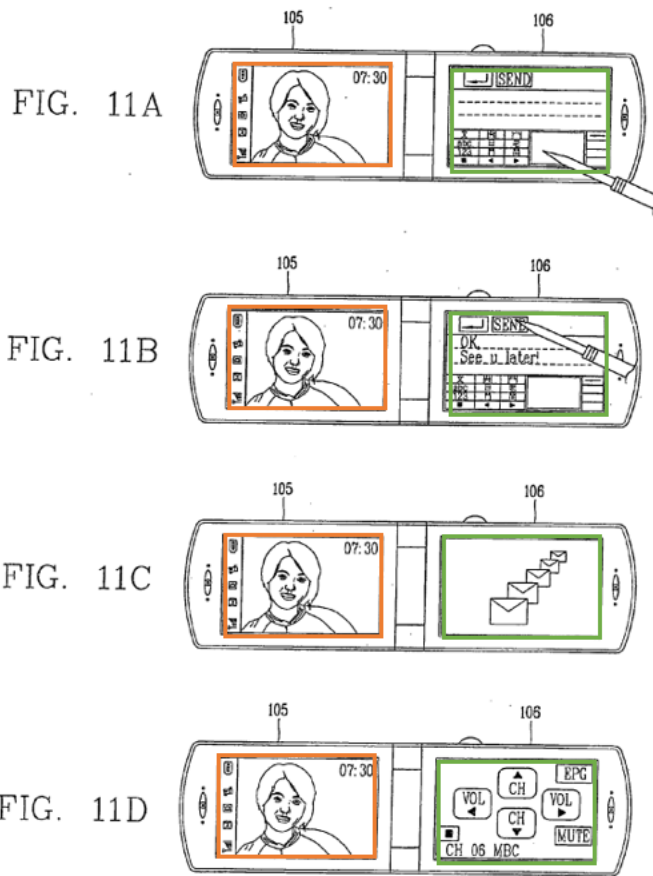
124. For example, as I explained earlier, Lee describes how “the mobile terminal displaying that a main image of the first display screen expands to the second display screen...” Ex. 1005, Fig. 4, Fig. 6, Fig. 9, ¶[0048]. When the device originally displays a main application on the first display and there is a second application on the second display (e.g., as shown in Fig. 4), then Lee’s device can expand the first application from the first display to the second display (as shown in Fig. 6). Ex. 1005, ¶[0048]. When this transition occurs, one of the two applications is maximized to be displayed on both displays. *Id.*, Fig. 4, 6.



125. As another example, Fig. 11 below demonstrates Lee’s device receiving an input to maximize a first application, resulting in the first application being displayed on both the first display (indicated by an orange box) and the second display (indicated by a green box). Ex. 1005, Fig. 11, ¶¶[0054]. Lee explains that after a user opens a second application on the second display as described in Fig. 10 (and as I explained in Section XII.A.3.), the user may generate an input such that “the second display screen 106 can return to display the default screen information (e.g., the

multimedia playback control menu screen as described above) as shown in Fig. 11D.”

Id. In Fig. 11, the user’s input may be touching a “back” or “send” button. In other words, Lee discloses that a user can input an instruction to maximize one of two applications concurrently displayed on Lee’s device. *Id.*, Figs. 11A-D.



B. Claim 2 - The method of claim 1, wherein at least one of the first, second, and third inputs is achieved by at least a user input gesture.

126. In my opinion, Lee discloses this limitation.

127. For example, Lee describes how its two displays can comprise a “touch sensitive screen” that is used to perform “input unit function.” Ex. 1005, ¶[0034].

In particular, Lee describes how “[w]hen the input unit 104 is implemented as a touch sensitive input unit (i.e., part of the touch sensitive screen), the controller 110 can receive signals inputted by the touch sensitive input unit 104 and expand the screen information displayed on the first display screen 105 to the second display screen 106....or return to the default...if both display screen have been displaying the same.” *Id.*, ¶[0037].

Also, the mobile terminal 100 can comprise the first display screen 105 to display general mobile terminal operations, multimedia contents, and information regarding those operations and the contents, and the second display screen 106 to perform input unit function (i.e., touch sensitive screen) and display various information and data. The first display screen 105 and the second display screen 106 can exchange each other's role (i.e., the first display screen 105 including the input unit function) and other various configurations of the display screens can be implemented and are within the scope of the present invention.

Ex. 1005, ¶[0034].

In accordance with one embodiment of the present invention, the mobile terminal 100 can include the input unit 104 being an independent feature arranged on the body of the terminal or being implemented in the same hardware configuration of the touch sensitive screen of at least one of the display screens 105, 106. When the input unit 104 is implemented as a touch sensitive input

unit (i.e., part of the touch sensitive screen), the controller 110 can receive signals inputted by the touch sensitive input unit 104 and expand the screen information displayed on the first display screen 105 to the second display screen 106 (i.e., the second display screen 106 displaying the same screen information of the first display screen 105 simultaneously), or return to the default display by displaying the screen information on only one display screen if the both display screens have been displaying the same. The order of expansion or returning to the default display is not limited to the above-described manner, but any displaying order or process can be within the scope of the present invention.

Ex. 1005, ¶[0037].

C. Claim 3 - The method of claim 1, wherein the third input is a user gesture comprising at least one of a tap or long hold gesture

128. In my opinion, Lee discloses this limitation.

129. As I explained in Section XII.B. above, Lee discloses a “touch sensitive screen” that receives input via user “taps” on the touchscreen. Ex. 1005, ¶[0034].

Lee goes on to show even more examples of such taps in Figs. 3A, 3B, 8, and 11.

FIG. 3A

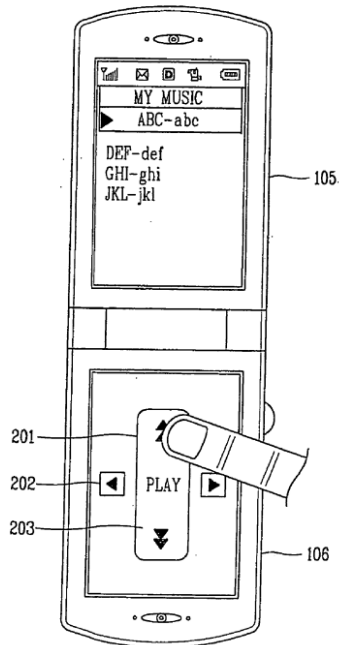


FIG. 3B

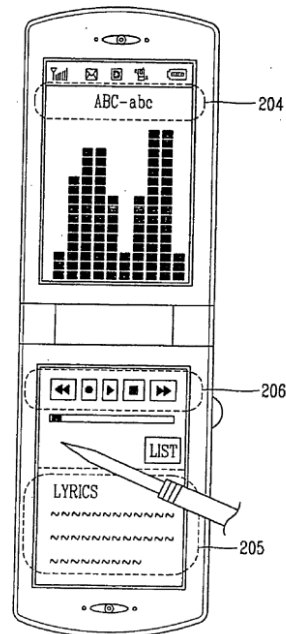


FIG. 8

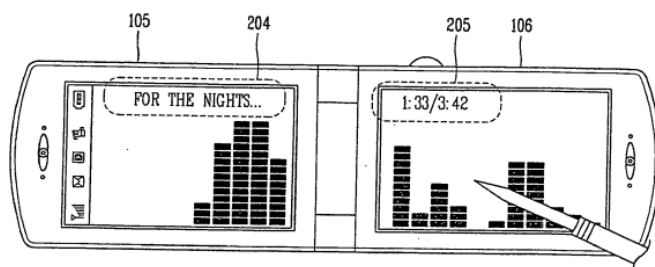
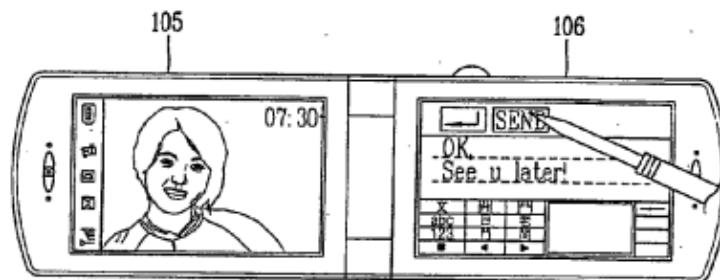


FIG. 11B

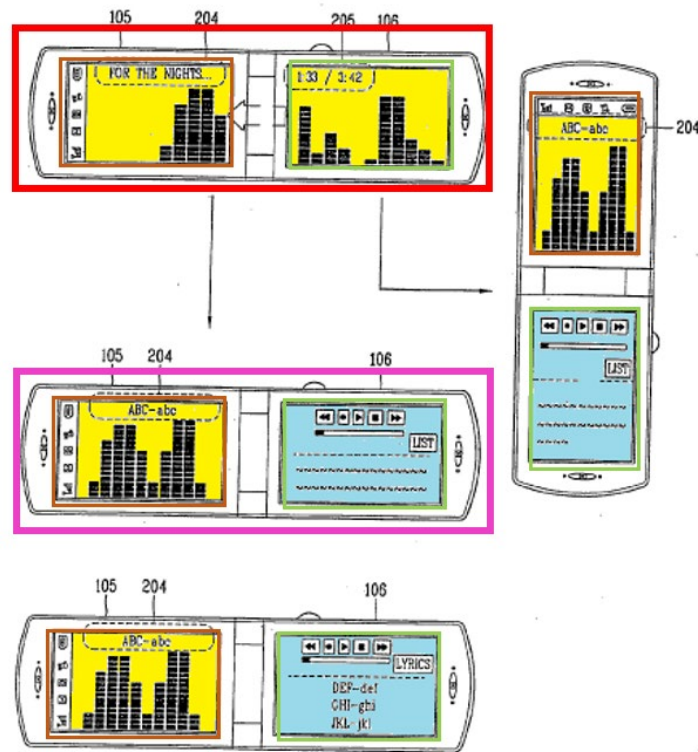


D. Claim 6 - The method of claim 1, wherein a fourth input is an instruction to minimize a selected one of the first or second desktops or applications, resulting in the selected one being displayed only one of the first and second displays.

130. In my opinion, Lee discloses this limitation.

131. Lee discloses that the first window is automatically minimized to fit the first display and then displayed on the first display after receiving an input, such as a screen rotation. Ex. 1005, Fig. 9. As shown below with reference to the red and green boxes in annotated Fig. 9, the first window of the first application (indicated by a bright red box) is automatically minimized to fit the smaller area size occupied by the first display (indicated by an orange box). Ex. 1005, ¶[0049]. Lee describes how the original window is minimized and may only display a “portion of the original image” from the two-display format. Ex. 1005, Fig. 9, ¶[0048].

FIG. 9



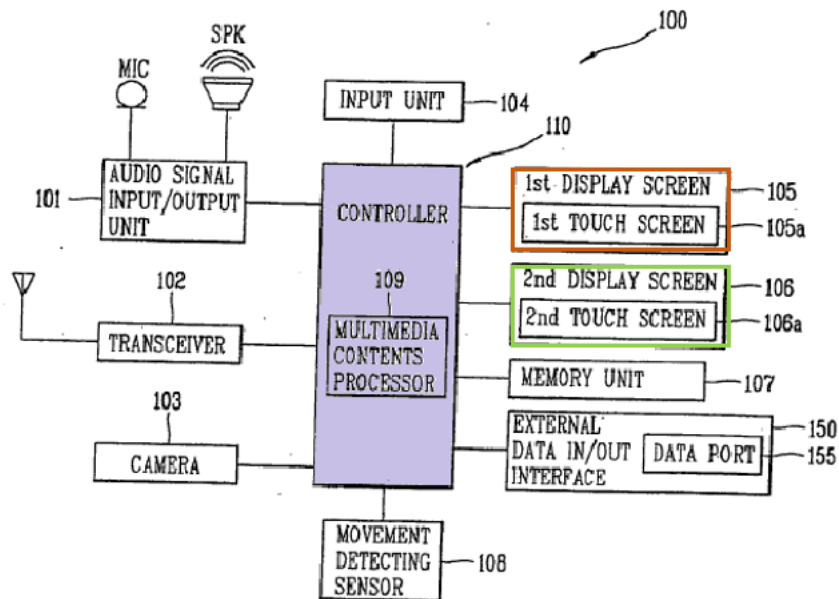
E. Claim 7

- 1. 7[P] A non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method, the instructions comprising:**

132. To the extent the preamble is limiting, in my opinion, Lee discloses this limitation.

133. As I explained earlier, Fig. 1 (annotated below) describes how Lee's device uses a Multimedia Contents Processor to manage and control a 1st display and a 2nd display. Ex. 1005, Fig. 1, ¶[0027].

FIG. 1



2. 7[A] instructions configured to receive a first predetermined input that represents an instruction to determine and reveal a first desktop or application on a first display of the multi-display device;

134. In my opinion, Lee discloses this limitation for at least the reasons I discuss for claim 1[A].

3. 7[B] instructions configured to receive a second predetermined input that represents an instruction to determine and reveal a second desktop or application on a second display of the multi-display device;

135. In my opinion, Lee discloses this limitation for at least the reasons I discuss for claim 1[B].

4. **7[C] instructions configured to respond to the first and second predetermined inputs with outputs that cause the first desktop or application to be displayed on the first display and cause the second desktop or application to be displayed on the second display:**

136. In my opinion, Lee discloses this limitation for at least the reasons I discuss for claims 1[A] and 1[B].

5. **17[D] instructions configured to receive a third predetermined input that represents an instruction to maximize a selected one of the first or second desktops or applications resulting in the selected one being displayed on both of the first and second displays according to the instructions configured to respond to the third predetermined input; and instructions configured to respond to the third predetermined input that causes displaying of the selected one of the first or second desktops or applications in a maximized condition.**

137. In my opinion, Lee discloses this limitation for at least the reasons I discuss for claim 1[C].

- F. **Claim 9 - The computer-readable medium of claim 7 wherein a fourth predetermined input is an instruction to minimize a selected one of the first or second desktops or applications, resulting in the selected one being displayed only one of the first and second displays according to the instructions configured to respond to the third predetermined input.**

138. In my opinion, Lee discloses this limitation for at least the reasons I discuss for claim 6.

XIII. GROUND 4: CLAIMS 1-3, 6, 7, AND 9 ARE OBVIOUS OVER LEE

139. It is my opinion that if the Board finds that Lee does not anticipate Challenged Claims 1-3, 6, 7, and 9, then such Challenged Claims are rendered obvious by Lee.

140. Certain phrases used throughout Lee may differ from the terminology used in the '756 patent. For example, Lee may refer to a “display screen,” but I find no meaningful distinction between this phrase and what the '756 patent defines a “display” as. The same is true for other terminology differences between Lee and the '756 patent. *See, e.g.:*

The above-described first display screen 105 and second screen 106 can be implemented in a same hardware configuration (i.e., one big display screen being partitioned to have separate display region) or be implemented as the separate independent units respectively. In accordance with some embodiments of the present invention, at least one display screen can be allocated to perform the input unit function by incorporating the touch sensitive screen. The input unit can be conventional key input units as understood by one skilled in the art and separately arranged from the display screens.

Ex. 1005, ¶[0035].

The term “display” refers to a portion of one or more screens used to display the output of a computer to a user.

Ex. 1001, 5:1-2.

141. Lee discloses a device and provides numerous examples of how its split-screen management program can be interacted with and manipulated to affect the screen and display output on Lee's exemplary device. A POSITA would have understood that the examples Lee provided are all associated, so that one could achieve various results by implementing the many functionalities Lee describes. Thus, a POSITA would have been motivated to try each and every one of Lee's disclosed examples, in various sequences and in relation to each other.

XIV. GROUND 5: CLAIMS 1-3, 6, 7 AND 9 ARE ANTICIPATED BY AGUILAR

142. I have reviewed and am familiar with U.S. Patent No. 8,677,284 B2 ("Aguilar") filed on November 4, 2009, published on May 5, 2011, and issued on March 18, 2004.

143. In my opinion, based on the following analysis, claims 1-3, 6, 7 and 9 of the '756 patent are invalid as anticipated by Aguilar.

A. Claim 1

- 1. [1P] A method of displaying a plurality of desktops and/or applications, each having at least one window, on a multi-display device, comprising:**

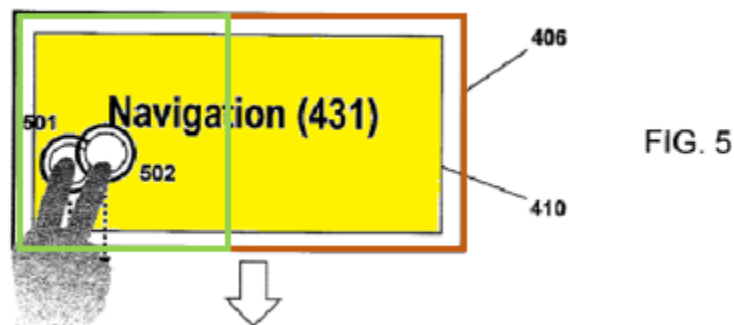
144. To the extent the preamble is limiting, in my opinion, Aguilar discloses this limitation. Similar to Yook and Lee, explained in the above sections, Aguilar describes an exemplary device that includes software and hardware permitting a

user to perform different functions or methods related to outputting the display of a plurality of applications. *See, e.g.*, Ex. 1006, Abstract.

2. [1A] receiving, by a processor, a first input that represents an instruction to reveal one of a desktop or application on a first display of the multi-display device; selecting, by the processor, a first desktop or application to display on the first display;

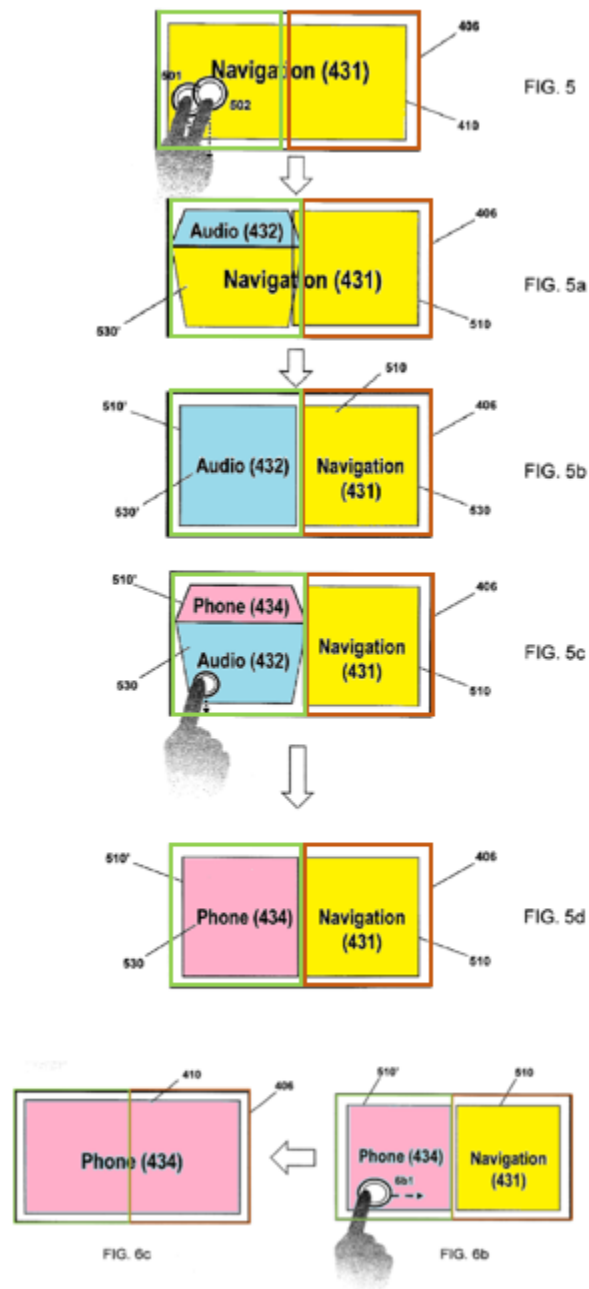
145. In my opinion, Aguilar discloses this limitation.

146. Aguilar explains the concept of using a virtual spindle metaphor, allowing the user to select any number of potential applications for display. Ex. 1006, Abstract, Fig. 4; 5:20-37; 5:5-6:3. In Fig. 5, Aguilar provides an example of selecting a Navigation application on an exemplary device, revealing the application on both the first screen or display (orange box) and the second screen or display (green box). *Id.*, Fig. 5. This process can be used to display any other application, including a Phone or Audio application. *Id.*, Fig. 5 6:23-47.



Aguilar's device has at least a first display (indicated by an orange box) and a second display (indicated by a green box). As shown below in Figs. 5 and 6, a "user can also

split the user interface to at least two display segments which may contain different applications.” Ex. 1006, Fig. 5, 5a-d, 6c, 6b, 5:13-16.



147. Aguilar shows the screen splitting between a Navigation application and an Audio application in one example (Fig. 5b) and splitting between a Navigation

application and a Phone application in another (Fig. 6b). Ex. 1006, 6:48-7:10. Thus, if a first application is required to be initially only displayed on a single display, Aguilar meets the claim as well.

148. Aguilar explains that “if the user wishes to have a ‘dual view’ on the screen 410, the user may be allowed to split the screen 410 into at least two display segments (530, 530’) by using the ‘two finger dragging down’ gesture...” Ex. 1006, 6:48-52. As shown in Fig. 9 (annotated below) of Aguilar, there is a display controller, CPU, VRAM, and video generating unit (purple) that are part of the process for storing and executing the instructions and commands to perform the screen splitting functions for the user interface. Ex. 1006, 9:13-25. A POSITA would further understand that a VRAM (video random-access memory) is a memory unit, which is a non-transitory computer readable medium because it stores operational programs in a mobile device.

In another embodiment shown in FIGS. 5, 5 a and 5 b, if the user wishes to have a “dual view” on the screen 410, the user may be allowed to split the screen 410 into at least two display segments (530, 530’) by using the “two finger dragging down” gesture exemplified in the table 408 in FIG. 4 a. As described above, the location detecting device 401 detects the location of the user's fingers (501, 502) and the gesture interpreting device 402 is adapted to interpret and recognize the user's gesture. In the current embodiment, the gesture interpreting device 402 may further

include a touch sensor (not shown) to detect the number of the user's finger on the screen 410. Once the touch sensor determines the number of the user's finger, such information is transmitted to the gesture interpreting device 402 to recognize the finger gesture, and the controller 404 starts and controls the screen splitting process. The screen 410 can be split when a smaller spindle 530' starts to spin by the two-finger gesture and the screen splitting process may stop when one of the application panels (e.g. Audio 432) is mainly shown on one side of the screen 510'.

Ex. 1006, 6:48-6:67.

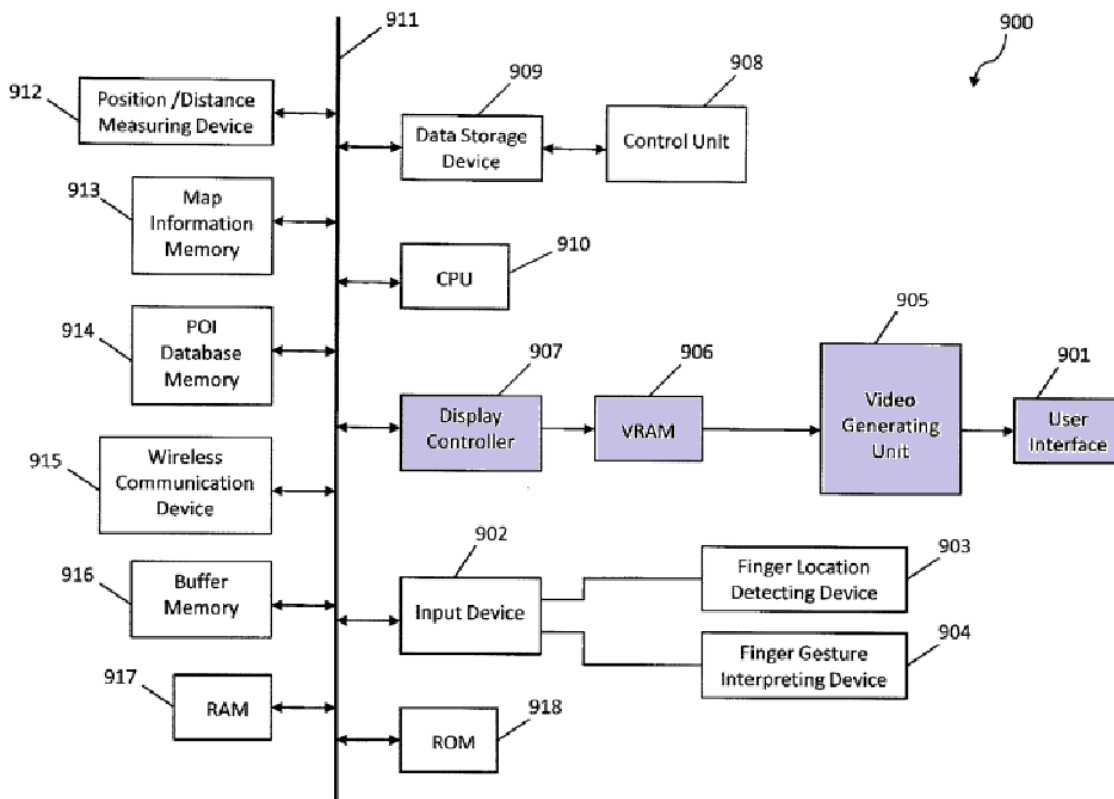


FIG. 9

Ex. 1006, Fig. 9.

3. **[1B] receiving, by the processor, a second input that represents an instruction to reveal one of a desktop or application on a second display of the multi-display device; selecting, by the processor, a second desktop or application to display on the second display;**

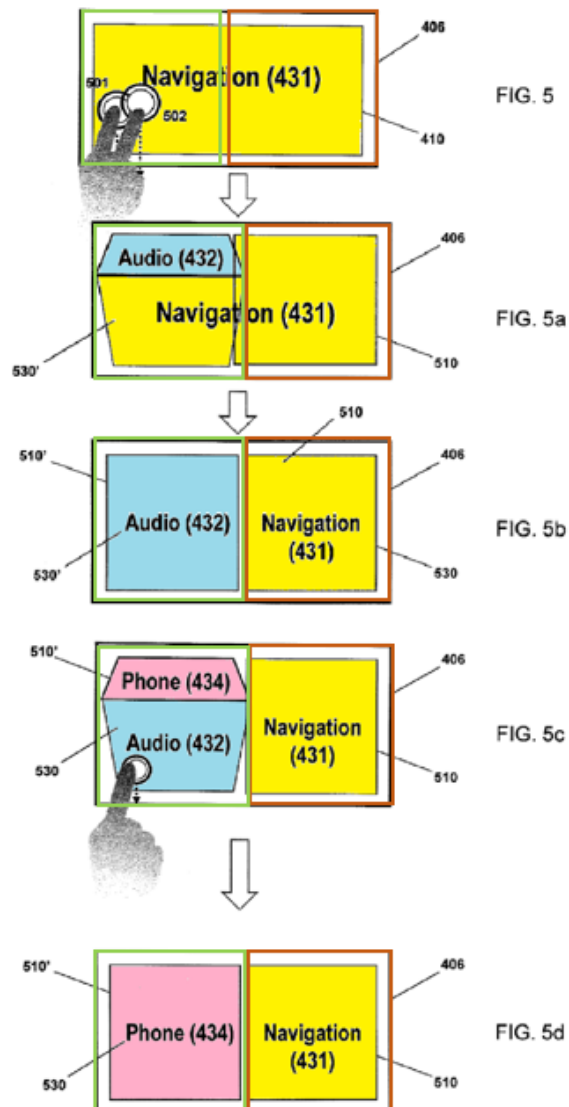
149. In my opinion, Aguilar discloses this limitation.

150. Aguilar's device employs a virtual spindle, whereby a user selects application from a stack of applications rotating around a virtual axle. Ex. 1006, Abstract, Fig. 4; 5:20-37; 5:54-6:3. Aguilar explains that the user can select from spindles of various sizes, corresponding to display area. *See, e.g.*, Ex. 1006, Abstract, 6:23-47 For example, as demonstrated in Figs. 5-5d (annotated below), the user can select from a smaller spindle of applications to display on only the second display (indicated by the orange box). Ex. 1006, 7:1-7. In the example shown, the user can select the Audio application (Fig. 5b), but if the user keeps scrolling around the smaller spindle, as shown in Fig. 5c, the Phone application may be selected and revealed on the second display (Fig. 5d), or any other application that the user desires. *Id.*

Similar to the spindle 430, the smaller spindle 530' includes a plurality of application panels and if the user wants to view other application panels on the smaller spindle 530' while using the Navigation 431, *the user can simply use one finger to spin the smaller spindle 530' at the lower corner of the left side of the screen 510' until a desirable application is found*, as shown in

FIGS. 5 c and 5 d. The user can also view the content of each application panel in the smaller spindle 530' by either pressing or tapping twice on the corresponding application panel, as previously shown in FIGS. 4 d and 4 e.

Ex. 1006, Fig. 5, 5a-d, 6c, 6b, 7:1-7.



4. **[1C] receiving, by the processor, a third input that represents an instruction to maximize a selected one of the first or second desktops or applications resulting in the selected one being displayed on both of the first and second displays; and displaying, by the processor, the selected one of the first or second desktops or applications in a maximized condition.**

151. In my opinion, Aguilar discloses this limitation.

152. Figs. 5-6 (annotated below) show that either of the applications may be maximized to be displayed on both the first and second displays. Ex. 1006, 6:48-67. An application can be selected for display on either the first or second displays via a smaller spindle via the process demonstrated in Figs. 5-5d. Ex. 1006, 6:48-7:10. If the user decides to select two different applications to display, each one displayed on a separate logical display, then Aguilar's device provides a method for the user to maximize either of those applications. Ex. 1006, Fig. 5, 5a-d, 6c, 6b, 7:38-54.



In another embodiment, the user can use simple finger gesture to close an unwanted application. Referring to FIGS. 6 and 6 a, the user can spin the smaller spindle 530' to select a different application by dragging down the screen 510' with one finger, as previously shown in FIGS. 5 c and 5 d. As can be seen in FIG. 6

b, two applications, Phone 434 and Navigation 431, are located on the display segments 510' and 510, respectively. If the user wishes to close the Navigation 431 application, the user can simply slide the Phone 434 application on the display segment 510' to the Navigation 431 on the display segment 510, and *the two display segments 510 and 510 will be merged to the screen 410 with the Phone 434 application thereon*, as shown in FIG. 6 c. On the other hand, *if the user wants to keep the Navigation application 431 and get rid of the Phone application 434, the user can slide the Navigation application 431 to the left side where the Phone application 434 is located.*

Ex. 1006, 7:38-54.

153. When the user maximizes either of the applications, a third input has been received by the processor that causes one of the first or second applications to be displayed on both the first and second displays in a maximized condition.

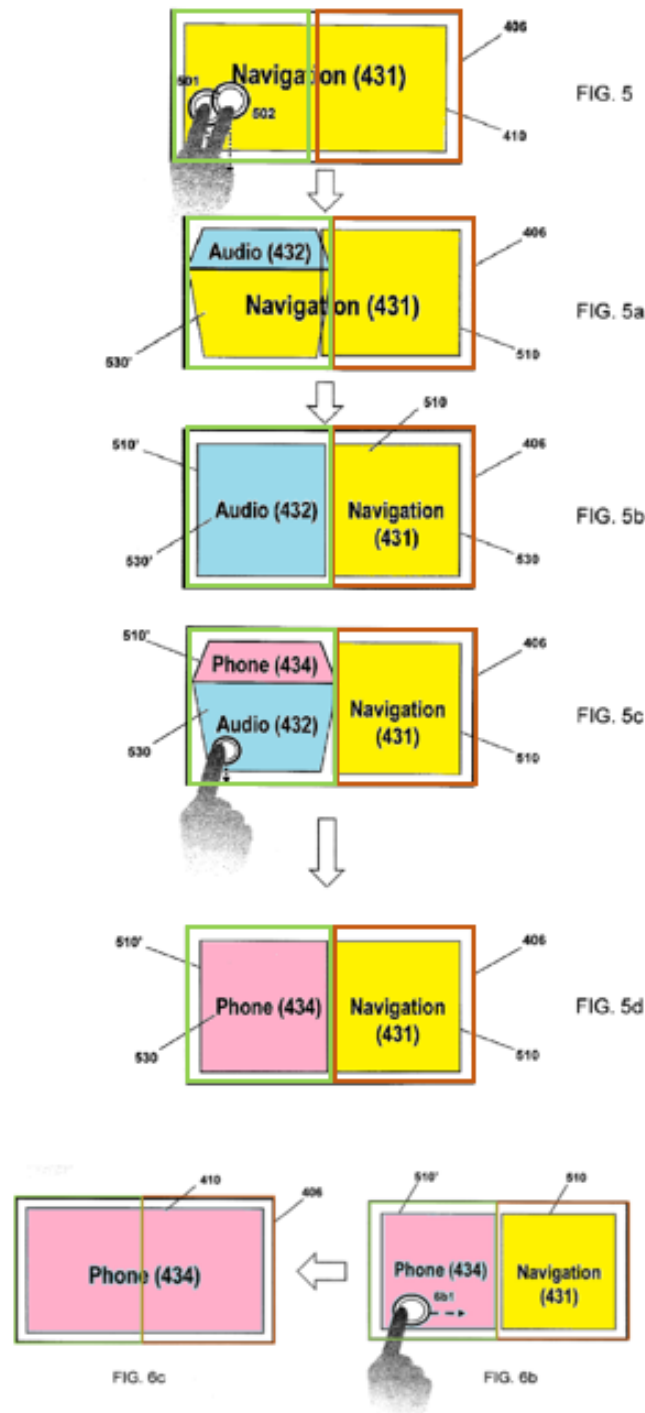
B. Claim 2 - The method of claim 1, wherein at least one of the first, second, and third inputs is achieved by at least a user input gesture.

154. In my opinion, Aguilar discloses this limitation.

155. Aguilar's device expressly includes a "touch sensor" and is described as "gesture interpreting device" to "interpret the user's finger gesture on the display unit 406." Ex. 1006, 5:20-37. These gesture inputs are mimicked in the figures

below by a depiction of the user's fingers implementing the inputs from claim 1.

Ex. 1006, Fig. 5, 5a-d, 6c, 6b, 7:1-10.



C. Claim 3 - The method of claim 1, wherein the third input is a user gesture comprising at least one of a tap or long hold gesture.

156. In my opinion, Aguilar discloses this limitation.

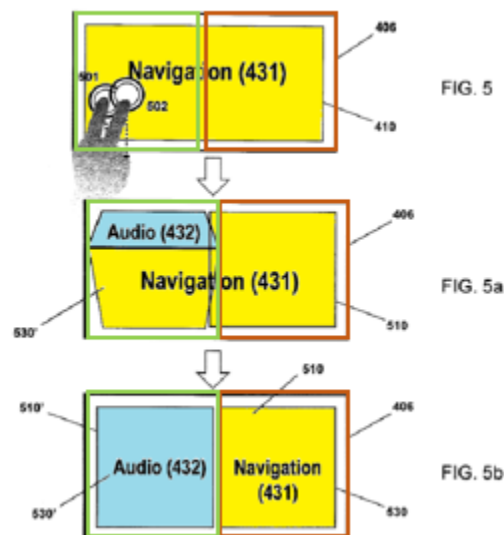
157. As discussed in Section XIV.B, Aguilar discloses that a user's fingers may tap the screen to choose the application to display on the device. The user may also long hold on the screen to drag one of the applications from the split-screen display to the maximized display as shown in Figs. 6b and 6c.

D. Claim 6 - The method of claim 1, wherein a fourth input is an instruction to minimize a selected one of the first or second desktops or applications, resulting in the selected one being displayed only one of the first and second displays.

158. In my opinion, Aguilar discloses this limitation.

159. Aguilar discloses that the first application (indicated in yellow) is automatically resized to fit on only the second display (indicated by a green box).

Ex. 1006, Fig. 5, 5a, 5b, 6:48-7:63.



E. Claim 7

- 1. 7[P] A non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method, the instructions comprising:**

160. To the extent the preamble is limiting, in my opinion, Aguilar discloses this limitation.

161. Fig. 9 (annotated below) is a block diagram showing an example structure for implementing the method for controlling and displaying contents on Aguilar's exemplary device. Ex. 1006, 4:39-42. Aguilar discloses a CPU, display controller, VRAM, and video generating unit as part of the process for storing and executing the instructions and commands to perform the screen splitting functions for the user interface. Ex. 1006, 9:13-25. A POSITA would further understand that a VRAM (video random-access memory) is a memory unit, which is a non-transitory computer readable medium because it stores operational programs in a mobile device.

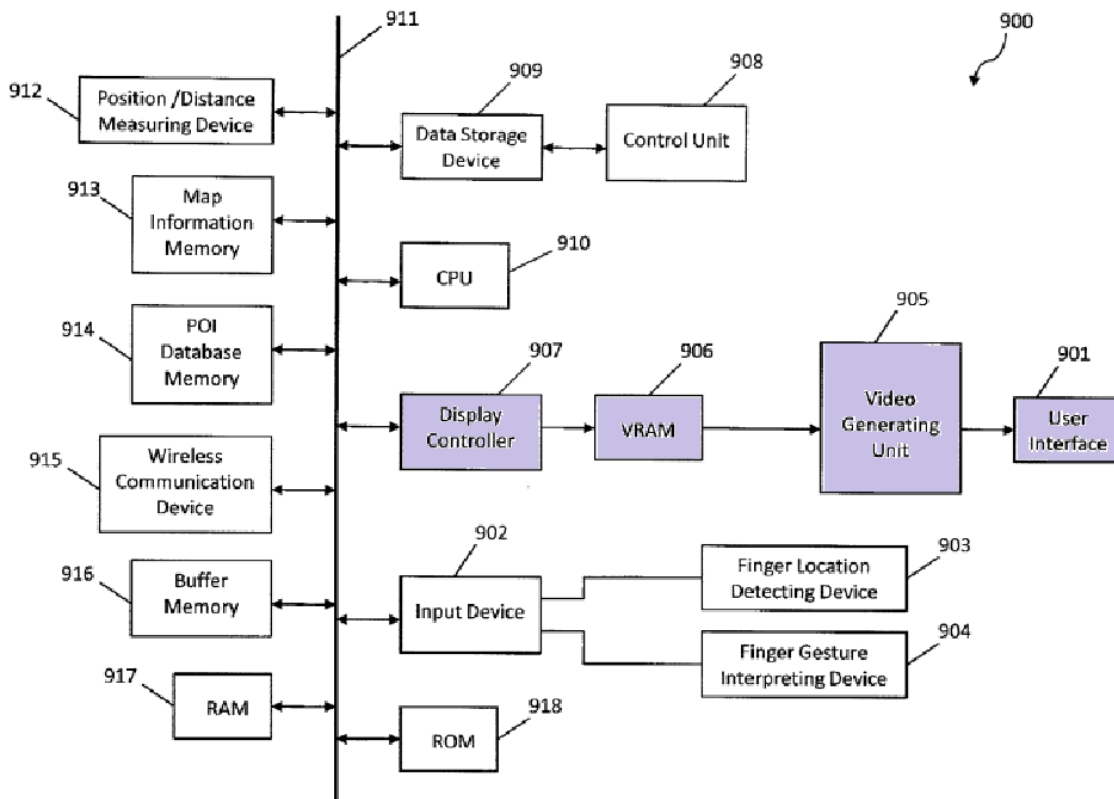


FIG. 9

2. **7[A] instructions configured to receive a first predetermined input that represents an instruction to determine and reveal a first desktop or application on a first display of the multi-display device;**

162. In my opinion, Aguilar discloses this limitation for at least the reasons I discuss for claim 1[A].

3. **7[B] instructions configured to receive a second predetermined input that represents an instruction to determine and reveal a second desktop or application on a second display of the multi-display device;**

163. In my opinion, Aguilar discloses this limitation for at least the reasons I discuss for claim 1[B].

4. **7[C] instructions configured to respond to the first and second predetermined inputs with outputs that cause the first desktop or application to be displayed on the first display and cause the second desktop or application to be displayed on the second display:**

164. In my opinion, Aguilar discloses this limitation for at least the reasons I discuss for claims 1[A] and 1[B].

5. **17[D] instructions configured to receive a third predetermined input that represents an instruction to maximize a selected one of the first or second desktops or applications resulting in the selected one being displayed on both of the first and second displays according to the instructions configured to respond to the third predetermined input; and instructions configured to respond to the third predetermined input that causes displaying of the selected one of the first or second desktops or applications in a maximized condition.**

165. In my opinion, Aguilar discloses this limitation for at least the reasons I discuss for claim 1[C].

- F. **Claim 9 - The computer-readable medium of claim 7 wherein a fourth predetermined input is an instruction to minimize a selected one of the first or second desktops or applications, resulting in the selected one being displayed only one of the first and second displays according to the instructions configured to respond to the third predetermined input.**

166. In my opinion, Aguilar discloses this limitation for at least the reasons I discuss for claim 6.

XV. GROUND 6: CLAIMS 1-3, 6, 7 AND 9 ARE OBVIOUS OVER AGUILAR

167. It is my opinion that if the Board finds that Aguilar does not anticipate Challenged Claims 1-3, 6, 7 and 9, then such Challenged Claims are rendered obvious by Aguilar.

168. Certain phrases used throughout Aguilar may differ from the terminology used in the '756 patent. For example, Aguilar may refer to “display segments,” but I find no meaningful distinction between these phrases and what the '756 patent defines a “display” as. The same is true for other terminology differences between Aguilar and the '756 patent. *See, e.g.:*

A user interface with multiple applications which can be operated concurrently and/or independently by using simple finger gestures allows a user to intuitively operate and control digital information, functions, applications, etc. to improve operability. The user is able to use finger gesture to navigate the user interface via a virtual spindle metaphor to select different applications. The user can also split the user interface to at least two display segments which may contain different applications. Moreover, each display segment can be moved to a desirable location on the user interface to provide a seamless operation environment.

Ex. 1006, Abstract

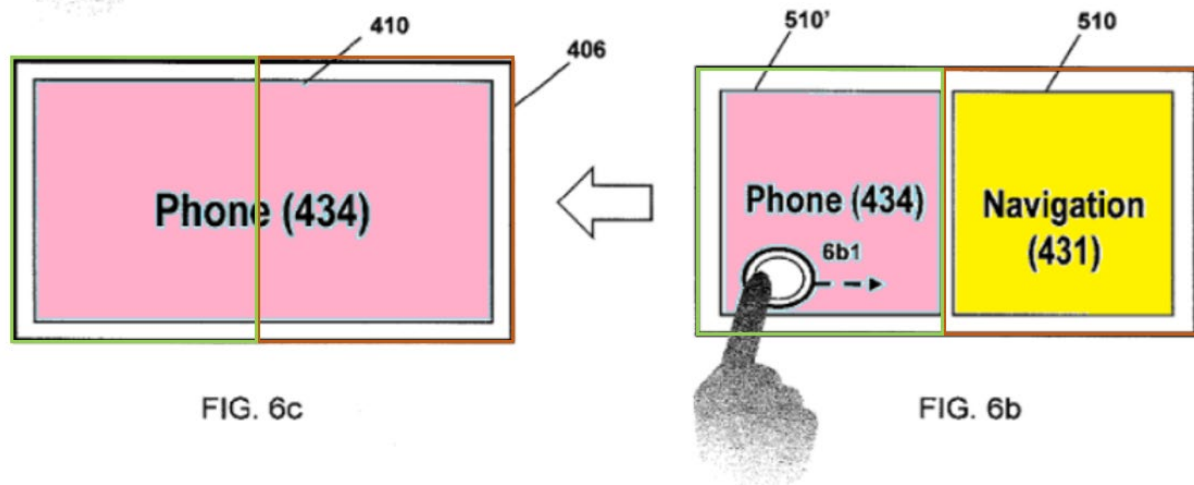
The term “display” refers to a portion of one or more screens used to display the output of a computer to a user.

Ex. 1001, 5:1-2.

169. Aguilar discloses a device and provides numerous examples of how its split-screen management program can be interacted with and manipulated to affect the screen and display output on Aguilar's exemplary device. A POSITA would have understood that the examples Aguilar provided are all associated, so that one could achieve various results by implementing the many functionalities Aguilar describes. Thus, a POSITA would have been motivated to try each and every one of Aguilar's disclosed examples, in various sequences and in relation to each other.

170. With respect to dependent claims 4 and 8, it is my opinion that, to the extent the Board finds that Aguilar does not anticipate those claims, then Aguilar renders those claims obvious.

171. Claims 4 and 8 are both directed to a displayed visual indicator signifying that an application can be maximized. As I explained in Section XIV, Aguilar discloses various ways an application can be maximized, such as when a user initiates a tap or long hold gesture on the touch screen indicating a minimized application should enter full screen mode. Aguilar's system includes visual indicators that a maximization event is occurring when the user initiates these gestures. Ex. 1006, Figs. 6b-6c.



172. To the extent Patent Owner argues that the visual cue must be present on the display before the user gesture, then in my opinion, a POSITA would have found such a visual indicator obvious in view of Aguilar.

173. Minimizing and maximizing applications on a display was a common and routine operation on computers and computing devices for decades prior to the 2011 alleged date of invention for the '756 patent. The very references cited herein included visual indicators (e.g., icons) on the screen for maximizing a window. For example, in Sections XVI and XVII below, I explain that Windows operating systems at the time of Purcell circa 2007 included well-known visual indicators for minimizing and maximizing applications and their associated windows. Thus, a POSITA would not have understood the inclusion of a visual maximization indicator on Aguilar's system to be inventive or novel – to the contrary, a POSITA

would have found such an icon to be an existing, prevalent, and obvious function on computing devices in 2011.

XVI. GROUND 7: CLAIMS 1-3, 6, 7, AND 9 ARE ANTICIPATED BY PURCELL

174. I have reviewed and am familiar with U.S. Patent Pub. App. No. 2007/0084645 A1 (“Purcell”) filed on October 12, 2006, claiming priority to Korean provisional application number 97136/2005 filed on September 15, 2005, and published on April 19, 2007.

175. In my opinion, based on the following analysis, claims 1, 3-5, 6, 7, and 9 of the ’756 patent are invalid as anticipated by Purcell.

A. Claim 1

1. 1[P] A method of displaying a plurality of desktops and/or applications, each having at least one window, on a multi-display device, comprising:

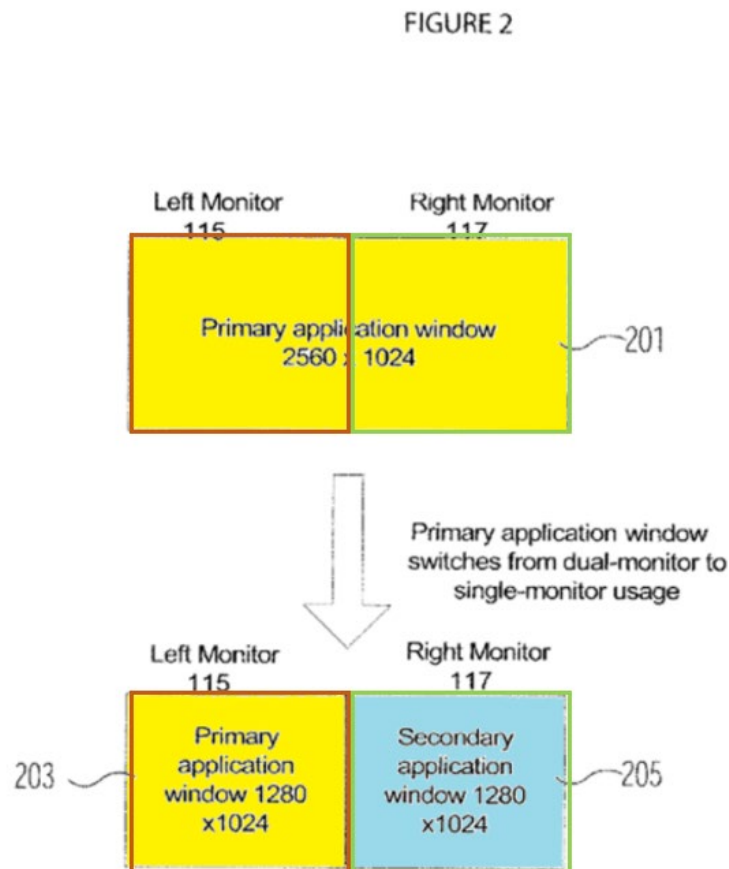
176. To the extent the preamble is limiting, in my opinion, Purcell discloses this limitation.

177. Similar to Yook, Lee, and Aguilar, explained in the above sections, Purcell describes an exemplary system and device that includes software and hardware permitting a user to perform many different functions related to outputting the display of multiple applications. *See, e.g.*, Ex. 1007, Abstract.

178. Purcell provides an exemplary device with a first display (indicated with an orange box) and a second display (indicated with a green box). Ex. 1007,

Fig. 2, ¶[0016]. As shown in Fig. 2, Purcell is directed to a system with multiple display monitors that is used to display multiple applications at the same time to a user.

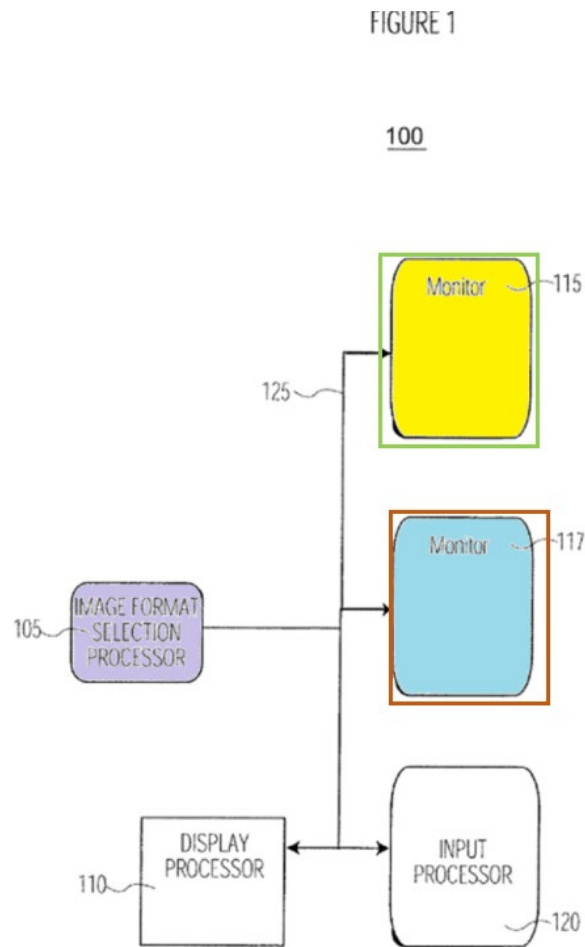
Ex. 1007, Fig. 2, Abstract.



2. **1[A] receiving, by a processor, a first input that represents an instruction to reveal one of a desktop or application on a first display of the multi-display device; selecting, by the processor, a first desktop or application to display on the first display;**

179. In my opinion, Purcell discloses receiving an input to a processor to cause a first application to be revealed on the first display.

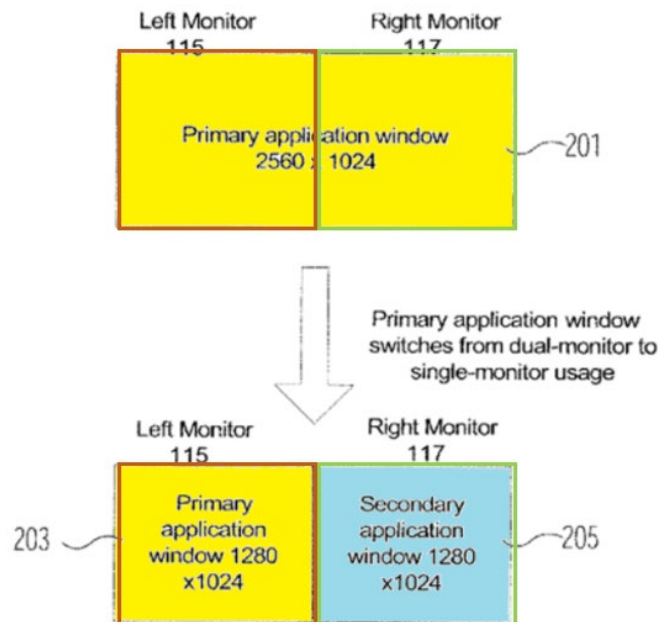
180. Fig. 1 discloses that Purcell's system contains an image format determination system, which includes an input processor for receiving command data. Ex. 1007, ¶[0004]. Together, this system and processor execute computer readable instructions stored in the system in order to perform the method steps. Ex. 1007, Fig. 1, ¶¶[0013]-[0015].



181. As shown in Fig. 2 (annotated below), Purcell's system allows a primary application window (element 201, indicated in yellow below) to be displayed on either one or both displays. Ex. 1007, ¶[0016]. Thus, Purcell discloses that the primary

application can be displayed on both monitors/displays or only on the first display. *See, e.g.,* Fig. 2.

FIGURE 2



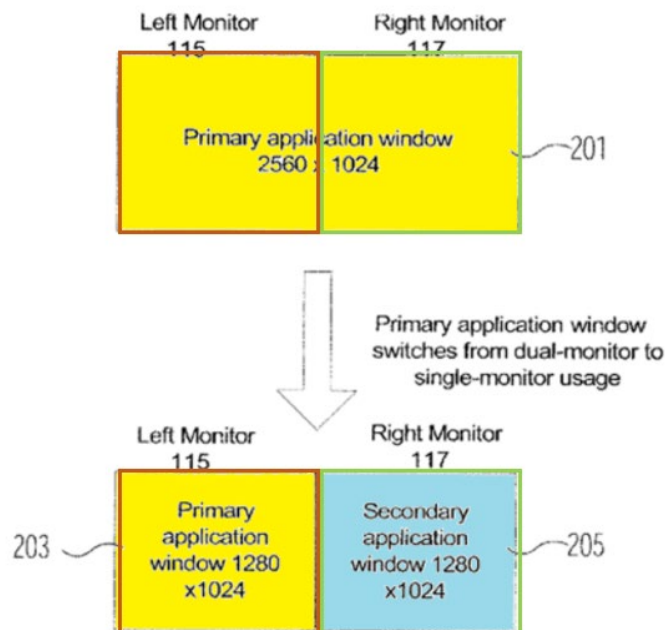
3. **1[B] receiving, by the processor, a second input that represents an instruction to reveal one of a desktop or application on a second display of the multi-display device; selecting, by the processor, a second desktop or application to display on the second display;**

182. In my opinion, Purcell discloses receiving a second input to reveal a second application, and in response to that input, displaying a second application on the second display.

183. Purcell describes how “to permit another application to execute concurrently and display an image window adjacent to an image window of the

primary application, system 100 dynamically changes the primary application image window size to match that of a left monitor (monitor 115).” Ex. 1007, ¶[0016]. The system then “initiates execution of a secondary application that displays an associated image window on the right monitor (117).” *Id.*; see also Fig. 2.

FIGURE 2



4. **1[C] receiving, by the processor, a third input that represents an instruction to maximize a selected one of the first or second desktops or applications resulting in the selected one being displayed on both of the first and second displays; and displaying, by the processor, the selected one of the first or second desktops or applications in a maximized condition.**

184. In my opinion, Purcell discloses a third input received by the processor that causes one of the first or second applications to be displayed on both the first and second displays in a maximized condition.

185. Purcell explains that upon user input, Purcell's system can maximize one of the two applications to be displayed on both displays.

Display processor 110 in system 100 in one embodiment in step 707, initiates generation of data representing the first image window comprising a reduced size version of the first size image on the first display monitor of the plurality of display monitors to prevent mutual overlap of the reduced size first image window and the second image window on the first display monitor. In another embodiment display processor 110 in system 100 initiates generation of data representing the reduced size first image window and the second image window, for presentation on the plurality of display monitors. The reduced size first image window is presented on a first monitor of the plurality of display monitors and the second image window is presented on a different second monitor of the plurality of display monitors. The first image window prior to the size reduction encompasses the first monitor

and the different second monitor. In response to a user command to terminate execution of the second application or a function of the second application, the image format selection processor automatically initiates increase in size of the first image window to fit a screen of a monitor of the plurality of display monitors. In another embodiment, in response to a user command to terminate execution of the second application or a function of the second application, the image format selection *processor automatically initiates increase in size of the first image window to encompass display screens of the first monitor and the different second monitor*. The process of FIG. 3 ends at step 713.

Ex. 1007, ¶[0020].

A system according to claim 10, wherein in response to a user command to terminate execution of said function of said second application, said image format selection processor automatically initiates increase in size of said first image window to encompass display screens of said plurality of monitors.

Ex. 1007, claim 12.

B. Claim 2 - The method of claim 1, wherein at least one of the first, second, and third inputs is achieved by at least a user input gesture.

186. In my opinion, Purcell discloses that at least one of the first, second, or third inputs is a user input gesture.

187. Purcell’s system operates based upon a user interacting with its “user interface” that receives “user commands.” Ex. 1007, ¶¶[0015], [0020]. Such user commands include well-known user inputs for Windows-based devices, such as “ALT+TAB command,” “Windows Taskbar,” or “clicking on an un-obscured portion of the secondary application window.” *Id.*, ¶[0003]. For example, Purcell indicates that the “user enters the command using a keyboard, mouse, a touch screen, a microphone or a voice recognition application...” *Id.*, ¶[0013]. These are all “user input gestures.”

C. Claim 3 - The method of claim 1, wherein the third input is a user gesture comprising at least one of a tap or long hold gesture

188. In my opinion, Purcell discloses that the third input is a user gesture that can be a tap or a long hold gesture.

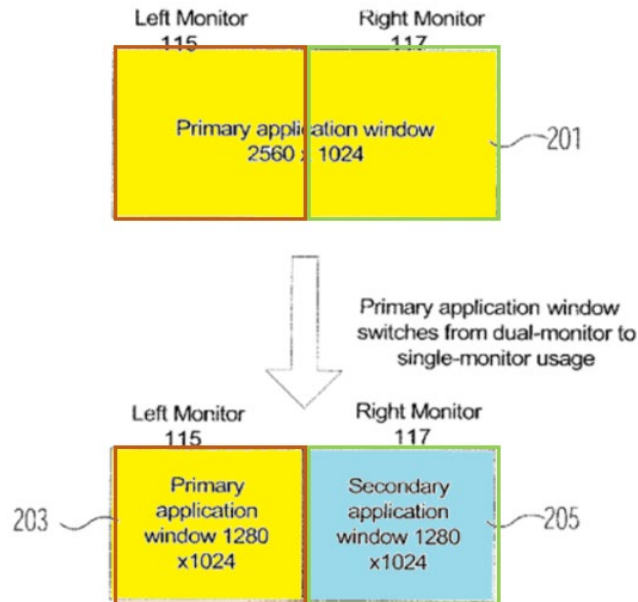
189. As I explained above, Purcell discloses that a “user enters the command using a keyboard, mouse, a touch screen, a microphone or a voice recognition application...” Ex. 1007, ¶[0013]. A user input via touch screen would require the user to “tap” on the touch screen in order to input the command.

D. Claim 6 - The method of claim 1, wherein a fourth input is an instruction to minimize a selected one of the first or second desktops or applications, resulting in the selected one being displayed only one of the first and second displays.

190. In my opinion, Purcell discloses that a fourth input can minimize one of the first or second applications to be displayed only on one of the first or second display.

191. Purcell's system, based on user input, "initiates execution of a secondary application that displays an associated image window on the right monitor (117)." Ex. 1007, ¶[0016]. As I explained above for claim 1, Purcell discloses a dynamic resizing process. Via this process, the primary application window changes size and is reduced to a portion of the amount of pixels it displays. *Id.*, ¶¶[0016], [0019]. Purcell explains that "to permit another application to execute concurrently and display an image window adjacent to an image window of the primary application, *system 100 dynamically changes the primary application image window size to match that of a left monitor* (monitor 115)." *Id.* This dynamic resizing process is demonstrated in Fig. 2 (annotated below). *Id.*, Fig. 2.

FIGURE 2



Ex. 1007, Fig. 2.

E. Claim 7

1. **7[P] A non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method, the instructions comprising:**

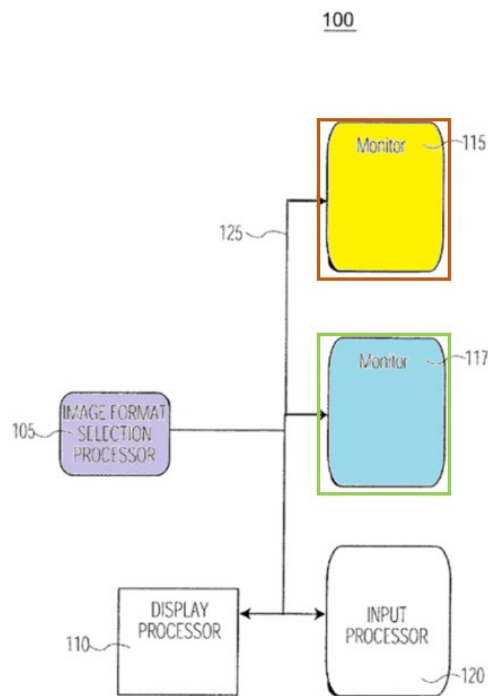
192. To the extent the preamble is limiting, in my opinion, Purcell discloses this limitation.

A user interface system ensures a primary executable application main image window displays on both monitors in a dual-monitor system and automatically switches between single and dual-monitor usage as necessary to permit other applications to operate concurrently with the primary application. A system including

multiple display monitors for displaying multiple user interface image windows associated with corresponding multiple executable applications employs an image format determination system. The image format determination system includes an input processor for receiving command data representing a command to initiate execution of a function of a second application and display of an associated second image window in response to user entry of a command via a first image window associated with a first application. An image format selection processor, in response to the received command data, automatically initiates reduction in size of the first image window to fit a screen of the multiple display monitors and to prevent mutual overlap of the reduced size first image window and the second image window. A display processor initiates generation of data representing the reduced size first image window and the second image window, for presentation on the multiple display monitors.

Ex. 1007, ¶[0004]. The instructions are stored in memory and executed by a processor (purple) to execute the claimed method. Ex. 1007, Fig. 1, ¶¶[0013]-[0015].

FIGURE 1



2. **7[A] instructions configured to receive a first predetermined input that represents an instruction to determine and reveal a first desktop or application on a first display of the multi-display device;**

193. In my opinion, Purcell discloses this limitation for at least the reasons I discuss for claim 1[A].

3. **7[B] instructions configured to receive a second predetermined input that represents an instruction to determine and reveal a second desktop or application on a second display of the multi-display device;**

194. In my opinion, Purcell discloses this limitation for at least the reasons I discuss for claim 1[B].

4. **7[C] instructions configured to respond to the first and second predetermined inputs with outputs that cause the first desktop or application to be displayed on the first display and cause the second desktop or application to be displayed on the second display:**

195. In my opinion, Purcell discloses this limitation for at least the reasons I discuss for claims 1[A] and 1[B].

5. **7[D] instructions configured to receive a third predetermined input that represents an instruction to maximize a selected one of the first or second desktops or applications resulting in the selected one being displayed on both of the first and second displays according to the instructions configured to respond to the third predetermined input; and instructions configured to respond to the third predetermined input that causes displaying of the selected one of the first or second desktops or applications in a maximized condition.**

196. In my opinion, Purcell discloses this limitation for at least the reasons I discuss for claims 1[C].

- F. **Claim 9 - The computer-readable medium of claim 7 wherein a fourth predetermined input is an instruction to minimize a selected one of the first or second desktops or applications, resulting in the selected one being displayed only one of the first and second displays according to the instructions configured to respond to the third predetermined input.**

197. In my opinion, Purcell discloses this limitation for at least the reasons I discuss for claim 6.

**XVII. GROUND 8: ALL CHALLENGED CLAIMS ARE OBVIOUS OVER
PURCELL IN VIEW OF YOOK**

198. In my opinion, based on the following analysis, all Challenged Claims of the '756 patent are invalid as obvious over Purcell in view of Yook.

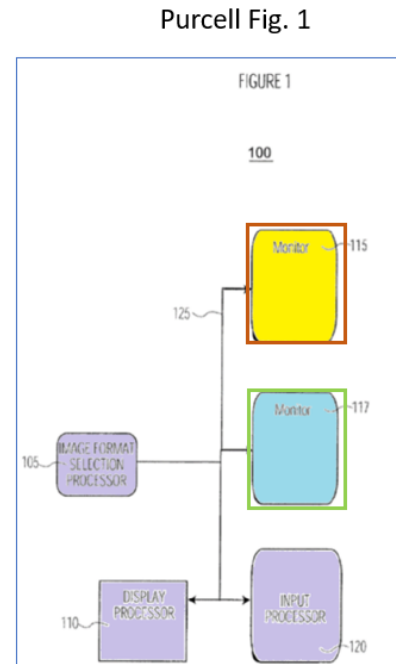
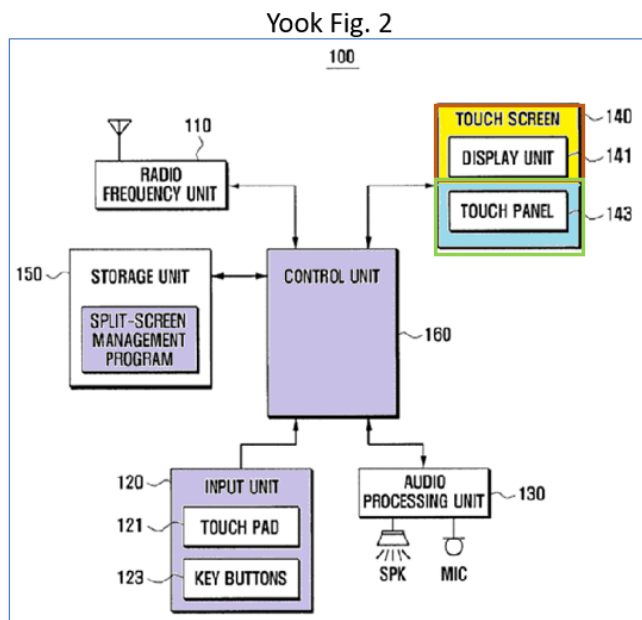
199. For reasons I explain below, a POSITA would have been motivated to combine the teachings of Purcell's dual monitor display system with the teachings of Yook's dual-display system.

200. Purcell teaches a dual monitor display system, and Yook teaches a dual display system. Both of these teachings strive to provide a user with additional user display options that were commonplace in the industry at the time. Both Purcell and Yook are directed to the same general problem of reducing the burden on users wanting to interact with multiple applications at the same time.

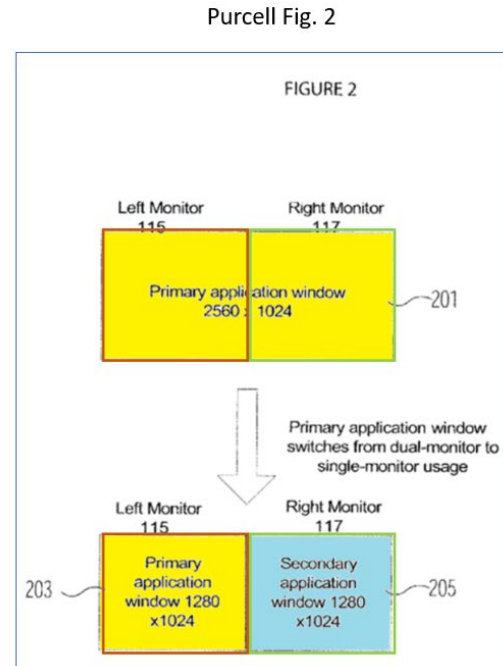
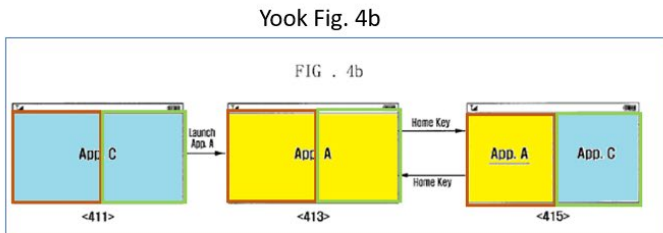
201. Purcell, for example, notes that it was a "burdensome non-user friendly process" to "interact with the secondary application" when a primary application is also running. Ex. 1007, ¶[0003]. Yook notes how users needed to more effectively operate larger screens as the larger display area allowed users to handle multiple applications at the same time. Ex. 1004, ¶[0005].

202. Based on these known problems, both Purcell and Yook developed systems and methods that permitted the simultaneous display of windows from two applications at the same time across multiple displays. Ex. 1004, ¶[0006]; Ex. 1007,

¶[0004]. These systems and methods, designed as solutions so the same problem, both included the use of an input processor, split-screen management program, and a control unit/display unit. Ex. 1004, Fig. 2, Ex. 1007, Fig. 1.



203. Yook's and Purcell's systems and methods are also similar in the way their respective split-screen methods were implemented. Ex. 1004, Fig. 4b, Ex. 1007, Fig. 2.



204. For example, both Purcell and Yook allow a first application window to be displayed on both display portions and then permit a second application window to be displayed on a second display while the first application window occupies the first display. As I explain in Sections X.A and X.F above, both references can then reverse the split screen and revert back to the first application window displayed on both displays, thus enabling a user to toggle between split-screen and full screen mode. Based on these teachings a POSITA would have looked to combine Purcell with Yook at least because they disclose similar hardware and software systems directed to solving the same alleged problem in the prior art.

205. A POSITA would thus have been motivated to combine the teachings of Purcell's dual monitor display system with the teachings of Yook's dual-display

system to achieve additional user display options that were commonplace in the industry at the time.

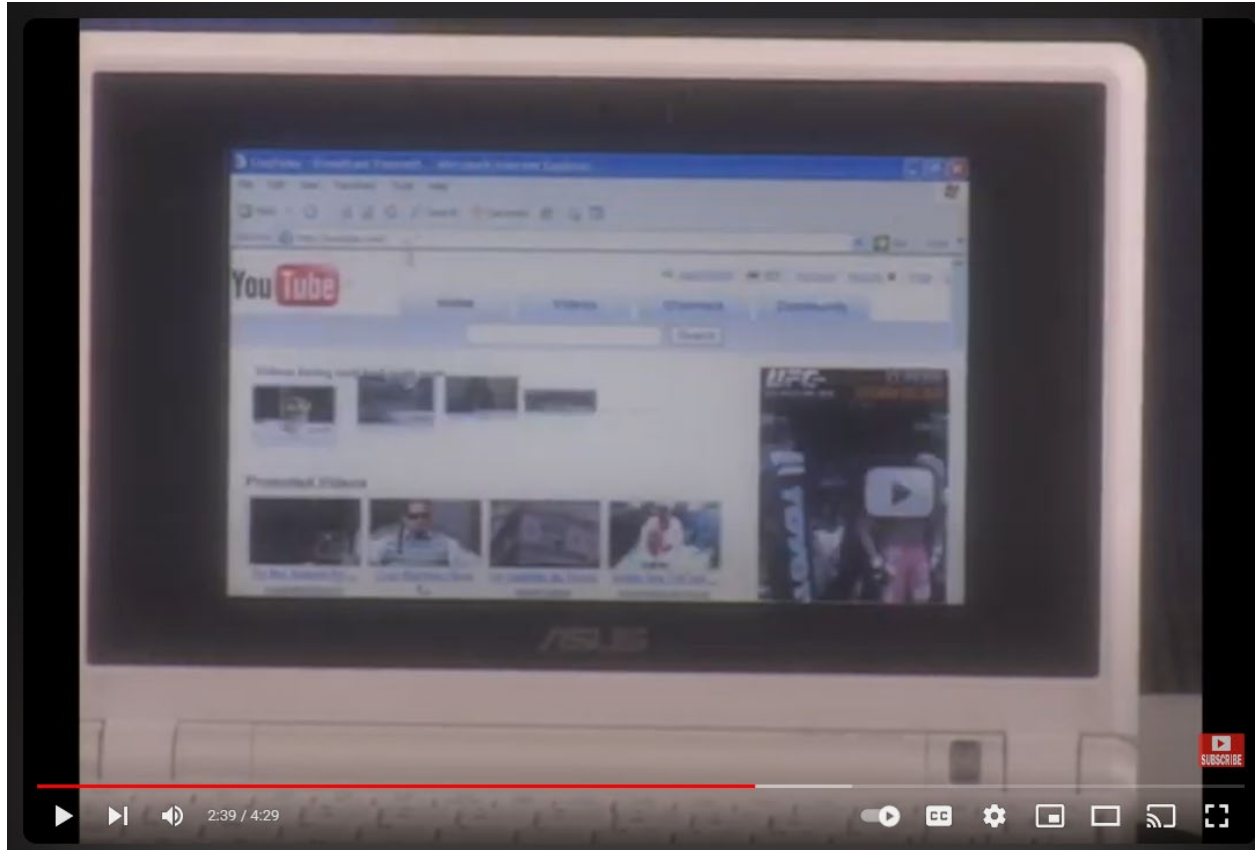
206. It is my opinion that if the Board finds that Purcell does not anticipate the Challenged Claims, then such Challenged Claims (including claims 5 and 8) are rendered obvious by Purcell in view of Yook.

207. Claims 4, 5, and 8 of the '756 patent describe a “visual indicator” on one of the displays to indicate that one of the displays can be maximized. Ex. 1001, claims 4, 5, and 8. As described above, these claims are disclosed by Yook. Both Yook and Purcell describe how a “touch screen” user interface is implemented to receive user gesture inputs.

208. Purcell does not expressly recite the presence of a visual indicator on its displays. Purcell does, however, note that indicate that its system may be implemented with the Windows operating system. Ex. 1007, ¶¶[0003], [0011]. In ¶¶[0003] and [0011], Purcell notes that a user would can execute an ALT-TAB command or use “the Windows Taskbar” to see competing displayed applications.

209. The well-known Windows operating systems from 2007 and earlier (e.g., Windows 95, Windows XP and Windows Vista) all included a Taskbar with various icons and menu options as well as icons at the top of windows that would indicate to a user that a window can be maximized, minimized, or closed. Ex. 1008 (“Common

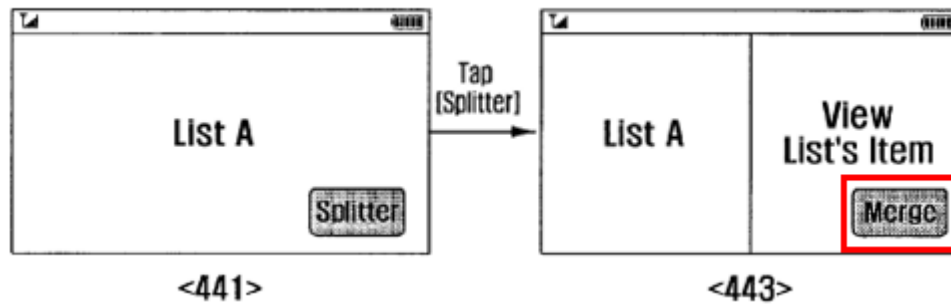
tasks have been consolidated, and simplified, and new visual cues have been added to help users navigate their computer more easily.”).



Ex. 1009. Screenshot of Windows XP operating system from video dated December 28, 2007, displaying Windows Taskbar and icons indicating maximization, minimization, and window closing.

210. Yook specifically provides examples of visual indicators on its displays that indicate to a user that a display can be maximized to be displayed across both the first display and the second display. For example, Yook displays a “merge” button that a user can tap with an input gesture and that will return the split-screen display

back into one application displayed on both the first and second displays. Ex. 1004, Fig. 4e, ¶[0055].

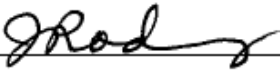


211. To the extent that window maximization is not already present in Purcell's operating system, a POSITA would find Yook's teaching of a visual indicator indicate to maximize a display to be readily applicable and easily implemented in the system of Purcell. Purcell already expressly recognizes that a user can close the second display. Ex. 1007, ¶[0010]. It would therefore be obvious to a POSITA that providing a visual indicator for returning one of the displays in Purcell's system to full screen mode is common sense to implement.

212. As I previously explained in Section XI, claim 5 would also be obvious to a POSITA by combining Purcell and Yook because the shape of the visual indicator is merely a design choice and does not affect the functionality of the element.

OATH

I hereby declare that all of the foregoing statements are true or I believe them to be true to the best of my knowledge, information, and belief. I understand that willful false statements and the like are punishable by fine or imprisonment, or both in accordance with 18 U.S.C. 1001.



Jeffrey J. Rodriguez

Oct. 18, 2024

Date