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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MASIMO CORPORATION,
Petitioner

v.

APPLE INC.,
Patent Owner

Case No. IPR2023-00664
Patent No. 11,106,352

FOURTH DECLARATION OF CRAIG S. ROSENBERG, PH.D.

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I. INTRODUCTION

1. I, Craig S. Rosenberg, Ph.D., am making this declaration at the request of Masimo Corporation (“Petitioner”). I understand that this declaration will be submitted as Exhibit 1064 in support of Petitioner’s Opposition to Patent Owner’s Revised Contingent Motion to Amend.

2. I am being compensated for my work in this matter at my standard hourly rate for consulting services. My compensation in no way depends on the outcome of this proceeding.

3. The opinions set forth in this declaration are my independent opinions, formed after conducting significant analysis, over several days, related to whether Patent Owner’s proposed substitute claims of the ’352 patent would have been obvious in view of the prior art discussed in this declaration.

4. In conducting the analysis and forming the opinions set forth in this declaration, I considered, in addition to my knowledge and expertise in the relevant field, at least the following written materials:

- Petition for Inter Partes Review of the ’352 patent (Paper 1)
- Decision Granting Institution of Inter Partes Review (Paper 8)
- Patent Owner’s Revised Contingent Motion to Amend (Paper 27)
- Dascola (EX1051);
- Tu (EX1065)

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- Gao (EX1066)
- Moto 360 (EX1067)
- Tsukamoto (EX1068)
- Le Grand (EX1069)
- Lee (EX1070)
- Brinda (EX1072)
- '352 patent (EX1001);
- File history of the '352 patent (EX1002);
- Declaration of Craig Rosenberg, Ph.D. (EX1003)
- Chae (EX1005);
- Narendra (EX1006);
- Android 4.2 lock screen widgets (“Android”) (EX1007);
- Shuttleworth (EX1008);
- de Sa (EX1009);
- Hong (EX1010);
- Karunamuni (EX1011);
- Norman (EX1012);
- Nielsen 1 (EX1013);
- Nielsen 2 (EX1014);
- U.S. Patent No. 10,466,889 (EX1018);

- Bandyopadhyay (EX1019);
- The content, including the video and metadata, located at https://www.youtube.com/watch?v=ZpN8Wyu_z6Y;
- The content, including the archived video and metadata, located at https://web.archive.org/web/20121119160047/https://www.youtube.com/watch?v=ZpN8Wyu_z6Y;
- Any other document referenced herein.

5. I understand that Petitioner will cite and rely on significant portions of my testimony and analysis set forth in this declaration in support of its Opposition to Patent Owner's Revised Contingent Motion to Amend. I have not been provided or reviewed the Opposition or any drafts of the Opposition, and, thus, the Opposition or drafts of the Opposition have not influenced my testimony or analysis set forth in this declaration.

II. PROFESSIONAL BACKGROUND AND QUALIFICATIONS

6. My experience and qualifications were summarized in my first declaration submitted in this IPR (EX1003). A detailed record of my professional qualifications, including a list of publications, awards, research grants, and professional activities, is set forth in my curriculum vitae. A list of my previous testimony by deposition and at trial is also included in my curriculum vitae. Exhibit 1004 is a true and correct copy of my curriculum vitae.

III. APPLICABLE LEGAL PRINCIPLES

7. I have been asked to provide my opinion as to whether the substitute claims of the '352 patent would have been obvious to a person of ordinary skill in the art at the time of the alleged invention, in view of the prior art.

8. I am not an expert in patent law. Therefore, the attorneys from Knobbe, Martens, Olson & Bear, LLP have provided me with guidance as to the applicable patent law in this matter. The paragraphs below express my understanding of how I must apply current principles related to patent validity to my analysis.

9. My first and second declarations express my understanding of the principles related to patent validity that I have applied to my analysis.

IV. BACKGROUND OF THE '352 PATENT

A. Technical Field and Level of Ordinary Skill in the Art

10. The '352 patent relates to a touchscreen user interface that uses gestures to navigate between different screens on a smartphone or similar electronic device. The '352 patent states that its technical field “relates generally to electronic devices with touch-sensitive surfaces, including but not limited to electronic devices with touch-sensitive surfaces that include user interfaces for displaying notifications.” EX1001 at 1:16-19. The claims of the '352 patent also recite user-interface functions for touchscreen devices. However, the claims of the '352 patent are not directed specifically to user interfaces for displaying notifications, but instead relate to user

interfaces for navigating among different user-interface screens of touchscreen devices. *See, e.g., id.*, claims 1-24. The specification also describes user interfaces for navigating among different user-interface screens of touchscreen devices. Accordingly, based on the specification and claims of the '352 patent, in my view the art of the invention is user interfaces for navigating among different user-interface screens of touchscreen devices.

11. Based on my education and experience within the art of the invention at the relevant time, a POSITA of the '352 patent would have had at least a bachelor's degree in a discipline related to human-computer interaction, such as Human Factors, Computer Science, Computer Engineering, or an equivalent discipline, and at least two years of experience working with touchscreen user interfaces. More education could substitute for less work experience, and vice-versa.

B. The Alleged Invention

12. The claims of the '352 patent recite navigating between a wake screen, a home screen, a widget screen, and a control panel screen using the familiar swipe gestures that have long been commonly used in touchscreen user interfaces. In my view, the claims do not recite new functionality for wake screens, home screens, widget screens, and control panel screens. A POSITA would have understood that smartphones and other touchscreen devices had wake screens, home screens, widget screens, and control panel screens like those described in the '352 patent years before

the '352 patent. Accordingly, in my view, the patentability of the claims rests on claiming a particular navigation path (i.e., movement from one user-interface screen (e.g., Screen A) to another (e.g., Screen B)) in response to a swipe gesture in a particular direction (e.g., a left-to-right swipe). For example, claim 1 recites navigating from a wake screen to a home screen when the user swipes in one direction and navigating from the wake screen to a widget screen when the user swipes in a different direction. The other claims recite similar navigational paths from one screen to another in response to a swipe gesture.

C. The Revised Substitute Claims

13. The revised Substitute Claims amend some of the original claims by adding user interface functionality that was well-known before the '352 patent. For example, the Substitute Claims recite amended limitations related to well-known “tilt to wake”, navigation animation, and power button functionality related to user interfaces in mobile devices.

V. PRIOR ART BACKGROUND AND SUMMARY

14. I provided a summary of certain relevant prior art references in my first declaration in paragraphs 56-61. Below is a summary of additional prior art references that disclose the amended limitations of the Substitute Claims.

A. Tu

15. U.S. Patent Application Publication No. US 2016/0018872 A1 (Exhibit 1065 or “Tu”) was filed by Apple in 2015 and published on January 21, 2016. Tu discloses methods for detecting “raise gestures” for mobile electronic devices, including based on a change in orientation of the device.

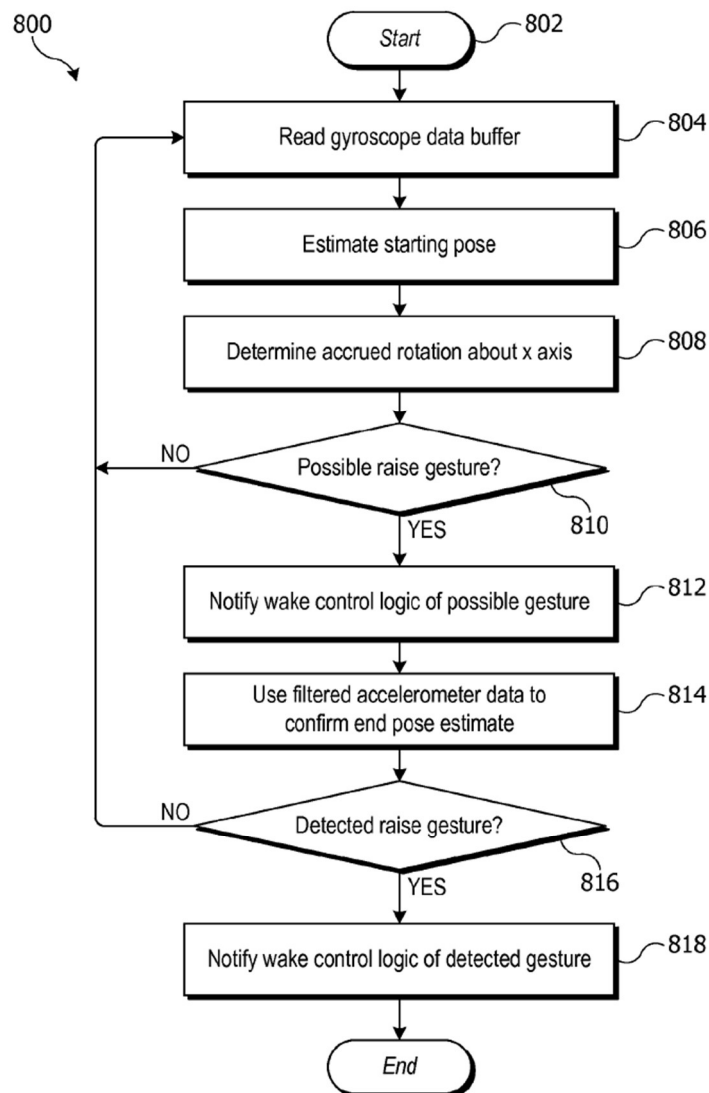


FIG. 8

16. Tu also discloses activating the device’s display in response to a detected raise gesture. Tu ¶33. For example, Tu explains that “wake control logic” can activate the user interface in response to a detected raise gesture. EX1065 ¶72.

B. Gao

17. U.S. Patent No. US 9,966,047 B2 (Exhibit 1066 or “Gao”) was effectively filed by Huawei Technologies Co., Ltd. in 2014 and published on April 14, 2016. In its “Background” section, Gao discloses that prior smartwatches included “tilt-to-wake” functionality based on angle thresholds. EX1066, 1:16-23. For example, smartwatches prior to Gao included functionality as follows: “when the watch is inclined downward relative to a horizontal plane, and an angle of inclination is greater than an angle threshold (for example, 30°), the screen is lit up automatically.” *Id.*

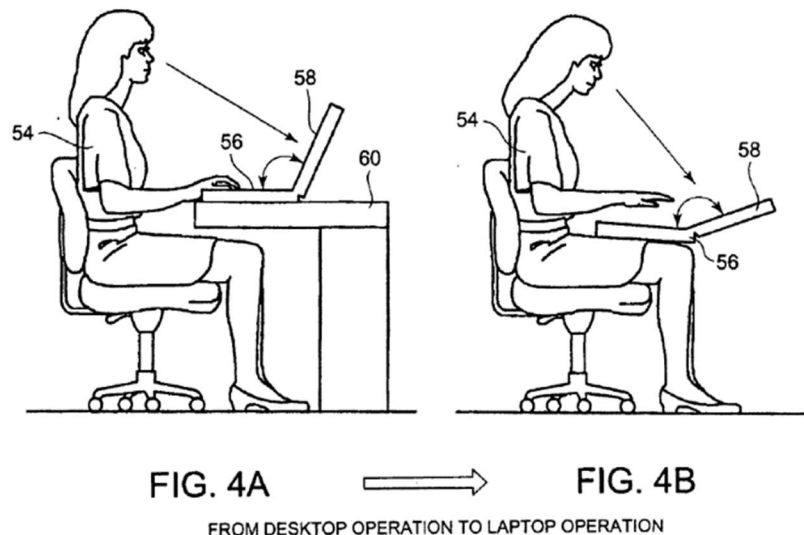
C. Moto 360

18. The 2015 Moto 360 User Manual (Exhibit 1067 or “Moto 360”) was published by 2015. Moto 360 discloses that the Moto 360, a prior smartwatch, included a device setting to “tilt to wake screen,” which would “show the watch screen when you tilt your wrist to look at the watch.” EX1067 at 9. The manual also discloses using the power button to turn off the watch’s screen and disable notifications. *Id.* at 15. The manual is publicly available at <https://en->

us.support.motorola.com/ci/fattach/get/1264666/1434744744/redirect/1/filename/moto-360-68017750001c.pdf.

D. Tsukamoto

19. U.S. Patent Application Publication No. US 2006/0139326 A1 (Exhibit 1068 or “Tsukamoto”) was filed by Lenovo in 2005 and published in 2006. Tsukamoto discloses a laptop computer configured to toggle between different device settings depending on the angle of the laptop lid. EX1068, at Abstract.



E. Le Grand

20. U.S. Patent No. US 9,159,294 B2 (Exhibit 1069 or “Le Grand”) was filed by Google in 2014 and issued in 2015. Le Grand discloses a mobile computing device configured to activate its display when its orientation is changed from horizontal to vertical. EX1069, Fig. 1, 4:28-30.

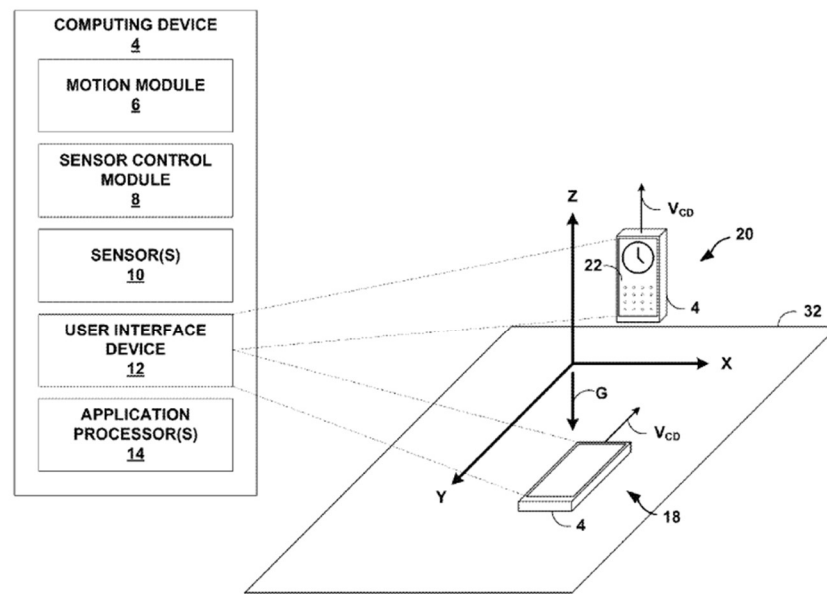


FIG. 1

F. Lee

21. U.S. Patent Application Publication No. US 2012/0272230 A1 (Exhibit 1070 or “Lee”) was filed by Apple in 2011 and published in 2012. Lee discloses a mobile electronic device with a power button, which “may be used to toggle the display screen 2 on and off (i.e. transition the device 1 between wake and sleep states).” EX1070 ¶20.

G. Brinda

22. U.S. Patent No. 8,826,172 (Exhibit 1072 or “Brinda”) was filed by HTC Corporation in 2009 and issued in 2014. Brinda discloses “when the user touches the touch screen moving from a point A to a point B, the electronic device correspondingly moves the protection layer 310 along a direction from point A to

point B to reveal a part of the original layer 320 originally covered by the protection layer 310.” EX1072, 5:34-39; Fig. 3(b).

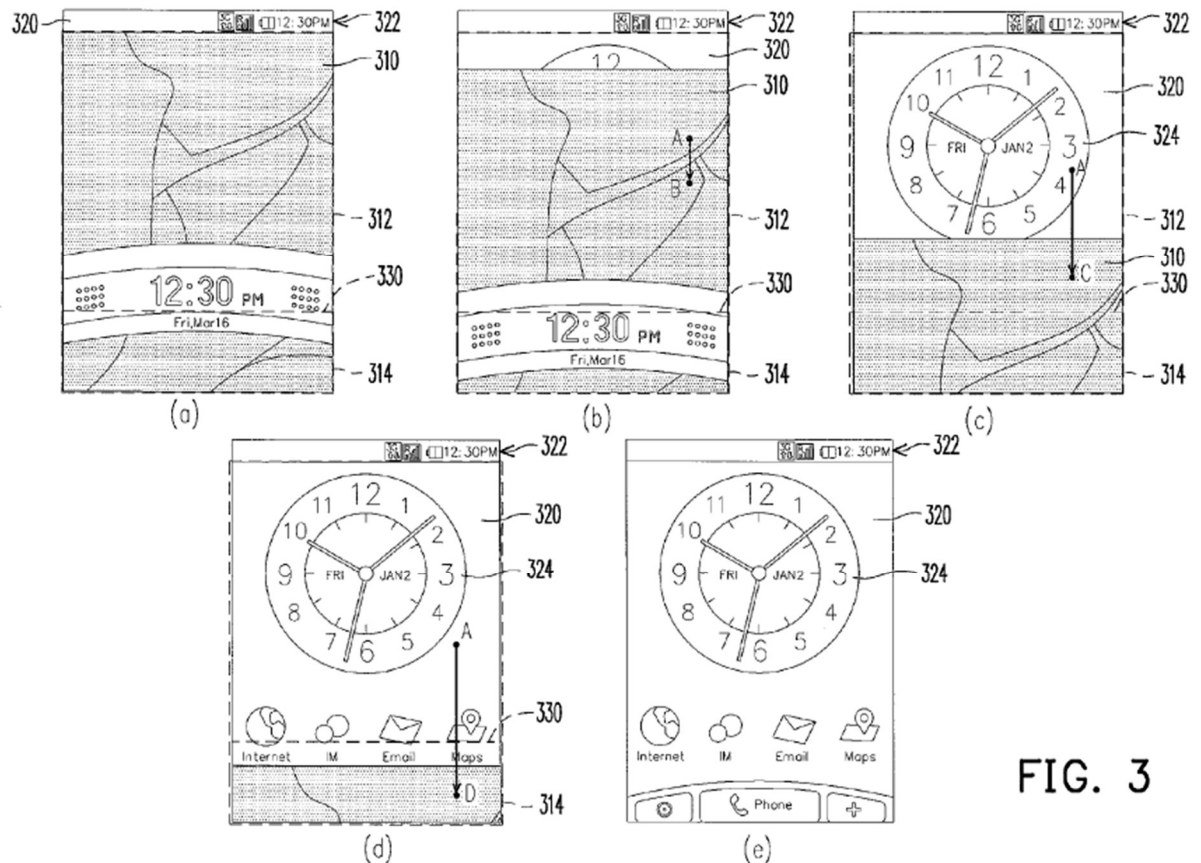
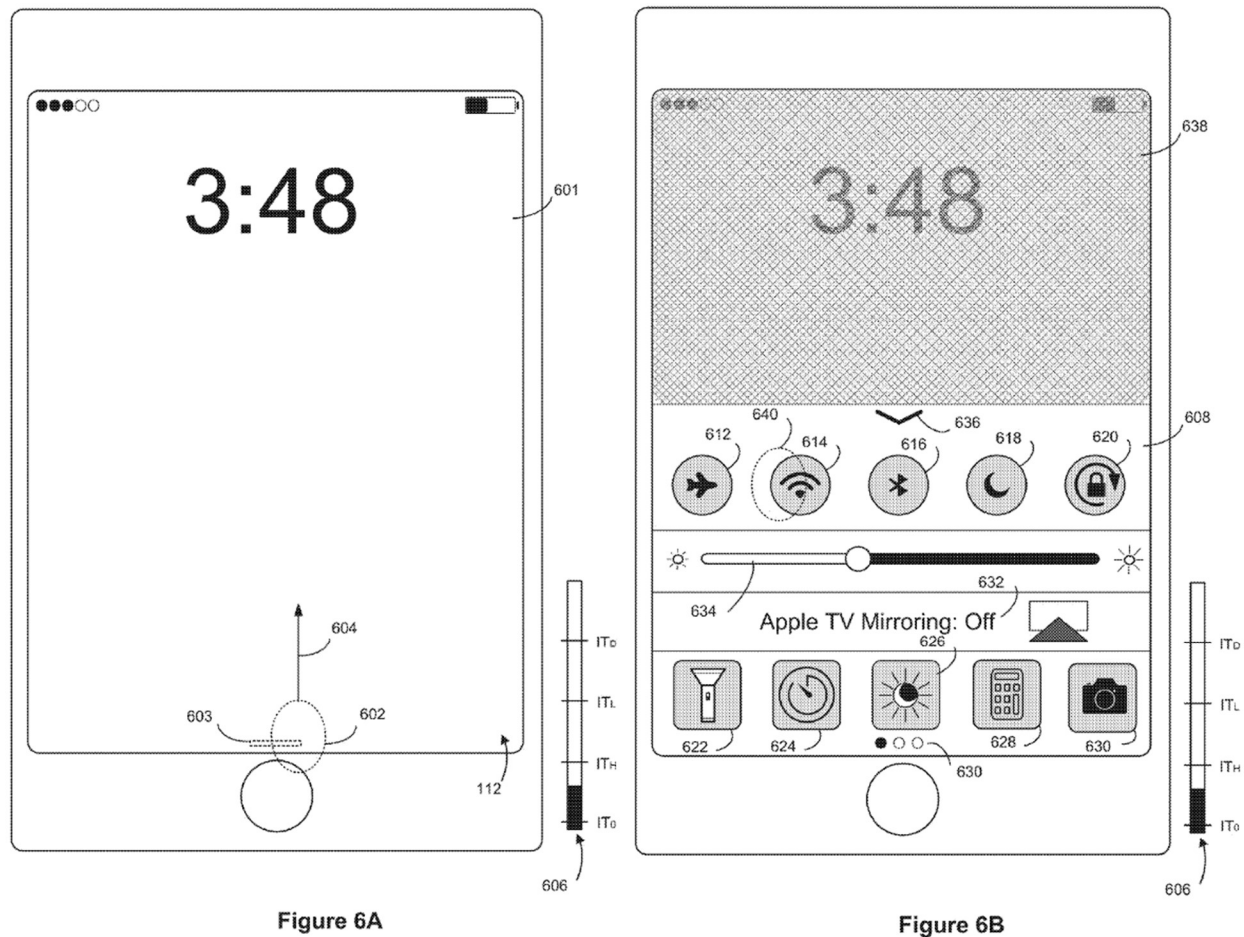


FIG. 3

H. Dascola

23. U.S. Patent Application Publication No. US 2017/0046024 A1 (Exhibit 1051 or “Dascola”) was filed by Apple in 2016 and published on February 16, 2017. Dascola discloses an electronic device with a touch-sensitive surface that detects inputs for manipulating user interfaces, including wake screen, home screen, and widget screen user interfaces. Dascola also discloses using swipe or drag gestures to navigate between screens and specific animations associated with navigating

between screens, such as sliding a wake screen up to gradually reveal an underlying user interface. EX1051, Figs. 6A-D, ¶400.



24. Notably, Dascola includes numerous figures and passages that are identical to figures and passages in the '352 patent. For example, at least Figures 1A-B, 2, 3, and 4A-E in Dascola are identical to the corresponding figures in the '352 patent.

I. Principles of User-Interface Design

25. In addition to the prior art references summarized above, a POSITA would have understood basic principles of user-interface design that were well

known before the effective filing date of the '352 patent. My first declaration explains several of these basic principles in paragraphs 62-70.

J. A POSITA would have been motivated to combine, and would reasonably have expected success in combining, any two or more of Chae, Narendra, Android, Shuttleworth, Hong, Karunamuni, Dascola, Tu, Gao, Moto 360, Le Grand, Brinda, and Lee.

26. Chae, Narendra, Android, Shuttleworth, Hong, Karunamuni, Dascola, Tu, Gao, Moto 360, Le Grand, Brinda, and Lee are all in the same field of touchscreen user interfaces for mobile electronic devices. Further, each of these prior-art references discloses one or more user-interface features that would enhance the ease-of-use and user-friendliness of a touchscreen user interface for a mobile electronic device. A POSITA would have understood that the advantages of the disclosed features are compatible with and additive of each other, such that providing a combination of the disclosed features in a single mobile device user interface would further enhance ease-of-use and user-friendliness beyond providing just one of the disclosed features. Moreover, each of these features would have been easy to implement in software without needing to overcome any technical barriers or the need to make any changes to the hardware configuration of any smartphone. Therefore, a POSITA would have reasonably expected success in combining the features to achieve the additive advantages of the combined features. A POSITA would have understood such a combination to be a simple combination of familiar user-interface features to perform their established functions to achieve the

predictable result of additional ease-of-use and user-friendliness without the need for any undue experimentation.

27. A POSITA would have been motivated to implement user-friendly user interface features into different available hardware platforms. Different users prefer different types of hardware platforms, such as touchscreen tablets, phones, and watches. Thus, implementing features into different types of hardware would make the features accessible to more users. Moreover, a POSITA would have an interest in maintaining continuity of user interface features across multiple different hardware platforms so that users would not have to learn to interact with a completely different interface when switching between different hardware platforms.

28. The general motivation to combine discussed above is applicable to all grounds of unpatentability set forth below. In addition to this general motivation to combine, a POSITA would also have been motivated to combine the prior art for specific reasons set forth in my analysis below.

VI. GROUNDS FOR UNPATENTABILITY

A. Substitute Claims 25-27, 30-32, and 35-37 would have been obvious in view of Chae, Narendra, Shuttleworth, and Tu.

29. In my first declaration, I explained how claims 3-5, 11-13, and 19-21 would have been obvious in view of Chae, Narendra, and Shuttleworth. EX1003,

¶¶128-143. Substitute Claims 25-27, 30-32, and 35-37 amend claims 3-5, 11-13, and 19-21, respectively.

30. Tu discloses each of the amended limitations of Substitute Claims 25-27, 30-32, and 35-37. Thus, if any of claims 3-5, 11-13, and 19-22 are found unpatentable in view of Chae, Narendra, and Shuttleworth, then the corresponding Substitute Claims are likewise unpatentable in view of Chae, Narendra, Shuttleworth, and Tu.

31. Chae, Narendra, and Shuttleworth all teach user interface navigation methods recited in the original claims. For example, each of these references teaches performing specific user interface-related tasks in response to user gestures. Similarly, Tu teaches methods for detecting a specific type of gesture-based on different criteria, such as tilt angle thresholds. A POSITA would have understood that the raise gesture detection techniques taught in Tu are compatible and additive disclosed with the navigation methods taught in Chae, Narendra, and Shuttleworth. Thus, a POSITA would not have encountered significant technical obstacles in implementing multiple known user-interface methods on a single device.

32. A POSITA would have specifically been motivated to implement the “tilt to wake” functionality disclosed by Tu with prior art smartphones to manage the device's power consumption more efficiently and improve ease-of-use. For example, Chae and Android disclose waking up a smartphone in response to an

input, such as a button press. A POSITA would have understood that, in addition to pressing a button, tilting the device would be an alternative way to wake up a device's display. A POSITA would have further understood that implementing "tilt to wake" would enhance power efficiency, because activating the display when a user is moving the device into the user's line of sight would ensure that the display only consumes power when the user is actively looking at it. Activating the display on a tilt would also have been user-friendly by eliminating any need for the user to perform the extra step of pressing a button (or performing some other affirmative input to wake the device).

33. Although Tu focuses on wrist-wearable devices, it also discloses that its raise gestures could be implemented on other devices, such as smartphones as well. For example, Tu discloses:

[T]he algorithms and modules described above can be implemented in other portable devices, such as mobile phones, tablets, or the like, that a user might pick up and hold during interaction with the device. Algorithms and/or modules as described above, when implemented in a handheld device, can detect changes in the orientation of the device consistent with being picked up and held in a user's line of sight . . . and detection of such changes can be used to trigger changes in device state (e.g., activating a display or other user interface component, waking a processor from a sleep state, etc.).

EX1065 ¶192. Accordingly, a POSITA would have understood that the “tilt to wake” algorithms disclosed in Tu could have been implemented into prior art smartphones, such as those disclosed in Chae and other prior art cited in the Petition.

1. Substitute Claims 25, 30, and 35

34. Substitute Claims 25, 30, and 35 amend claims 3, 11, and 19, respectively. These Substitute Claims amend the original claims by adding:

“wherein:

detecting the input that meets the display-waking criteria comprises:

determining, using one or more sensors, whether a change in an orientation of the computer system satisfies a tilt angle threshold; and

in response to determining that the change in the orientation of the computer system satisfies the tilt angle threshold by determining that the computer system is tilted at an angle that is greater than the tilt angle threshold:

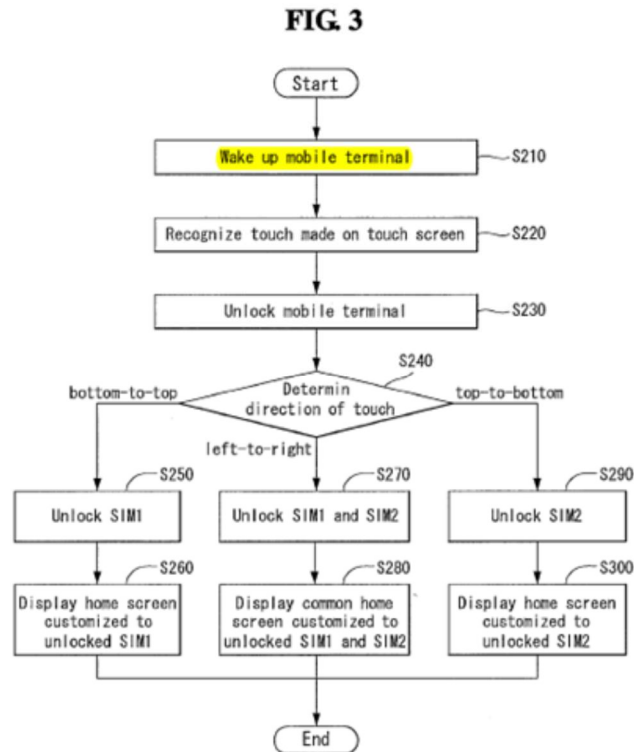
transitioning the computer system from a screen-off state to a screen-on state; and

displaying, via the display generation component, the display wake screen user interface.”

35. As explained below, Tu discloses each of these amended limitations.

a. “detecting the input that meets the display-waking criteria”

36. As explained in my previous declarations, Chae discloses detecting an input that meets display-waking criteria. E.g., EX1054, ¶83. Figure 3 of Chae illustrates a step S210 in which the mobile terminal wakes up:



EX1005, Fig. 3 (annotated). The specification indicates that, because “steps S210 to S230 of FIG. 3 are identical to the steps S110 to S130, the detailed descriptions thereof are omitted herein.” *Id.* ¶102. Accordingly, a POSITA would have understood that the specification’s descriptions of steps S110 to S130 (which are illustrated in Figure 2) also describe the identical steps S210 to S230 of Figure 3.

With respect to step S110 (identical to step S210), the specification teaches:

At step S110, the controller 180 of the mobile terminal 100 wakes up the mobile terminal 100 in response to a control signal that is generated based on a user’s action such as clicking a button (not shown).

Id. ¶94.

37. Tu also discloses detecting an input that meets display-waking criteria. Tu is directed to methods for detecting a “raise gesture.” EX1065 ¶8. A POSITA would have understood that such a raise gesture is an input. Tu also teaches that “[i]n response to detecting such a [raise] gesture, the device can activate its display and/or other components.” *Id.* Accordingly, a POSITA would have understood that since detection of the “raise gesture” causes the device to activate its display, the “raise gesture” is an “input that meets the display-waking criteria.”

b. “determining, using one or more sensors, whether a change in an orientation of the computer system satisfies a tilt angle threshold”

38. Tu discloses “determining, using one or more sensors, whether a change in an orientation of the computer system satisfies a tilt angle threshold.” For example, Tu discloses detecting a possible “raise gesture” based on a change in orientation of the device:

For instance, if the starting pose is arm-down (e.g., as shown in FIG.

1A), a raise gesture would be expected to involve lifting the forearm and rotating the wrist, both of which can be detected primarily by

reference to changes in a_x and a_y .

EX1065 ¶66 (emphasis added). A POSITA would understand the above reference to “ a_x and a_y ” to mean an angle of tilt (or “orientation”) of the device in the x and y axes, respectively. *See id.* Fig. 3.

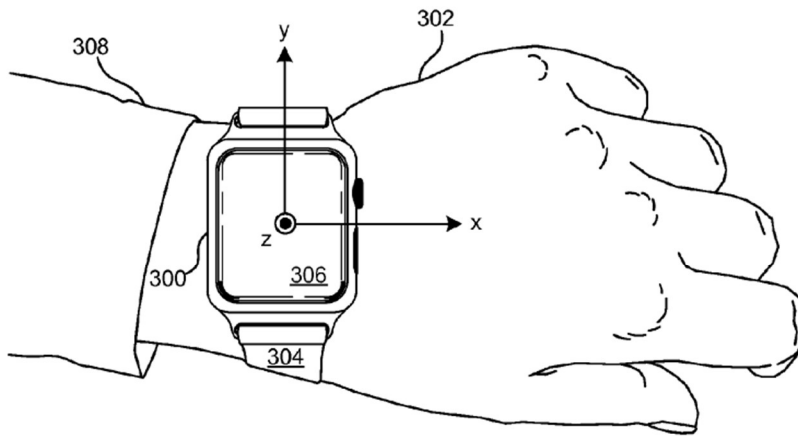


FIG. 3

39. Tu also discloses detecting a change in orientation. For example, the following passage describes a change in a_y :

[T]he transition from a starting pose to a focus pose can involve accruing a certain amount of tilt along the y axis (also referred to herein as ‘y-tilt’). For instance, accrued y-tilt can be measured as a net change from a starting a_y component that is greater than equal to zero . . . to an ending a_y component that is less than zero.

EX1065 ¶70. A POSITA would have understood from the above passage that “accruing a certain amount of tilt along the y axis” means comparing the change in orientation of a_y to a certain threshold. Moreover, Tu also explicitly discloses comparing this change in orientation with a tilt angle threshold:

Statistical algorithms can be applied to analyze this data in order to identify particular criteria (e.g., thresholds on change in a smoothness

of motion, etc.) for recognizing a possible raise gesture performed from that particular starting pose.

Id. ¶66. A POSITA would have recognized that such a threshold would constitute a “tilt angle threshold.”

40. Finally, a POSITA would have understood that the detection would be performed by one or more sensors. For example, Tu discloses using a motion sensor, such as an accelerometer and/or gyroscopic sensor, to detect a change in orientation.

Id. ¶61.

- c. **“in response to determining that the change in the orientation of the computer system satisfies the tilt angle threshold by determining that the computer system is tilted at an angle that is greater than the tilt angle threshold”**

41. Tu discloses this limitation: “For instance, the transition from a starting pose to a focus pose can involve accruing a certain amount of tilt along the y axis.”

EX1065 ¶70. Moreover, Figure 13 of Tu illustrates determining whether a tilt angle is greater than a threshold. Regarding Figure 13, Tu states that “[i]f, at block 1310, a sufficiently large change in tilt has been detected, then at block 1312, process 1300 can notify wake control logic 230 that a loss-of focus event has been detected.” *Id.* ¶134.

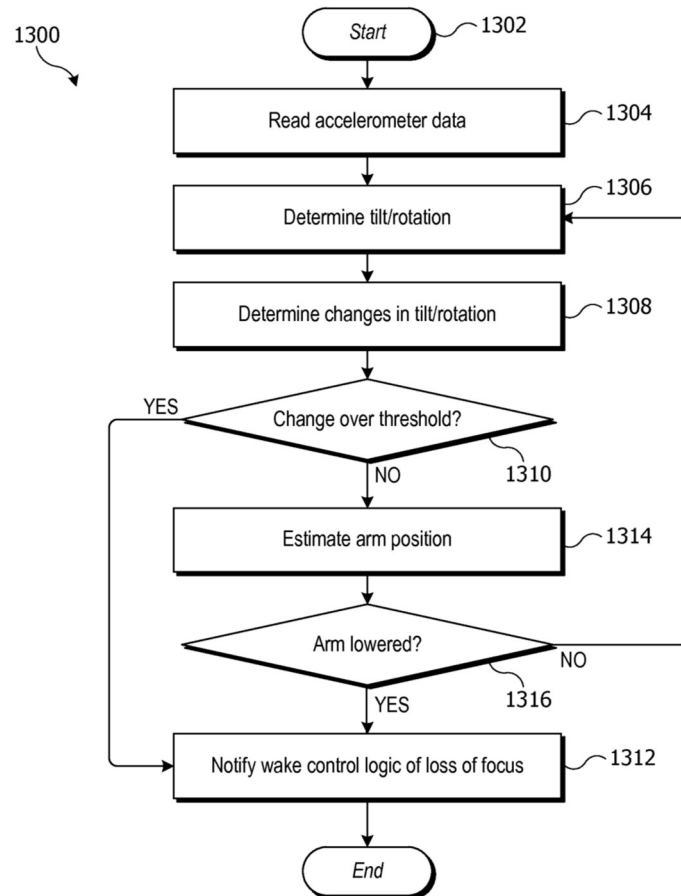


FIG. 13

42. Figure 13 illustrates a method for detecting a “loss-of-focus event,” which would result in inactivating the display, rather than activating the display as recited in Substitute Claims 25, 30, and 35. However, a POSITA would have understood that since detecting loss of focus is a similar but opposite process versus detecting a raise gesture, the method of Figure 13 could readily be adapted to detect a raise gesture for activating the display as well. Such an adaptation would simply require a programmer to modify the method so that the threshold to be satisfied when

the tilt is changed in the opposite rotational direction (i.e., by reversing the tilt angle threshold).

43. A POSITA would have understood that determining that a change in orientation satisfies the tilt angle threshold would necessarily involve determining that the system is tilted at an angle that is greater than the threshold.

d. “transitioning the computer system from a screen-off state to a screen-on state”

44. Tu discloses this limitation: “In response to detecting such a gesture, the device can activate its display.” EX1065 ¶8. Specifically, Tu discloses that in response to detecting a raise gesture, the device may notify “wake control logic,” which in turn notifies other device components to perform some action. *Id.* ¶69. One such action is activating a user interface. *Id.* ¶672 (“[P]rocess 400 can notify wake control logic 230 that a detected raise gesture has occurred. As described below, wake control logic 230 can take action in response to this notification, such as activating user interface 202.”); *see also id.* Fig.8, ¶¶ 8, 38. A POSITA would have understood that activating the display would necessarily require “transitioning the computer system from a screen-off state to a screen-on state.”

e. “displaying, via the display generation component, the display wake screen user interface”

45. As explained in my first declaration, Chae discloses displaying a wake screen user interface in response to detecting the input that meets display-waking

criteria. EX1003 ¶79. Dascola also discloses that a “wake screen user interface 5002 [] is displayed when device 100 is activated from a screen-off state (e.g., a sleep state) to a screen-on state (e.g., a wake state).” EX1051 ¶242. Thus, a POSITA would have understood that in response to detecting the input meeting display-waking criteria (such as a change in orientation satisfying a tilt angle threshold), the device would display a wake screen user interface.

46. Tu does not explicitly disclose displaying a “wake screen user interface.” However, Tu repeatedly references “wake control logic,” which can perform actions such as activating a device’s display. *E.g.*, EX1065 ¶¶ 12, 672. A POSITA would have understood, in light of the disclosure of wake screens in Chae and Dascola, that upon activation of the device’s display, the device would display a wake screen user interface.

f. Other background prior art confirms that “tilt to wake” was not novel

47. Additionally, Gao and Moto 360 confirm that waking a device by tilting the device was well-known before the ’352 patent. Gao discloses in its “Background” section that mobile devices used tilt angle thresholds to activate a screen display:

Currently, some smartwatches in the industry have a function: with a slight rotation of an arm, a screen of a watch is lit up automatically, and time is display [*sic*] on the screen. A principle of the function is as follows: a gravity sensor detects a status of the watch in real time, and

when the watch is inclined downward relative to a horizontal plane, and an angle of inclination is greater than an angle threshold (for example, 30°), the screen is lit up automatically.

EX1066, 1:16-23.

48. The 2015 Moto 360 User Manual also describes a “tilt to wake screen” device setting, confirming that “tilt to wake” functionality was commercially available before the ’352 patent. EX1067, at 9.

2. Substitute Claims 26, 31, and 36

49. Substitute Claims 26, 31, and 36 add the limitation: “wherein determining whether the change in the orientation of the computer system satisfies the tilt angle threshold comprises determining whether the computer system is tilted from a position in which the computer system is substantially horizontal to a position in which the computer system is substantially vertical.”

50. As I explain below, this amended limitation is indefinite because a POSITA would not have understood, with reasonable certainty, whether a specific orientation of the device is “substantially” horizontal or vertical within the context of these claims. However, if the Board is able to construe this limitation, I have assessed the patentability of the claim in view of Tu and Le Grand under multiple possible constructions. *Infra* ¶¶51, 53. As explained below, under any reasonable construction, this limitation is disclosed by the prior art.

51. Tu discloses that “different criteria [for detecting a raise gesture] can be defined for different starting poses.” EX1065 ¶66; *see also id.* ¶60 (“The orientation can be defined relative to an assumed vertical axis of gravity. Based on the starting pose, the algorithm can determine the amount and/or direction(s) of motion that would likely occur to bring the device's display into the user's line of sight.”). Figures 1C and 1D of Tu illustrate one example scenario of a detected raise gesture:

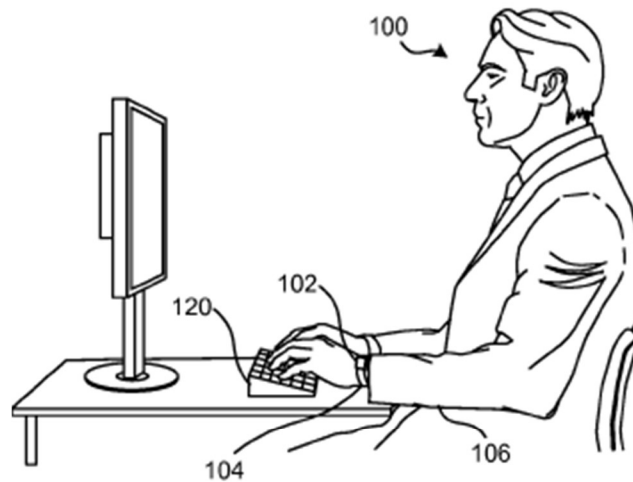


FIG. 1C

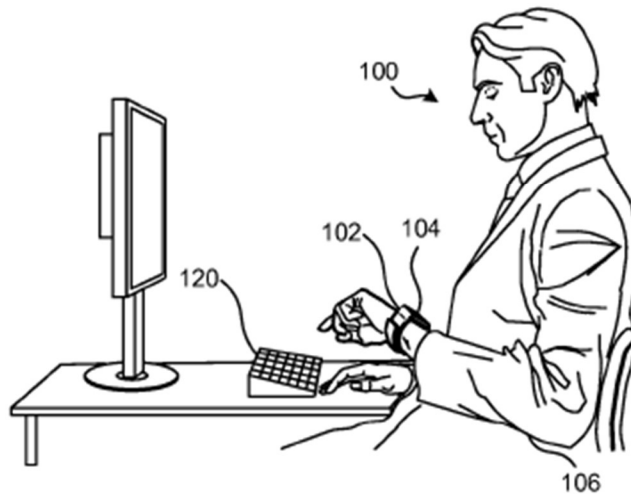


FIG. 1D

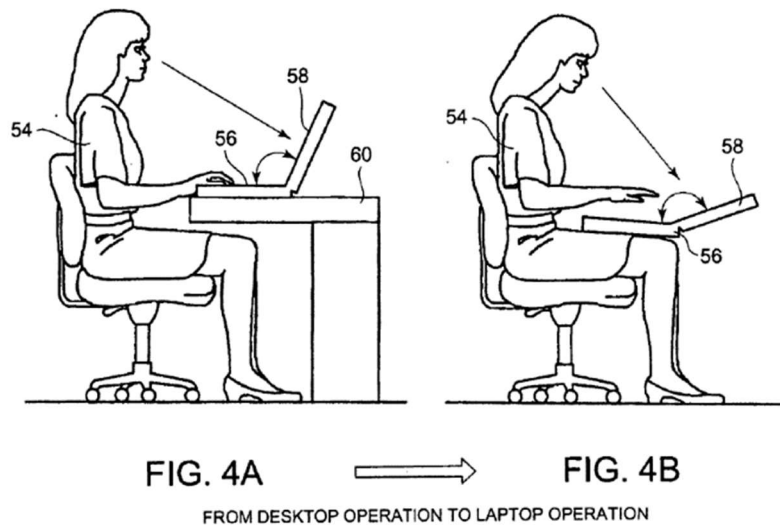
EX1065 Figs. 1C-D. As shown above, in Figure 1C, a user is typing on a computer and the device is “substantially horizontal.” Tu Fig. 1C. Tu discloses that the forearm of the user in Figure 1C is “approximately parallel to the ground.” *Id.* ¶37.

A POSITA would have understood parallel to the ground, along with Figure 1C, to disclose “substantially horizontal.”

52. In Figure 1D, the user tilts the device such that its position is more vertical. EX1065 Fig. 1D. This figure at least suggests a tilt angle of greater than 45 degrees. Thus, Tu discloses the “substantially vertical” limitation under a construction that covers a tilt angle from 45 degrees to 90 degrees from horizontal.

53. Additionally, Tu discloses that “upon completion of the gesture, the device will come to rest in an orientation consistent with its display being in the user's line of sight.” *Id.* ¶67. Tu explains that the term “in the line of sight” refers to “the orientation of the user's head relative to the device.” *Id.* ¶192. A POSITA would have understood that if the user 100 shown in Figure 1D were looking straight ahead at the computer monitor, bringing the device into the user’s line of sight would involve raising the arm so that the device is directly in front of the user’s face and thus substantially vertical.

54. To illustrate, Figures 4A and 4B of Tsukamoto show that a screen is positioned substantially vertically when the user is looking ahead and substantially horizontal when the user is looking down. EX1068, Figs. 4A-B. Thus, under a construction of substantially vertical that requires the device to be close to 90 degrees, Tu would have rendered the limitation obvious.



55. Alternatively, Tu in combination with Le Grand discloses this limitation. Like Tu, Le Grand also discloses activating a device's display when its orientation is changed from horizontal to vertical. EX1069, Fig. 1, 4:28-30 ("FIG. 1 is a block diagram illustrating an example computing device that is configured to activate its display responsive to determining that a user is attempting to use the device.").

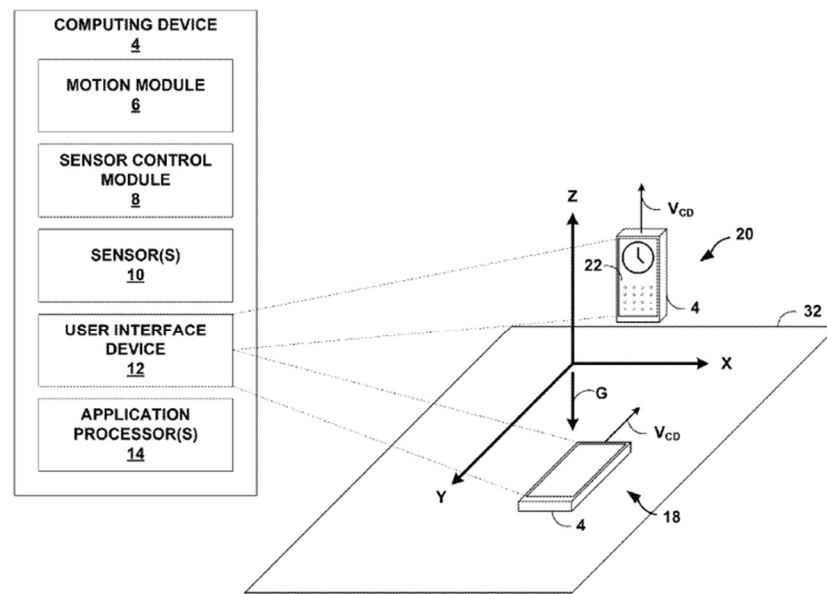


FIG. 1

56. Regarding Figure 1, Le Grand states that “the user may move computing device 4 from a first (e.g., orientation 18) to a second orientation (e.g., orientation 20). *Id.* 6:62-64. As shown in Figure 1 above, orientation 18 is horizontal and orientation 20 is vertical. “In response to determining that computing device 4 has moved from the first orientation to the second orientation, motion module 6 may output a signal,” which causes the device to “transition from a low-power state to a higher-power state.” *Id.* 7:7-15. Finally, Le Grand discloses that “in practice, the orientation of computing device 44 may not be exactly or nearly exactly vertical or horizontal as represented by vector, VCD, in orientations 18 and 20 in FIG. 1,” but rather “approximately vertical or horizontal.” *Id.* 6:21-36.

57. Accordingly, a POSITA would have understood from Tu and/or Le Grand that one use case of “tilt to wake” functionality would be when the device’s

orientation is changed from a position in which the device is tilted from a “substantially horizontal” position to a “substantially vertical” position. *See* EX1065 ¶192 (“The present disclosure uses terms such as ‘approximately’ and ‘substantially’ to qualify certain measurements Other terms such as horizontal, vertical, and parallel may be similarly qualified, to indicate that physical perfection is unnecessary.”). A POSITA would further have understood that the specific starting and ending orientations for meeting a display-waking criteria would be a matter of choosing between a finite number of design options (e.g., anywhere between 0 and 90 degrees) based on use cases of the device. For example, a POSITA designing a laptop may wish to design the laptop such that the display is activated when the laptop lid is rotated from a substantially horizontal position (when the lid is closed) to a substantially vertical position (when the lid is perpendicular to the keyboard).

58. Thus, under any reasonable construction, a POSITA would have found it obvious to determine whether the change in the orientation of the computer system satisfies the tilt angle threshold by determining whether the computer system is tilted from a position in which the computer system is substantially horizontal to a position in which the computer system is substantially vertical.

3. Substitute Claims 27, 32, and 37

59. Substitute Claims 27, 32, and 37 add the limitation: “in response to determining that the change in the orientation of the computer system does not satisfy the tilt angle threshold, controlling the display generation component to not be activated.”

60. Tu discloses that “[i]f a possible raise gesture is not detected, process 400 can return to block 404 to read additional accelerometer data.” EX1065 ¶¶68. Thus, a POSITA would have understood that when the tilt angle threshold is not satisfied, the display generation component would not be activated.

B. Substitute Claims 28, 33, and 38 are unpatentable because they would have been obvious in view of Chae, Narendra, Karunamuni, and Dascola.

61. In my first declaration, I explained how claims 7, 15, and 23 would have been obvious in view of Chae, Narendra, and Karunamuni. EX1003, ¶¶144-152. Substitute Claims 28, 33, and 38 amend claims 7, 15, and 23, respectively.

62. Dascola discloses each of the amended limitations of Substitute Claims 28, 33, and 38. Thus, if any of claims 7, 15, and 23 are found unpatentable in view of Chae, Narendra, and Karunamuni, then the corresponding Substitute Claims are likewise unpatentable in view of Chae, Narendra, Karunamuni, and Dascola.

1. **“while displaying the wake screen user interface, detecting a second input on the wake screen user interface along a longitudinal direction of the computer system”**

63. Dascola discloses “while displaying the wake screen user interface, detecting a second input on the wake screen user interface along a longitudinal direction of the computer system.” For example, Figure 6A of Dascola illustrates detecting a longitudinal drag input on a wake screen:

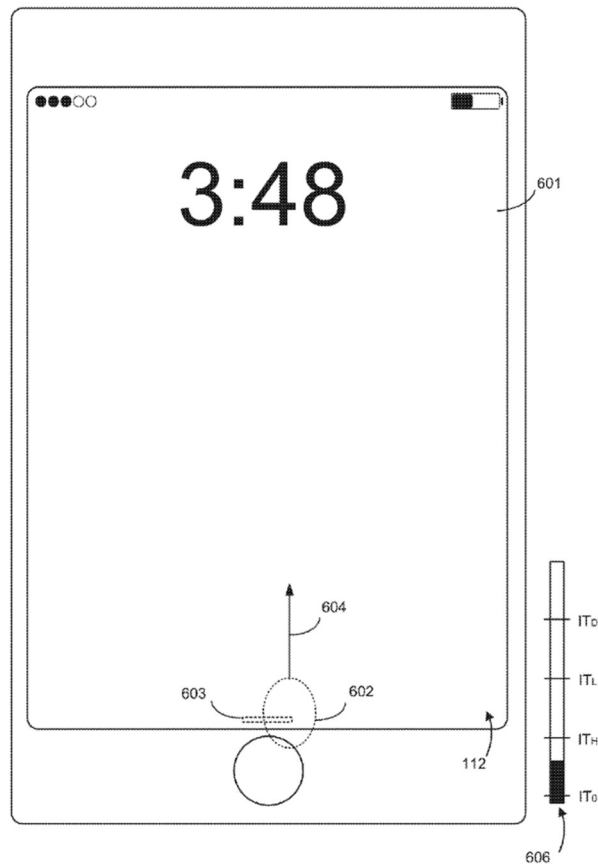


Figure 6A

64. Dascola further explains that:

FIG. 6A illustrates an initial user interface 601 (e.g., a lock screen and/or *wake screen*) at which an input to display a control user interface

that includes a plurality of control affordances is detected, in accordance with some embodiments. In some embodiments, the control user interface is revealed *in response to an input gesture, such as a drag gesture (e.g., a drag gesture that begins at or near an edge of display 100, such as the lower edge of display 100)*. For example, a contact with touch-sensitive surface 112 is detected at a location indicated by focus selector 602. In some embodiments, an affordance 603 is displayed at or near the edge of the display 100 (e.g., to provide a cue indicating that input received at or near the edge of the display 100 will reveal a control user interface 608). *The contact moves along a path indicated by arrow 604.*

EX1051 ¶400 (emphasis added). As shown in Figure 6A above, the drag gesture is “along a longitudinal direction,” as indicated by arrow 604.

2. **“in response to detecting the second input, sliding the wake screen user interface in the longitudinal direction from a lower edge of the display generation component” and “displaying, by the display generation component, an underlying user interface that was covered by the wake screen user interface”**

65. Dascola discloses or makes obvious these limitations. Figures 6B-6D of Dascola illustrate the wake screen sliding upwards from a lower edge of the screen to gradually reveal an underlying user interface.

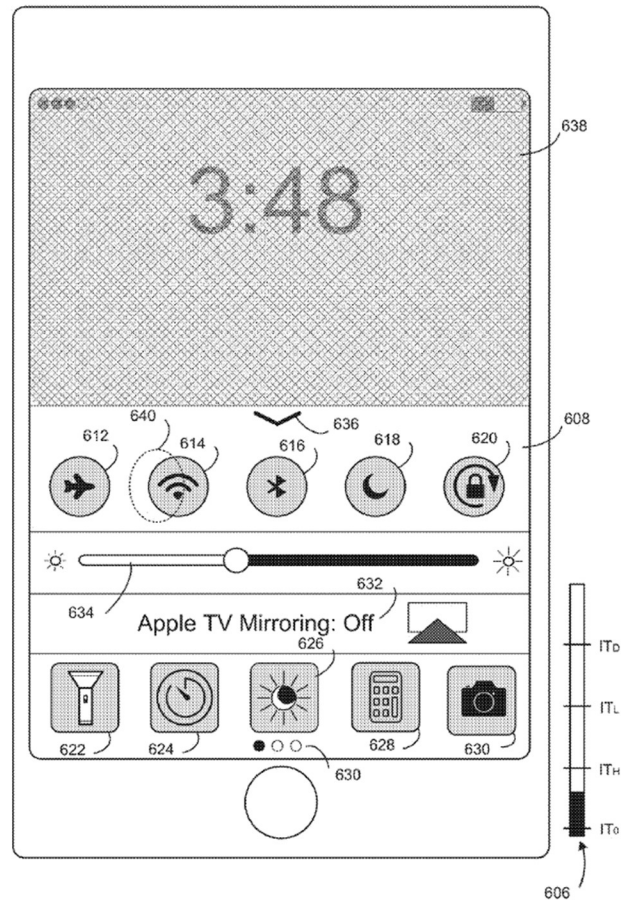


Figure 6B

EX1051, Fig. 6B. Thus, a POSITA would have understood from Figures 6A-6D that in response to the drag gesture illustrated in Fig. 6A, the wake screen slides in the longitudinal direction from the lower edge of the display generation component.

66. Moreover, Dascola discloses that in response to the gesture, “control user interface 608 is gradually revealed as the contact moves along the path indicated by arrow 604.” EX1051 ¶400. This is illustrated in Figure 6B above. As shown, as the wake screen user interface slides up, the underlying control user interface is gradually revealed. Gradually revealing the underlying user interface in this manner

creates the impression that the underlying control user interface was “covered by the wake screen user interface.”

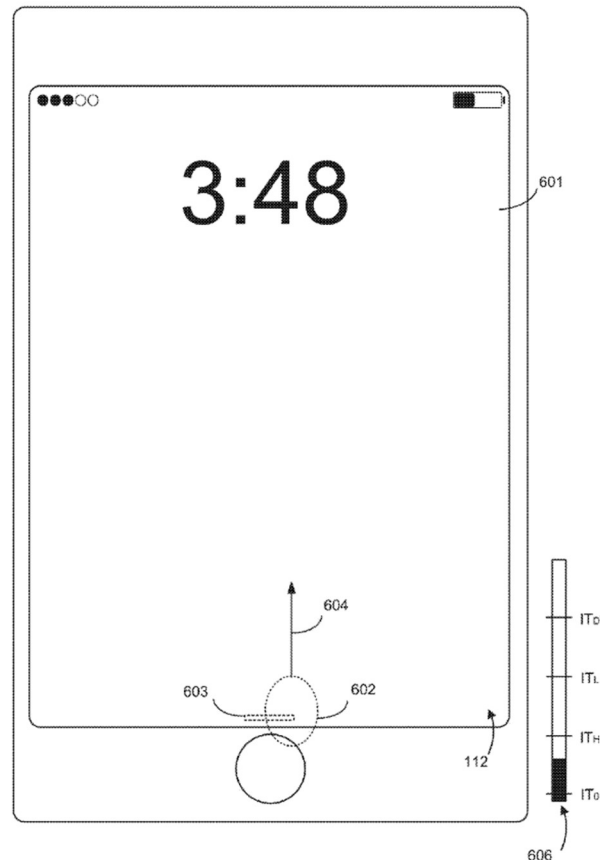


Figure 6A

67. To the extent Dascola is interpreted as sliding the underlying user interface rather than the covering wake screen, it would have been obvious in view of Brinda to instead slide the covering wake screen to reveal the underlying user interface. Specifically, Brinda discloses that “[r]eferring to FIG. 3(b), when the user touches the touch screen moving from a point A to a point B, the electronic device correspondingly moves the protection layer 310 along a direction from point A to

point B to reveal a part of the original layer 320 originally covered by the protection layer 310.” EX1072, 5:34-39; Fig. 3(b).

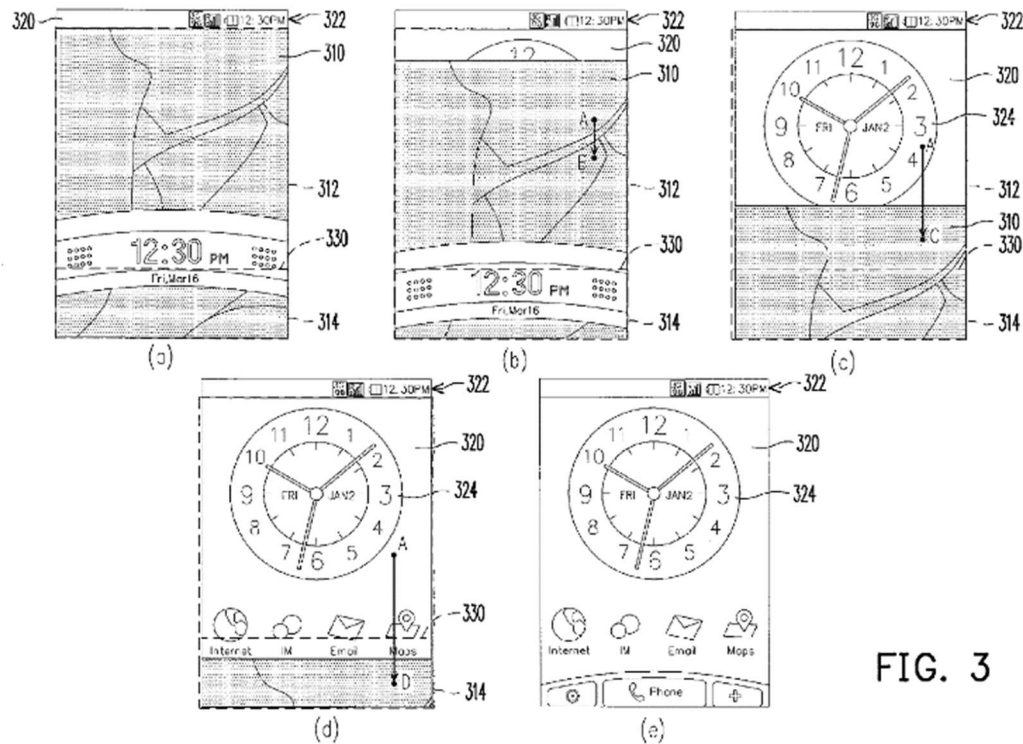


FIG. 3

EX1072, Fig. 3. Figure 3 illustrates “a method for unlocking a screen-locked state of a touch screen.” EX1072, 5:14-16. “FIG. 3(a) illustrates a screen image of the electronic device while the touch screen is in the screen-locked state, wherein a protection layer 310 covers an original layer 320.” Thus, a POSITA would understand that protection layer 310 is a form of a lock or wake screen. Thus, Figure 3 of Brinda illustrates that in response to a longitudinal (top-to-bottom) input, sliding the wake screen in the longitudinal direction and displaying an underlying user interface (original layer 320) that was covered by the wake screen.

68. Thus, these limitations are disclosed or rendered obvious by Dascola, alone or in combination with Brinda.

69. A POSITA would have understood the term “underlying user interface that was covered by the wake screen user interface” is not meant to be interpreted literally since a touchscreen user interface is not three-dimensional. However, programmers and UI designers routinely design user interfaces to *appear* three-dimensional, such as by overlaying user interface windows. See EX1051 ¶401 (“In some embodiments, control user interface is displayed partially or fully overlaying another user interface . . . at which input to display the control user interface is detected....”). Common examples include application windows on personal computers, which typically can be dragged and dropped over one another to create the impression that one window is “covered by” another.

70. Accordingly, a POSITA would have understood the term to mean that the underlying user interface is gradually revealed as the wake screen user interface slides up, thereby creating the impression, to a user, that the underlying user interface was “covered” by the wake screen. Thus, a POSITA would have understood that, as shown in Dascola and Brinda, gradually revealing the underlying user interface creates the impression that the underlying user interface was “covered by the wake screen user interface.”

71. A POSITA would have been motivated to implement the sliding wake screen transition disclosed by Dascola and Brinda with prior art devices in order to improve the overall aesthetics and visual presentation of a user interface. For example, Chae’s mobile terminal already included a bottom-to-top (or “longitudinal”) input on a wake screen to display another screen. Chae, Fig. 3. Thus, a POSITA seeking to improve the visual presentation of the device would have been motivated to animate the transition between the screens, such as by sliding the wake screen up to gradually reveal the other screen as disclosed by Dascola and Brinda. A POSITA would have understood that making such a change would have been trivial.

72. Further, a POSITA would have understood that the concept of layered windows to create a “three-dimensional” user interface was familiar and popular before the ’352 patent. For example, virtually all computers allow users to drag application windows on top of each other, which creates the visual impression that one window “covers” the other.

C. Substitute Claims 29, 34, and 39 are unpatentable because they would have been obvious in view of Chae, Narendra, Karunamuni, Lee and Dascola.

73. In my first declaration, I explained how claims 8, 16, and 24 would have been obvious in view of Chae, Narendra, and Karunamuni. EX1003, ¶¶144-152. Substitute Claims 29, 34, and 39 amend claims 8, 16, and 24, respectively.

74. Lee and Dascola disclose each of the amended limitations of Substitute Claims 29, 34, and 39. Thus, if any of claims 8, 16, and 24 are found unpatentable in view of Chae, Narendra, and Karunamuni, then the corresponding Substitute Claims are likewise unpatentable in view of Chae, Narendra, Karunamuni, Lee, and Dascola.

1. **“while displaying the wake screen user interface and while two or more notifications remains displayed on the wake screen user interface”**

75. Dascola discloses a wake screen user interface with two or more notifications displayed on the wake screen. Figure 5A1 illustrates a wake screen user interface 5002 displaying a number of notifications:

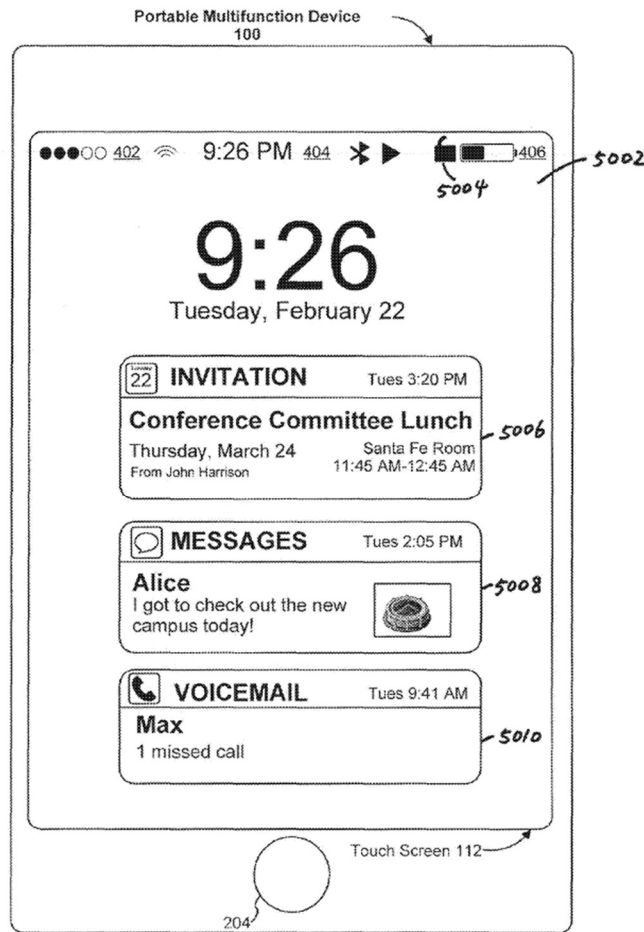


Figure 5A1

EX1051, Fig. 5A1. Specifically, Dascola discloses that:

FIG. 5A1 illustrates wake screen user interface 5002 that is displayed when device 100 is activated from a screen-off state (e.g., a sleep state) to a screen-on state (e.g., a wake state) in an unlocked mode (e.g., as indicated by the “unlocked” indicator 5004). A number of notifications (e.g., notification 5006 for a calendar invitation, notification 5008 for a new instant message, and notification 5010 for a voicemail message) are displayed on the wake screen user interface 5002. Each notification

includes notification content (e.g., an excerpt from a communication, a summary of an event or communication, etc.) and identifying information that identifies a respective application that corresponds to the notification.

Id. ¶242.

76. A POSITA would have been motivated to implement the notifications on a wake screen disclosed by Dascola with prior art devices in order to give users easier access to such notifications. Since the wake screen is the first screen to appear when the display is first activated, a POSITA would have understood that displaying notifications on the wake screen would ensure that users immediately see the notifications, thereby improving the user experience.

2. **“detect a third input, at a power button of the computer system, for dismissing the wake screen user interface” and “in response to detecting the third input for dismissing the wake screen user interface, cease to display both the wake screen user interface and the two or more notifications”**

77. Power buttons were a ubiquitous feature of mobile devices long before the '352 patent. Dascola discloses a “push button 206 for powering the device on/off and locking the device.” EX1051 ¶192. In addition, Lee discloses a mobile device with a power button. Lee discloses that “[t]he power button 6 may be used to toggle the display screen 2 on and off (i.e. transition the device 1 between wake and sleep

states).” EX1070 ¶20. Thus, Lee discloses an input at a power button for shutting off a device’s display.

78. A POSITA would have understood that turning off the display using a power button would necessarily dismiss the wake screen user interface and cause the device to “cease to display both the wake screen user interface and the two or more notifications.” This is consistent with the ’352 patent specification, which discloses that “a second input for dismissing the wake screen user interface” includes “an input (e.g., on a power button) to shut off the display.” EX1001, 56:6-15.

79. Moreover, Lee explicitly discloses ceasing to display a “lock screen and associated widget” upon detecting an input at a power button: “The device may enter the sleep state by pressing the power button for a short duration as explained above. Since the device 1 is in a sleep state, the lock screen and associated widget is not viewable on the display screen 2.” Lee ¶41. A POSITA would understand that the “lock screen” described in Lee is a wake screen user interface. *Compare* EX1001, Fig. 5B (illustrating wake screen user interface 504) *with* EX1070, Fig. 5A (illustrating a “lock screen”).

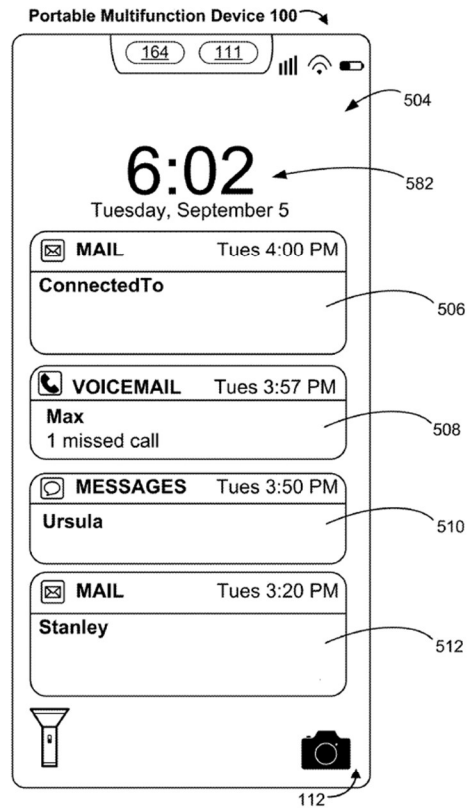


Figure 5B



FIG. 5A

80. Further, Lee’s disclosure of “the lock screen and associated widget is not viewable” when the display is off would have suggested to a POSITA that any associated notifications would also not be viewable when the display is off.

81. A POSITA would also have been motivated to implement the power button disclosed by Dascola and Lee in prior art devices, since this was a common element on mobile devices before the ‘352 patent that users would have expected a device to have.

3. **“after ceasing to display the wake screen user interface and the at least two or more notifications in response to the third input, detect a forth input for redisplaying the wake screen user interface”**

82. Dascola discloses that a “wake screen user interface 5002 [] is displayed when device 100 is activated from a screen-off state (e.g., a sleep state) to a screen-on state (e.g., a wake state).” EX1051 ¶242. Lee also discloses that “[t]he portable electronic device 1 may enter a wake state by a user pressing either the power button 6 or home button 4, in response to which the display screen 2 is turned on.” EX1070 ¶42. Thus, a POSITA would have understood that Lee Figs. 5A-5C illustrate the device ceasing to display the wake screen in response to an input at a power button, and subsequently redisplaying the wake screen user interface in response to another input, such as pressing either the power button or home button.

D. The Substitute Claims Lack Written Description Support

1. **Substitute Claims 28, 33, and 38 Lack Written Description Support**

83. Substitute Claims 28, 33, and 38 recite: “wherein determining whether the change in the orientation of the computer system satisfies the tilt angle threshold comprises determining whether the computer system is tilted from a position in which the computer system is substantially horizontal to a position in which the computer system is substantially vertical.”

84. Apple cites ¶¶160-163 and Figures 5A1-5A4 as allegedly supporting the amended features of these claims. Mot. at 19. Figures 5A1-5A4 generally illustrate activating a display in response to changing an orientation of a device. APPLE-2007 ¶162. However, these sections of the patent application state that the tilt angle threshold is satisfied *before* the computer system is “substantially vertical”:

In Figure 5A3, the device is tilted such that the display is more vertical than in Figure 5A2. *Because a tilt angle of the device has increased above a threshold tilt angle in Figure 5A3*, the display has transitioned from a screen-off state to a screen-on state and wake screen user interface 504 is displayed by the display 112. *In Figure 5A4, the display 112 is substantially vertical.*

APPLE-2007 ¶162 (emphasis added), Figs. 5A3-5A4.

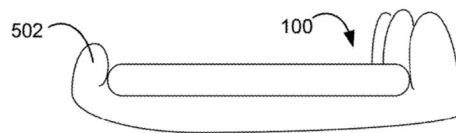


Figure 5A1

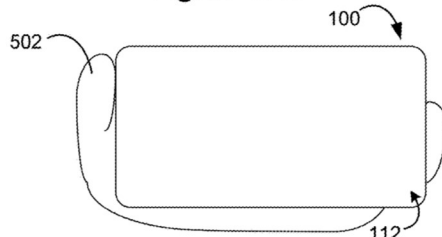


Figure 5A2

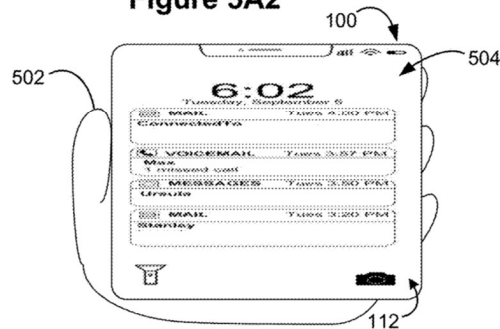


Figure 5A3

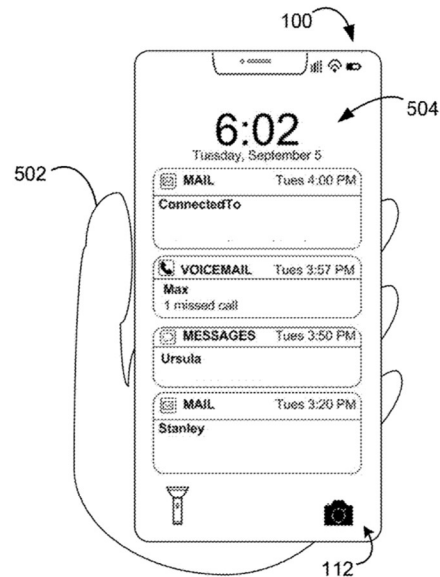


Figure 5A4

85. Thus, a POSITA would not have understood from the patent application's disclosure that "determining whether the change in the orientation of the computer system satisfies the tilt angle threshold comprises determining whether the computer system is tilted from a position in which the computer system is substantially horizontal to a position in which the computer system is substantially vertical." Rather, a POSITA would have understood that the threshold is satisfied before the computer system is substantially vertical.

86. Thus, Substitute Claims 28, 33, and 38 lack adequate written description support.

2. Substitute Claims 27, 32, and 37 Lack Written Description Support

87. Substitute Claims 27, 32, and 37 recite “controlling the display generation component to not be activated.” A POSITA would have understood that “controlling the display generation component to not be activated” requires the device to perform an affirmative step, such as sending a signal or instructions that cause the display not to activate. But the specification merely states that “[b]ecause a tilt angle of the device has not increased above a threshold tilt angle in FIG. 5A2, the display is not activated.” APPLE-2007 ¶162. A POSITA would have understood this disclosure to support “*controlling* the display generation component to not be activated,” as recited in the Substitute Claims, because a POSITA would have understood that controlling the display not to activate is different than simply not sending any signals at all.

88. Thus, Substitute Claims 27, 32, and 36 lack adequate written description support.

E. The Substitute Claims Contain Indefinite Terms

1. “Substantially Horizontal” And “Substantially Vertical” Are Indefinite

89. Substitute Claims 26, 31, and 36 recite “determining whether the computer system is tilted from a position in which the computer system is *substantially horizontal* to a position in which the computer system is *substantially*

vertical.” A POSITA would not have understood, with reasonable certainty, whether a specific orientation of the device is “substantially” horizontal or vertical within the context of these claims.

90. “Substantially horizontal” and “substantially vertical” are ambiguous terms that do not provide reasonable certainty as to how close to horizontal or vertical a computer system must be in order to satisfy the claim limitation. The specification does not resolve this ambiguity. Figures 5A1-5A4 generally illustrate transitioning from a screen-off state to a screen-on state upon detection of a tilt angle exceeding a threshold. The specification explains that “[i]n FIG. 5A1, the device is in a screen-off state while it is held flat in a user’s hand 502, such that the device is substantially horizontal.” EX1001, 38:5-7. Then, “[i]n FIG. 5A2, the device is tilted such that the display is more vertical than in FIG. 5A1.” *Id.*, 38:7-9. Figure 5A2 shows that the device is still in a screen-off state; thus, a POSITA would have understood that the tilt of the device illustrated in Figure 5A2 is not sufficient to transition to a screen-on state. However, neither Figure 5A2 nor the specification indicates the device’s tilt angle with any precision. Moreover, even if a precise tilt angle for Figure 5A2 were known, neither Figure 5A2 nor the specification discloses whether a device with the illustrated tilt angle is “substantially horizontal” or at what point the device would cease to be “substantially horizontal.”

91. The specification is not any clearer as to when the device would transition to a “substantially vertical” orientation. The specification states that “[b]ecause a tilt angle of the device has increased above a threshold tilt angle in FIG. 5A3, the display has transitioned from a screen-off state to a screen-on state and wake screen user interface 504 is displayed by the display 112.” *Id.*, 38:13-16. However, neither that figure nor the specification discloses the illustrated tilt angle of Figure 5A3 with any precision or suggests that the tilt angle is “substantially vertical.” The specification uses “substantially vertical” to describe the orientation of the display in Figure 5A4 (*id.*, 38: 16-17), but a POSITA could not have deduced, from the figure or the specification, the illustrated tilt angle with any precision. A POSITA would have no way of determining when the device, as it tilts from its Figure 5A3 orientation to its Figure 5A4 orientation, is oriented sufficiently closely to vertical to be deemed “substantially vertical.” Nor does the specification provide such guidance.

92. Thus, each of Substitute Claims 26, 31, and 36 are unpatentable as indefinite under 35 U.S.C. § 112(b).

2. “While Two Or More Notifications Remains Displayed” Is Indefinite

93. Substitute Claims 29, 34, and 39 recite “while two or more notifications remains displayed on the wake screen user interface.” However, none of the claims recite initially displaying notifications on a wake screen user interface. Moreover,

the rest of Substitute Claims 29, 34, and 39 recite “redisplaying the wake screen user interface” while previously displaying a control panel user interface. Because, within the context of the claims, the wake screen user interface is newly redisplayed, how notifications could “remain displayed on the wake screen user interface” is unclear. Thus, a POSITA would not have understood, with reasonable certainty, the meaning of the term “remains displayed”.

94. Thus, each of Substitute Claims 29, 34, and 39 are unpatentable as indefinite under 35 U.S.C. § 112(b).

3. Substitute Claims 27, 32, and 37 Are Indefinite

95. Substitute Claims 27, 32, and 37 depend from Substitute Claims 25, 30, and 35, respectively. In turn, Substitute Claims 25, 30, and 35 depend from Original Claims 1, 9, and 17, each of which recites “detecting an input that meets display-waking criteria.”

96. Substitute Claims 25, 30, and 35 add that detecting the input that meets the display-waking criteria comprises determining “whether a change in an orientation of the computer system satisfies a tilt angle threshold” and, in response to determining that the tilt-angle threshold is satisfied, transitioning to a screen-on state. However, Substitute Claims 27, 32, and 37, which depend from Substitute Claims 25, 30, and 33, recite a step of determining that the tilt-angle threshold is not satisfied and not activating the display, that purports to be part of detecting that the

input meets the display-waking criteria. A POSITA would not have understood how determining that the tilt-angle threshold is not satisfied and not activating the display could be part of determining that the input meets display-waking criteria.

VII. SECONDARY CONSIDERATIONS

97. I understand that secondary considerations of non-obviousness, such as commercial success, unexpected results, skepticism of others, long-felt-but-unmet need, etc., should be considered when evidence of such factors has been introduced. I am not aware of any evidence of secondary considerations. I reserve the right to respond to any evidence of secondary considerations introduced by Apple.

VIII. ERRATA SHEET

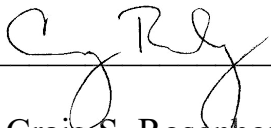
98. Exhibit 1071 is a true and correct copy of an errata sheet identifying errors in the transcript of my April 24, 2024, deposition taken in this case. I signed the errata sheet on May 29, 2024.

IX. CONCLUSION

99. For the foregoing reasons, it is my opinion that Substitute claims 25-39 of the '352 patent would have been obvious to a POSITA at the relevant time in view of the prior art referenced above.

100. I declare that all statements made herein on my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: May 31st, 2024

By: 
Craig S. Rosenberg, Ph.D.