

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Michael S. Smith
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AND COMPUTER PROGRAM PRODUCT

SUPPLEMENTAL DECLARATION OF DR. ANDREW COCKBURN

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I. INTRODUCTION

1. I have been retained as a technical expert by counsel on behalf of Apple Inc. (“Apple”/“Petitioner”) in Case No. IPR2024-01087 with respect to U.S. Patent No. 10,656,755 (“the ’755 patent”) (APPLE-1001).

2. I understand that this declaration (“Supplemental Declaration”) will be submitted in support of Petitioner’s Reply to Patent Owner’s Response to the Petition for *inter partes* review of the ’755 patent. This Supplemental Declaration supplements certain portions of my prior declaration in support of the Petition for this IPR Proceeding (APPLE-1003, “Prior Declaration”). In my Prior Declaration, I address many topics, including (but not limited to) my background and qualifications, the level of skill in art, an overview of the ’755 patent, a POSITA’s background knowledge, certain legal standards explained to me by counsel, and a detailed analysis of the prior art against the claim elements of the ’755 patent.

3. I maintain all of my earlier analysis and continue to hold the opinions expressed in my Prior Declaration. This Supplemental Declaration does not replace my Prior Declaration. These declarations are complementary and should be read in tandem. Accordingly, this Supplemental Declaration does not cover every topic addressed in my Prior Declaration.

4. In forming this Supplemental Declaration, I have considered the references listed in my original declaration (APPLE-1003, ¶15), my knowledge

and experience in this field, including my research and work experience in the field, my experience working with others involved in the field, and the third-party documents cited throughout my analysis. *See* APPLE-1003, ¶¶1-14 (discussing qualifications), ¶¶26-27 (discussing the level of skill for a “POSITA”). In addition, I considered the transcript from the deposition of Dr. Mahon (APPLE-1032) and the definition of “sway” (APPLE-1033).

5. Note that, unless I’ve indicated otherwise, all emphasis (bold/italics/underline) in any quoted text are ones I have added.

6. Although I cite and quote to selected portions of various references in this Supplemental Declaration, the reader should understand that these citations are representative examples. A POSITA would have viewed each reference in its entirety and in combination with other references. Accordingly, I intend the references identified in this Declaration to be viewed as incorporated in their entireties.

7. I am not, and never have been, an employee of Apple. I received no compensation for this Supplemental Declaration beyond my normal hourly compensation based on my time actually spent preparing this declaration. I will not receive any added compensation based on the outcome of any IPR or other proceeding involving the ’755 patent.

II. LEGAL PRINCIPLES

A. Anticipation

8. I have been informed that a patent claim is invalid as anticipated under 35 U.S.C. § 102 if each and every element of a claim, as properly construed, is found either explicitly or inherently in a single prior art reference. Under the principles of inherency, if the prior art necessarily functions in accordance with, or includes the claimed limitations, it anticipates.

9. I have been informed that a claim is invalid under 35 U.S.C. § 102(a) if the claimed invention was known or used by others in the U.S., or was patented or published anywhere, before the applicant's invention. I further have been informed that a claim is invalid under 35 U.S.C. § 102(b) if the invention was patented or published anywhere, or was in public use, on sale, or offered for sale in this country, more than one year prior to the filing date of the patent application (critical date). And a claim is invalid, as I have been informed, under 35 U.S.C. § 102(e), if an invention described by that claim was described in a U.S. patent granted on an application for a patent by another that was filed in the U.S. before the date of invention for such a claim.

B. Obviousness

10. I have been informed that a patent claim is invalid as "obvious" under 35 U.S.C. § 103 in light of one or more prior art references if it would have been obvious to a POSITA, taking into account (1) the scope and content of the prior art,

(2) the differences between the prior art and the claims, (3) the level of ordinary skill in the art, and (4) any so called “secondary considerations” of non-obviousness, which include: (i) “long felt need” for the claimed invention, (ii) commercial success attributable to the claimed invention, (iii) unexpected results of the claimed invention, and (iv) “copying” of the claimed invention by others. For purposes of my analysis above and because I know of no indication from the patent owner or others to the contrary, I have applied a date of August 5, 2011, as the date of invention in my obviousness analyses, although in many cases the same analysis would hold true even at an earlier time than August 5, 2011.

11. I have been informed that a claim can be obvious in light of a single prior art reference or multiple prior art references. To be obvious in light of a single prior art reference or multiple prior art references, there must be a reason to modify the single prior art reference, or combine two or more references, in order to achieve the claimed invention. This reason may come from a teaching, suggestion, or motivation to combine, or may come from the reference or references themselves, the knowledge or “common sense” of one skilled in the art, or from the nature of the problem to be solved, and may be explicit or implicit from the prior art as a whole. I have been informed that the combination of familiar elements according to known methods is likely to be obvious when it does

no more than yield predictable results. I also understand it is improper to rely on hindsight in making the obviousness determination.

III. OVERVIEW OF CONCLUSIONS FORMED

12. This declaration explains the conclusions that I have formed based on my analysis. To summarize those conclusions, based upon my knowledge and experience and my review of the prior art publications listed above, I believe that:

- Claims 1-3, 7, 10-11, 13, 15, 17, 20, 23-25, 29, 32-33, 35, 37-38, and 41-42 are obvious over Hackborn in view of Westerman (Ground 1A)
- Claims 4-5, 8-9, 21-22, 26-27, 30-31, and 43 are obvious over Hackborn in view of Westerman and Townsend (Ground 1B)
- Claim 16 is obvious in view of Hackborn in view of Westerman and Jablonski (Ground 1C)
- Claims 18-19 and 39-40 are obvious over Hackborn in view of Westerman and Jobs (Ground 1D)
- Claims 1, 4-8, 10-12, 15, 17-20, 23, 26-30, 32, 34, and 37-42 are obvious over Hackborn in view of Westerman and Jobs (Ground 2)

IV. LEVEL OF ORDINARY SKILL IN THE ART

13. In my opinion, a person of ordinary skill in the art (“POSITA”) relating to, and at the time of, the purported invention of the ’755 Patent would have had at least a bachelor’s degree in computer science, computer engineering, electrical engineering, human-computer interaction, or a related field, and would have had at least two years of relevant work experience in the design and

development of graphical user interfaces (GUIs), human-computer interfaces, or equivalents thereof. Less work experience may be compensated by a higher level of education and vice versa.

14. Based on my experiences, I have a good understanding of the capabilities of one of ordinary skill. Indeed, I have taught, participated in organizations, and worked closely with many such persons over the course of my career. Based on my knowledge, skill, and experience, I have an understanding of the capabilities of one of ordinary skill. Furthermore, I possess those capabilities myself.

V. INTERPRETATIONS OF THE '755 PATENT CLAIMS AT ISSUE

15. I have been informed by Counsel and understand that the best indicator of claim meaning is its usage in the context of the patent specification as understood by one of ordinary skill. I further understand that the words of the claims should be given their plain meaning unless that meaning is inconsistent with the patent specification or the patent's history of examination before the Patent Office. Counsel has also informed me, and I understand that, the words of the claims should be interpreted as they would have been interpreted by one of ordinary skill at the time of the invention was made (not today). I have been informed by Counsel that I should use August 5, 2011 as the point in time for claim interpretation purposes.

VI. Hackborn-Westerman Renders Claims 1-3, 7, 10-11, 13, 15, 17, 20, 23-25, 29, 32-33, 35, 37-38, and 41-42 Obvious (Ground 1A)

16. Smith’s arguments regarding Ground 1A—both as to the motivation to combine and the individual claim elements—are premised on a misunderstanding and/or mischaracterization of Hackborn and Westerman.

A. Smith Fails to Undermine the Strength of the Combination

17. Smith’s arguments concerning motivation to combine, which are largely based on the faulty premise that Hackborn’s device animates its live grass wallpaper responsive to a tap (it does not) or to a swipe (it does), fails to counter the Petition’s strong motivation to combine Hackborn and Westerman.

1. Smith Misunderstands Hackborn’s Disclosure of Its Live Grass Wallpaper

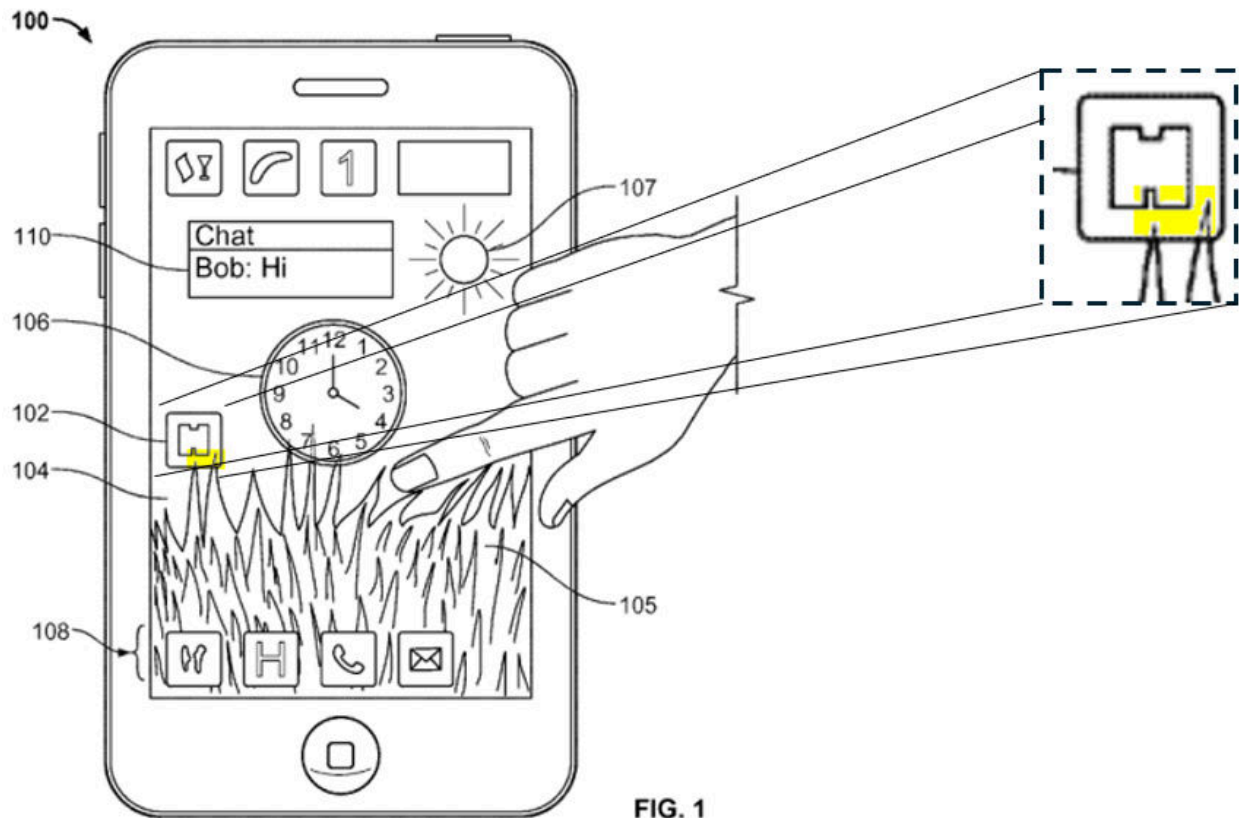
18. Smith argues that the Petition fails to show that Hackborn “discloses or suggests distinguishing between taps and swipes on its wallpaper” and that suggests that nothing “prevents the grass from moving in response to a tap.” POR, 21, 24. In alleging that Hackborn’s live grass wallpaper is responsive to taps, however, Smith misunderstands Hackborn’s explicit teaching. Specifically, as described further below, Hackborn only explicitly teaches its live grass wallpaper as being animated responsive to swipes, and it only explicitly teaches a response to taps in the context of mode-switching functionality.

(a) Hackborn Only Explicitly Teaches Animating Its
Live Grass Wallpaper in Response to Swipes

19. First, as Patent Owner's expert Dr. Mahon acknowledged, while Hackborn discloses animating grass in response to a *swipe*, Hackborn provides no other explicit example input gestures that cause the glass wallpaper to move. APPLE-1032, 72:3-11, 119:15-21 ("I don't recall any other [gestures] specifically"). Rather, the entirety of Hackborn's discussion of the live grass wallpaper pertains to its reaction to a *swipe*. For example, Hackborn discloses that swipes animate grass in its live wallpaper, explaining, "a user is *swiping* her finger across a touch-sensitive display screen of the computing device," and "the blades of grass 105 displayed in the area of the screen *swiped* by the user are caused to bend or sway as if contacted by the user's finger during the *swipe*." APPLE-1004, [0028].

20. Second, animating grass based on taps introduces technical challenges not addressed in Hackborn. For example, as shown in Hackborn's FIG. 1 (reproduced below), the grass can overlap icons. Regarding the overlapping of displayed icons and gadgets with the wallpaper, Hackborn states "when an element of the wallpaper 104 overlaps in the x-y dimension (that is, in the plane of the display) with an icon 102 or gadget 106, the icon or gadget will receive priority for display so that it looks to the user like it is positioned closer to the user than is the wallpaper." APPLE-1004, [0029]. See also *Id.* [0025]. Hackborn further clarifies

that such overlapping may include the use of transparency effects – “the portion of grass 105 behind icon 102 is still displayed, albeit less prominently than the grass 105.” *Id.* [0030].



APPLE-1004, FIG. 1 (annotated; zoomed-in).

21. Hypothetically, a tap on the overlapping content could either animate the grass or activate the icon. However, because Hackborn does not teach a tap animating the grass, it need not address a potential conflict based on the overlap. *Id.* Further, this issue does not arise in Hackborn’s actual disclosure: a POSITA would have understood that a tap on an icon activates it (even if the background overlaps), as Dr. Mahon confirmed, and a swipe animates the background (even

when the swipe passes over an icon). APPLE-1032, 113:11-14 (“a tap in certain cases would be consistent with the disclosures in Hackborn for launching applications”); APPLE-1004, [0028] (“a user is swiping her finger across a touch-sensitive display screen of the computing device”; “[i]n response, the blades of grass 105 displayed in the area of the screen swiped by the user are caused to bend or sway as if contacted by the user’s finger during the swipe”). Moreover, Hackborn does not contemplate this conflict despite showing that grass can overlap an icon (in Figure 1), suggesting that such a conflict does not occur in Hackborn’s device. That is, Hackborn has no need to discuss resolving the question as to whether a tap on the overlapping area would animate the grass or activate the icon because Hackborn does not describe animating its live grass wallpaper in response to taps. APPLE-1004, [0028] (“*Other examples of live wallpaper* may not be immediately responsive to user input on the screen of the device.”). In fact, Smith comments that “Hackborn does not disclose two different functions being initiated by two different inputs in the same place.” POR, 10.

22. Further, Smith’s reliance on Hackborn’s disclosure of “tapping on the display screen a predetermined number of times within a predetermined time period” in support of its position that Hackborn’s live grass wallpaper is responsive to taps is misleading. POR, 24-25. Significantly, Hackborn mentions “tapping on the display screen a predetermined number of times with a predetermined time

period” when offering “[o]ther examples of live wallpaper” and other “[e]xamples of predetermined user inputs.” Moreover, Smith’s suggestion that multiple taps are required to switch modes in Hackborn does not overcome the shortcomings of Hackborn’s device that prevent translating a tap into the same responsive display in the live grass wallpaper that occurs in response to a swipe. Instead, as discussed below in §IV.A.1(b), the multiple taps taught by Hackborn are used for an entirely different purpose. That Hackborn offers multiple taps as an example input that causes a mode switch actually further supports the position that Hackborn’s live wallpaper is not animated responsive to taps—singular or “a predetermined number of times within a predetermined time period”—and instead that these tap inputs—otherwise unsupported by Hackborn’s device to correlate to an animated response in the live grass wallpaper (§VI.A.1(b))—are reserved to perform other actions on the device.

(b) Hackborn’s Device is Not Equipped to Animate Its
Live Grass Wallpaper Responsive to Taps

23. As mentioned above, Hackborn’s device is not equipped to animate the live grass wallpaper in response to a tap. Hackborn teaches that the live wallpaper’s “blades of grass 105 displayed in the area of the screen swiped by the user are caused to bend or sway as *if contacted* by the user’s finger *during the swipe*.” APPLE-1004, [0028]. That is, Hackborn’s device is configured to receive a swipe input and display the responsive movement of grass. *Id.*; APPLE-1032,

78:7-8 (“the user’s expecting the grass in Hackborn to bend or sway in some realistic manner”), 99:4-6 (“the user contacting the grass during that swipe [] would cause the grass to be animated in a realistic manner consistent with that swipe”). In contrast to a swipe, which involves a side-to-side motion that directly translates to the side-to-side motion of grass on the live wallpaper (e.g., based on the speed and length of the swipe), a tap input on Hackborn’s device offers inadequate data from which to generate a responsive movement on the live grass wallpaper.

24. Smith’s own analysis of Hackborn confirms that a tap offers insufficient data to cause the animation of the live grass wallpaper disclosed by Hackborn. Specifically, Smith states that “Hackborn does not need a threshold determination between taps and swipes to initiate movement of the grass because *the grass already moves based on the magnitude of contact,*” that “Hackborn discloses that the user input on the live grass wallpaper generates *vector data representing the position, direction, and speed of the contact,*” and that “*the vector data is what determines the magnitude of the visual effect* of the dynamically generated grass animation.” POR, 25. But the only data that represents any magnitude in the vector that Smith identifies is speed and direction; a POSITA would understand that position, in contrast, is a single coordinate in x, y space, and therefore position lacks any associated magnitude. Importantly, a tap

has an x, y position, but it has no speed and no direction, and therefore there is no magnitude on which to, by Smith's own words, move the grass "based on the magnitude of the contact."

25. Under a hypothetical analysis, the pressure associated with a tap input might offer magnitude data regarding how much or how far the tapped grass should move. A POSITA would have understood that pressure, or the force applied to the area tapped by the user, might offer a corollary to the speed and/or length of a swipe input. On a typical touchscreen device, determining that pressure requires a pressure sensor, a component that Hackborn lacks, as Dr. Mahon confirms. APPLE-1004, [0060]-[0078]; APPLE-1032, 102:13-17 (admitting he does not "recall specifically any part of Hackborn discussing pressure" and "can't find an area in Hackborn specifically discussing pressure"); *see also* APPLE-1005, [0070]-[0071] (silent as to a pressure sensor). Dr. Mahon further confirms that Hackborn uses a vector of three values (position, direction, speed) to animate the grass. APPLE-1032, 89:20-90:4 ("with respect to the vector disclosure of position, direction and speed also discloses, consistent with the rest of the disclosures in Hackborn, that – from a perspective of a POSITA that – that the – that information would be used and generated – used to animate the grass"); APPLE-1004, [0033] ("The message that passes the information may indicate a vector representing the position, direction, and speed of the user's dragging motion"). Since Hackborn

does not disclose a vector element to store a pressure value or a pressure sensor from which to obtain such a value, Hackborn's device has no mechanism for measuring pressure and thus determining how to animate grass responsive to a tap input. Moreover, since Hackborn does not contemplate pressure as an input, a POSITA would not have understood that Hackborn's grass reacts to taps. Furthermore, a POSITA would not be motivated to provide any displayed movement of the grass in response to a tap because any such displayed movement would be likely to be obscured from the user's view by the finger conducting the tap.

26. Further, Smith's interpretation of Hackborn's disclosed response to "tapping on the display screen a predetermined number of times" contradicts the clear disclosures of Hackborn. Smith states, "Hackborn's disclosure that "tapping on the display screen a predetermined number of times within a predetermine time period" confirms that a single tap would—just like a swipe or any other input on the wallpaper—move the grass." POR, 24. However, Hackborn discloses the opposite. First, Hackborn is clear that its disclosure of taps relates to a mode switching function in its "other example" embodiments: "Other examples of the live wallpaper *may not be immediately responsive* to user input ... but *may become responsive only after* a predetermined input ... Examples of predetermined input to *cause the live wallpaper to become responsive* can include

... tapping on the display screen a predetermined number of times.” APPLE-1004, [0028]. Thus, Hackborn discloses that tapping a predetermined number of times (in its other embodiments) serves the function of a mode switch that enables the live wallpaper to become responsive to subsequent swiping inputs. *Id.* Second, while Hackborn discloses that there may be a display change in response to the mode switching, it does not disclose or suggest any bending, swaying, or other animation to the grass; rather, its disclosures focus on display changes to the icons and other overlying objects (which, as established earlier, may occlude parts of the live grass wallpaper): “When such mode switching occurs, the appearance of the wallpaper and the icons or other overlying objects may change, such as changing the icons to a transparent or shadowed appearance.” *Id.* Thus, Hackborn does not disclose any animation of the live grass wallpaper, such as bending or swaying, in response to a tap.

2. Hackborn’s Device Must Distinguish Between Swipes and Taps

27. Contrary to Smith’s assertion, Hackborn’s device must distinguish between swipes and taps at least because the device responds differently to these two inputs.

28. For example, Hackborn teaches animating live grass wallpaper responsive to a *swipe*. In other example embodiments, Hackborn also teaches switching the mode of the device responsive to “*tapping* on the display screen a

predetermined number of times within a predetermined time period.” APPLE-1004, [0028]. Furthermore, a POSITA would have understood that icons are selected via *taps*, which Dr. Mahon confirmed. APPLE-1032, 113:11-14 (“a tap in certain cases would be consistent with the disclosures in Hackborn for launching applications”); *see also* APPLE-1004, [0004]-[0005]. Therefore, because Hackborn teaches that its device reacts differently depending on the gesture (e.g., tap, swipe, multiple taps), Hackborn must distinguish among them.

29. Thus, while silent regarding details on *how* distinguishing between gestures would be implemented, Hackborn’s device necessarily distinguishes between taps and swipes. APPLE-1032, 112:7-9 (“Hackborn discloses and discusses certainly taps and swipes [] in the specification”), 113:10-15 (“[c]ertainly Hackborn discloses a user interacting with the device and certainly a tap in certain cases would be consistent with the disclosures in Hackborn for launching applications, for example”), 118:18-19:7 (“It depends upon implementation. It’s clear what Hackborn is disclosing, that multiple taps could be used to change the mode of the device. *And that’s all that Hackborn discloses.*”), 121:21-122:8 (“... to a POSITA it’s clear that they’re saying that there’s multiple taps within a given time period to make that determination. *It doesn’t go beyond that teaching, as far as I know.*”).

30. Further, Smith incorrectly asserts that “the location of the user input on the screen determines what the Hackborn’s display controller recognizes as the target of the user’s selection or touch.” POR, 10. A POSITA would have understood that the gesture and its location determine the target. For example, swiping across an icon would not activate the icon, and thus the location alone does not determine the target.

31. Relatedly, Smith also incorrectly asserts that “Hackborn does not disclose two different functions being initiated by two different inputs in the same place.” POR, 10. Dr. Mahon admits that “a tap in certain cases would be consistent with the disclosures in Hackborn for launching applications,” and “the user contacting the grass during that swipe [] would cause the grass to be animated in a realistic manner consistent with that swipe.” APPLE-1032, 99:4-6; 113:11-14. Additionally, Hackborn discloses that icons and gadgets can be moved on the display by moving gesture inputs, stating “if a user presses on an icon 102 or gadget 106, moves it by dragging their finger, and then releases it...” APPLE-1004, [0034]. In this example, pressing then dragging creates a result different from a tap or a swipe. Therefore, a POSITA would have understood that for a tap at a location, the target is the launched application while a swipe over that same location animates the wallpaper.

3. Smith's Characterization of Westerman and the Hackborn-Westerman Combination Are Wrong

(a) Westerman's Teachings are Broader than Smith's Overly Narrow Characterization

32. Contrary to Smith's overly narrow characterization of "Westerman's approach to swipe detection (and distinguishing taps) [being] specific to the context of virtual keyboards," Westerman more broadly teaches that the "present invention can also relate to a computer system including a multi-touch interface that has been adapted and/or programmed to detect and process swipe gesture input in the various ways described above." APPLE-1005, [0025]; see POR, 11. Therefore, Westerman itself states that the invention applies generally to computer systems with a multi-touch interface and is not limited to virtual keyboards. Indeed, the Petition relied on Westerman's teachings in a combination of a device with live wallpaper, per Hackborn, with Westerman's disclosure of methods for distinguishing between tap and swipe gestures (e.g., using predetermined thresholds). Pet, 10; APPLE-1003, ¶52.

33. Further, Westerman's summary reflects the invention's broad applicability:

Detecting a swipe gesture can include acquiring touch image data from the touch-sensitive device, processing the image to generate one or more finger path events, determining a displacement of the one or more finger path events, and detecting a swipe gesture if the displacement exceeds a predetermined threshold. If the

displacement does not exceed the threshold, the input can be interpreted as a conventional tap. The time of the motion associated with the input can also be compared to a maximum swipe gesture timeout threshold. If the timeout threshold is exceeded, the input can be interpreted as a conventional tap.

APPLE-1005, [0019].

34. Thus, Westerman's techniques for distinguishing swipes (displacement exceeds a threshold) from taps (displacement does not exceed a threshold) are not limited to virtual keyboards (or to any other specific device context) as Smith alleges; virtual keyboards are merely an example. Moreover, a POSITA would have understood that Westerman's methods could readily be deployed on any touchscreen graphical user interface. *Id.*

(b) Westerman Determines Swipes Based on Thresholds

35. Further, Smith improperly limits Westerman's teachings as applying only to taps and swipes in the same area. POR, 12. Rather, Westerman states generally that the "time of the motion associated with the input can also be compared to a maximum swipe gesture timeout threshold," and "[i]f the timeout threshold is exceeded, the input can be interpreted as a conventional tap." APPLE-1005, [0019]. Nothing in Westerman's disclosure limits its gesture-differentiating methods to a particular area of the screen. APPLE-1005, *generally*.

36. Smith further mischaracterizes Westerman, stating that “Westerman also does not suggest distinguishing between taps and swipes where gestures are instead distinguished spatially—i.e., where Westerman’s approach is unnecessary to determine a user’s intended input.” POR, 13. Westerman provides no example where its approach is “unnecessary.” Rather, Westerman states clearly that “determining a displacement of the one or more finger path events, and detecting a swipe gesture if the displacement exceeds a predetermined threshold,” and “[i]f the displacement does not exceed the threshold, the input can be interpreted as a conventional tap.” APPLE-1005, [0019].

(c) The Petition Does Not Bodily Incorporate
Westerman

37. Smith’s arguments concerning a lack of a motivation to combine due to Westerman’s specific discussion of virtual keyboards are a mere distraction to the strength of the combination. The Petition argues that, “[t]o the extent Hackborn lacks details on how to distinguish taps from swipe inputs,” a POSITA would have naturally looked to Westerman. Pet., 12. And, because “Hackborn explains that its device can register both swipes and taps (APPLE-1004, [0028]), a POSITA would have found it obvious to implement Hackborn with methods such as those disclosed or rendered obvious by Westerman for distinguishing between tap and swipe gestures (e.g., using ‘predetermined thresholds’).” Pet., 13. Smith’s characterization of Westerman as “focuse[d] on differentiating ‘tap’ versus ‘swipe’

inputs solely on a virtual keyboard” (POR, 23) suggests that the Petition intended to bodily incorporate Westerman—and, specifically, its distinguishing of swipes and taps solely in the context of virtual keyboards—into Hackborn, which the Petition did not do. The Petition relies on a combination of specific teachings of references rather than any bodily incorporation. *E.g.*, Pet., 12-13 (stating that a POSITA reviewing Hackborn would have looked to Westerman to “better understand how to implement Hackborn’s teachings, for example, how to discern between different user inputs (e.g., tap or swipe),” per Westerman), 13 (“a POSITA would have found it obvious to implement Hackborn with methods such as those disclosed or rendered obvious by Westerman for distinguishing between tap and swipe gestures (e.g., using “predetermined thresholds”), 13-14 (“A POSITA would have recognized that applying Westerman’s teachings and using these thresholds (“predetermined threshold” and a threshold pertaining to velocity) for distinguishing between taps and swipes in Hackborn’s device would have led to predictable results without significantly altering or hindering the functions performed by Hackborn’s device, particularly because Hackborn already contemplates receiving both types of inputs (tap and swipe)”).

4. A POSITA Would Have Been Motivated to Incorporate Westerman’s Teachings Regarding Distinguishing Taps and Swipes To Implement Hackborn’s Device

38. A POSITA would have been motivated to combine Hackborn and Westerman at least because Hackborn’s device must distinguish between taps and swipes but Hackborn does not offer details for doing so, while Westerman provides “implementation details ... , for example, how to discern between different types of user inputs—namely, a tap or a swipe.” APPLE-1003, ¶¶52-53; §II.A, *supra*. Smith willfully ignores Hackborn’s silence on implementation details when alleging that the Petition lacks “any identification of an actual problem in Hackborn’s live grass wallpaper that would cause a POSITA to look to other prior art teachings to address.” POR, 21-22. Smith’s argument that “Hackborn has no need to distinguish between swipes and taps in the context of animating its grass” simply ignores the fact that Hackborn’s live grass wallpaper is animated in response to swipes and not to taps, thus necessitating distinguishing between the gestures. APPLE-1004, [0028]; §II.A.2, *supra*; POR, 21-22. Moreover, assuming, for the sake of argument, that Hackborn’s device could process a tap and display an animated response on its live grass wallpaper (which it cannot), as Smith alleges, Hackborn’s device would then necessarily need to distinguish between a tap and a swipe because these two inputs would display two different animations on the live wallpaper, such as “mak[ing] the grass blades look as if the finger is

actually contacting them as it drags across the screen” in response to swipes (APPLE-1004, [0033]), and making the grass blades look as though they are pushed away in response to taps.

39. Further, offering no support from Hackborn, Smith blindly argues that “Hackborn is directed towards live wallpapers that broadly respond to user contact, and distinguishes between the intended result of different inputs by determining whether a given input contacts the wallpaper or an icon displayed above the wallpaper.” POR, 21-22. However, Smith’s position ignores the real possibility of a given user input contacting a portion of the display where an icon overlaps with the wallpaper, described in §II.A.2. APPLE-1004, [0025], [0029]-[0030], FIG. 1. In that scenario, if both the wallpaper and the icon could be responsive to a tap, Hackborn would need a mechanism by which to determine how to respond to the potential conflict. However, such a mechanism is not needed because no conflict exists: Hackborn’s explicit teaching with respect to its live grass wallpaper, which is the focus of Ground 1A, relates to animations displayed responsive to swipes and not taps. Thus, Hackborn’s device can simply respond to a tap on an icon overlapping wallpaper by either changing modes (in the case of multiple taps) or selecting icons.



APPLE-1004, FIG. 1 (excerpt, highlighted)

40. More, though Hackborn explains that “the blades of grass 105 displayed in the area of the screen swiped by the user are caused to bend or sway as if contacted by the user’s finger during the swipe,” Smith alleges that Hackborn does not “suggest any need to perform additional, different functions based on directional swipes” without explaining how grass can be displayed to “sway as if contacted by the user’s finger during the swipe” unless the direction of the swipe is considered. APPLE-1004, [0028]; POR, 22. Hackborn is clear that the “animating motion may include bending one or more graphical elements *in a direction of the dragging input.*” APPLE-1004, [0008].

41. Finally, Smith’s argument that Westerman’s use of a threshold determination is a “binary determination with a binary result” incompatible with Hackborn is irrelevant in the context of the Petition’s combination. POR, 26. In the Hackborn-Westerman combination, Hackborn teaches how to determine the magnitude of a touch input (e.g., using a vector of position, direction and speed), while Westerman teaches how to use duration to determine whether a touch input

is a tap or swipe. APPLE-1004, [0033]; APPLE-1005, [0019] (“detecting a swipe gesture if the displacement exceeds a predetermined threshold”); APPLE-1003, ¶48; Pet., 11-12. In the combination, if the touch input on the wallpaper is a swipe—because the displacement exceeds a predetermined threshold, the grass is animated responsive to the swipe movement; if the touch input on the wallpaper is a tap, the live wallpaper is not caused to animate. Pet., 20-23; APPLE-1004, [0028]. Smith’s arguments concerning the supposed “goal of Westerman” is unrelated to the combination’s straightforward reliance on Westerman—to determine whether an input is a tap or a swipe. *See* POR, 26.

B. Claims 1 and 23 Are Obvious

42. Hackborn describes a mechanism for animating grass that includes considering multiple factors that cause blades of grass “to bend or sway as if contacted by the user’s finger during the swipe.” APPLE-1004, [0028], [0033]. In Hackborn, “a vector representing the position, direction, and speed of the user’s dragging motion” is used “to generate an animation that makes the grass blades look as if the finger is actually contacting them as it drags across the screen of the device 100.” APPLE-1004, [0033]. Hackborn directly contradicts Smith’s assertion that “a POSITA would understand that Hackborn’s only disclosed criteria for causing a change to the grass is contact with a finger, not path length or velocity.” *See* POR, 27-28. Rather, as Petitioner states,

Hackborn explains that touch input received by its device may be used to provide “***a vector representing the position, direction, and speed of the user’s dragging motion,***” which “may then be used by the process executing the wallpaper 104 to determine that the user’s finger contacted items on the wallpaper—here, the grass 105.” [APPLE-1004], [0033]. “***Such information may be used to generate an animation that makes the grass blades look as if the finger is actually contacting them as it drags across the screen of the device 100.***” *Id.*

Pet., 11.

43. Similarly, Hackborn’s explicit disclosure of composite live wallpaper—including the live grass wallpaper and images from social media websites—directly contradicts Smith’s assertion that “Petitioner manufactures these composites to insert specific features from one embodiment into another in order to meet a specific claim limitation, and does not provide any explanation of why a POSITA would have combined these particular aspects of those wallpapers in the manner proposed.” APPLE-1004, [0050]; APPLE-1003, ¶¶70-73; POR, 29-30. For example, Hackborn states that “***live wallpaper can include a combination of the described wallpaper examples,***” e.g., “***images (such as images 406 a-h in FIG. 4) and information (such as posts 606 a-e in FIG. 6) from social networking sites may be combined for presentation in a live wallpaper display.***” APPLE-1004, [0050]. Smith’s argument ignores Hackborn’s explicit teaching of such composite wallpapers.

C. Claims 7 and 29 Are Obvious

44. For the reasons discussed in §II.A.2, Hackborn's device animates grass in response to swipes, but the live wallpaper does not animate grass in response to taps. APPLE-1004, [0028]; §II.A.1, *supra*. Further, Hackborn states that when mode switching occurs (e.g., in response to "tapping on the display screen a predetermined number of times within a predetermined time period"), "the appearance of the wallpaper and the icons or other overlying objects *may* change." APPLE-1004, [0028]. Because Hackborn merely states that wallpaper's appearance *may* change, a POSITA would have understood of found obvious that, at least in some cases, the appearance does not change. Therefore, in at least such cases, when a first input is a tap, the appearance of the background is maintained (i.e., it remains unchanged). APPLE-1003, ¶¶77-78.

D. Claims 17, 37, and 38 Are Obvious

45. As described in §II.A, Hackborn describes live wallpaper that includes components (including animations and social media feeds) in various combinations. APPLE-1004, [0050]; §II.A. Hackborn offers reasons for creating a composite wallpaper, explaining that, with live wallpaper, "change[s] in appearance may provide updated information, altered aesthetics, a change of theme, environment or pace, or a diversion from the status quo." APPLE-1004, [0026]; *see* POR, 33-34.

46. The Petition explains that change of appearance of the background includes grass swaying and “any number of other images (e.g., photographs from the camera; social media images).” Pet., §IV.A.4[1.1]. Smith’s contention that “the scrolling images in the social media feed cannot be the ‘at least some of the plurality of images’ that must display sequentially by ‘automatically moving, one-by-one’ in response to a user’s contact of sufficient magnitude” fails to acknowledge that “the at least some of a plurality of images” can include both the swaying grass (which moves in response to dragging/swiping contact) and the social media feed (which scrolls automatically as new entries arrive). POR, 34; APPLE-1003, ¶¶86-87. Since the Hackborn-Westerman device’s background includes both animated grass and a social media feed, claim 17 is obvious, and claims 37-38 are obvious for the same reasons.

E. Claims 2-3, 7, 10-11, 13, 15, 17, 20, 24-25, 32-33, 35, 37-38, and 41-42 Are Obvious

47. Smith offers no independent argument regarding claims 2-3, 7, 10-11, 13, 15, 17, 20, 24-25, 32-33, 35, 37-38, and 41-42. Because claims 1 and 23 are obvious, these dependent claims are also obvious. *See* §II.B.

VII. Hackborn-Westerman-Townsend Renders Claims 4-5, 8-9, 21-22, 26-27, 30-31, and 43 Obvious (Ground 1B)

A. Smith Misunderstands or Mischaracterizes Townsend in the Hackborn-Westerman-Townsend Combination

48. Townsend “simulate[s] real-world behavior of application objects.”

APPLE-1006, Abstract. Smith’s characterization of Townsend ignores this explicit disclosure in Townsend in an attempt to limit Townsend’s teaching, for example, alleging that “Townsend does not describe its inertia system as simulating the movement, flexibility, or internal and external friction of an object that is fixed in position, like grass.” POR, 16; *see id.*, 36 (“swaying, anchored grass of Hackborn”).

49. First, rather than acknowledge Townsend’s broad teachings, Smith selectively quotes Townsend in a manner that omits significant language from Townsend. For instance, Smith limits “Townsend’s inertia system” as ““receiv[ing] manipulations that only describe the movement of an object based on the movement of contacts with the multi-touch hardware.”” POR, 36 (quoting APPLE-1006, [0016]). Notably, Smith omits from its quoted language Townsend’s broader explanation of its inertia system, including “to move naturally, objects should also exhibit physical characteristics *such as elasticity* and deceleration,” and “the inertia system actually generates the events based on a simulation of the behavior of the objects,” e.g., “if the user lifted the contacts while

the object had a velocity in a particular direction, then inertia system continues sending events that indicate that the object is moving in that direction, slowing down over time as the object decelerates.” APPLE-1006, [0016]. Thus, in contrast to Smith’s truncated quote, Townsend’s goal is clear: simulating the natural movement of objects, including elasticity and deceleration. APPLE-1006, [0016]. A POSITA would have understood such deceleration occurs because of simulated friction between the object and air, and thus describes friction in its simulation of real-world behavior.

50. Second, Smith incorrectly characterizes Townsend as being limited to “movement of objects across a screen and colliding into each other,” thus incorrectly concluding that Townsend’s teaching is inapplicable to the “swaying, anchored grass of Hackborn.” POR, 16, 36. Rather, Townsend explicitly teaches that “initialization information may also specify a *pivot point* of the object.” APPLE-1006, [0022]. A POSITA would have understood that a pivot point is relevant to fixed objects such as the grass in Hackborn’s live wallpaper. Thus, from the totality of Townsend’s teachings, a POSITA would have understood Townsend’s broader applicability.

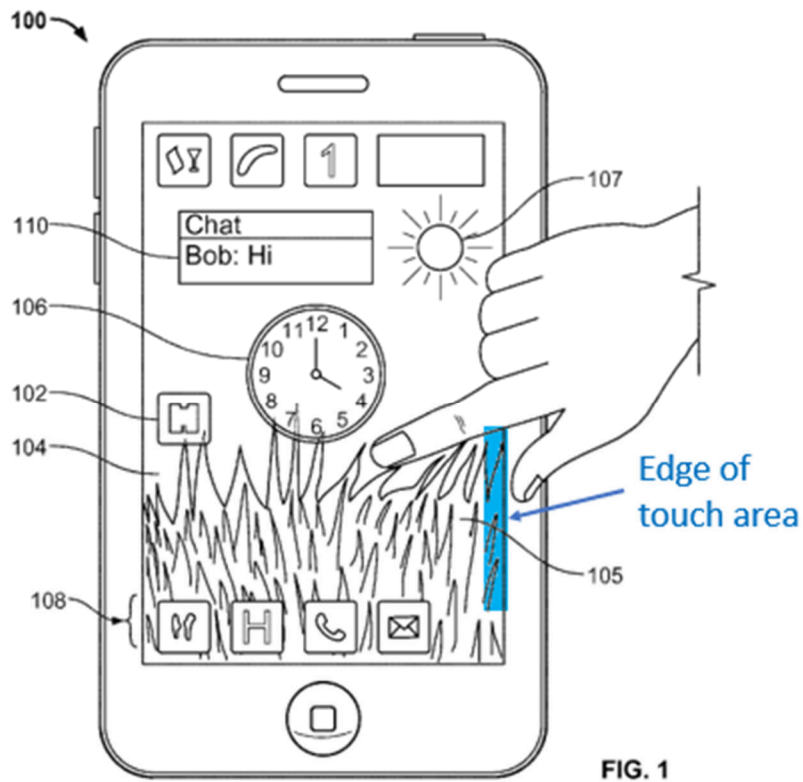
51. Further, Smith’s argument that a “POSITA would see little relevance of Townsend to Hackborn’s grass animation because Townsend’s inertia engine does not model the deformation or bending of flexible objects in response to a

force being applied” and “there are no freely moving objects in Hackborn’s live grass wallpaper that would prompt a POSITA to look for a system like Townsend’s” is again based on its mischaracterization of Townsend as being limited to addressing freely moving objects. POR, 37.

B. Claims 5, 8, 27, and 30 Are Obvious

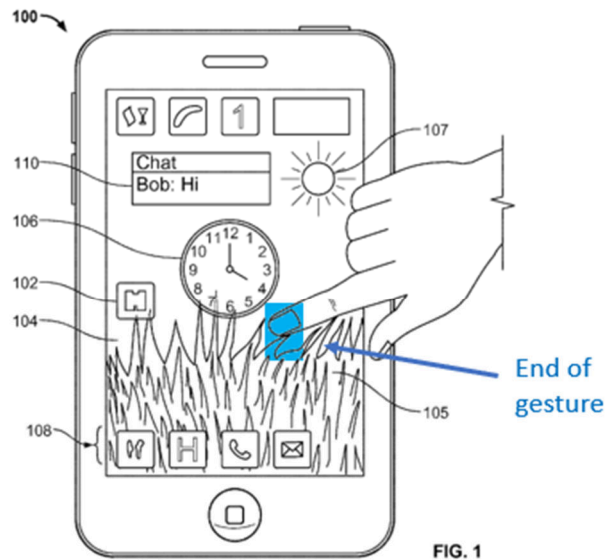
52. Hackborn-Westerman-Townsend renders obvious that decay begins following detection of a cessation of the first contact, as claims 5 and 27 require. For example, “[a] POSITA would have recognized that the motion of grass decays (decelerates) once the swipe ceases, per Townsend.” APPLE-1003, ¶121. Smith does not contest this point. POR, 39-40. Instead, Smith’s challenge of these claims is limited to the timing of when decay would occur. POR, 39-40.

53. Additionally, for example, when the grass is at the outer edge of the touch screen (as illustrated below), and the user is swiping left-to-right, the decay will begin following detection of a cessation of the first contact and corresponding to the cessation of contact with the touch screen. APPLE-1003, ¶121.



APPLE-1004, FIG. 1 (annotated)

54. Similarly, when the end of the touch occurs as the user's finger is removed from a blade of grass, decay will occur upon removal of the user's finger since the end of contact with the screen and with the blade of grass occurs at the same time, as illustrated below.



APPLE-1004, FIG. 1 (annotated).

55. Further, Hackborn states that “the blades of grass 105 displayed in the area of the screen swiped by the user are caused to bend or *sway* as if contacted by the user's finger during the swipe.” A POSITA would have understood that swaying means moving “back and forth.” For example, the American Heritage Dictionary of the English Language, Fifth Edition (2011) defined “sway” as “[t]o swing back and forth or to and fro.” APPLE-1033, 3. Smith ignores this fact when asserting that “Hackborn does not discuss the animation motion that occurs after the dragging finger is no longer touching the grass,” which would occur after the finger is no longer touching the grass, not during the touch, as indicated by Smith. APPLE-1004, [0028]; POR, 39.

56. Additionally, as described in §III.A, Townsend is not limited to movement of whole objects. For example, Townsend explains that “the application may define the elasticity of an object.” APPLE-1006, [0042]. Because Townsend describes elasticity, which is the “property of certain materials that enables them to return to their original dimensions after an applied []stress has been removed,” a POSITA would have understood that Townsend’s teachings are not limited to the movement of whole objects. APPLE-1034, 3. Thus, Smith’s additional arguments, which rest on the incorrect assumption that Townsend is limited to movement of whole objects, are incorrect. POR, 38-41.

57. For these reasons, claims 5, 8, 27, and 30 are obvious. Pet., §§IV.B.5, 10; POR, 41.

58. In addition, claims 5 and 27 require that the decay occur “following detection of a cessation of the first contact,” while claim 8 and 30 require that decay occurs “in response to detecting a cessation of the first input.” APPLE-1001, claims 5, 8, 27, 30. A POSITA would have understood that, even for blades of grass not at the edge of the touch, at least in some instances, swaying with decay would continue following cessation of the contact, even when the decay does not immediately follow cessation of the touch, thus rendering obvious

“decays following detection of a cessation of the first contact.” At least for this additional reason, claims 5 and 27 are obvious.

C. Claims 9, 21, 31, and 43 Are Obvious

59. As described in §III.A, Townsend simulates friction. For example, Townsend writes that “to move naturally, objects should also exhibit physical characteristics such as elasticity and deceleration” and “slow[] down over time as the object decelerates.” APPLE-1006, [0016]. Townsend defines a “friction coefficient” that “determine[s] how an object decelerates.” APPLE-1006, [0041]. A POSITA would have understood that a decelerating object (e.g., as the result of friction) will come to rest. Therefore, Smith’s assertion that “Townsend’s primary function is to continue moving an object,” is contradicted by Townsend’s disclosures of deceleration and friction. POR, 42.

60. Hackborn additionally describes grass that sways. APPLE-1004, [0028]. A POSITA would have understood that the application of an inertial system with elasticity and friction, e.g., Townsend’s “inertia system [that] provides more realistic movement for application objects,” and includes frictional deceleration, to Hackborn’s swaying grass would, in some instances, result in the grass returning (reverting) to its original position once swaying completes. Pet. §IV.B.2; APPLE-1004, [0028]; APPLE-1006, Abstract, [0016], [0041]. (As I

described above, elasticity is the “property of certain materials that enables them to return to their original dimensions after an applied []stress has been removed.”

APPLE-1034, 3.) Therefore, Hackborn-Westerman-Townsend renders obvious 9, 31.

61. Further, a POSITA would have understood or found obvious that there are only three options – the grass returns to its starting position, the grass ends at a previously encountered position and the grass ends at a position not previously encountered – each of which would occur in some instances. Therefore, at least in some instances, the grass would not return exactly to its original starting position, but rather return to a previously encountered location. In such cases, the system reverts to an image other than its original image, so Hackborn-Westerman-Townsend renders obvious 21, 43.

D. Claim 22 Is Obvious

62. Claim 22 depends on claim 21 and was inadvertently listed in Ground 1A and should instead have been included in Ground 1B, which included claim 21, but it is apparent from the analysis of claim 21 in my declaration and from my analysis of claim 22, that claim 22 is obvious. I have updated my Overview of Conclusions Formed above, accordingly.

E. Claims 4-5, 8-9, 21, 26-27, 30-31, and 43 Are Obvious

63. Smith offers no independent argument regarding these claims. POR, 45. Because claims 1 and 23 are obvious, these dependent claims are also obvious. *See* §II.B, *supra*.

VIII. Hackborn-Westerman-Jablonski renders obvious claim 16 (Ground 1C)

64. As described in §II.A, *supra*, a POSITA would have been motivated to combine Hackborn and Westerman. Further, a POSITA would have been motivated and found obvious combining Hackborn-Westerman with Jablonski since it was well-known that “[w]allpaper images are usually included as part of the computer’s operating system.” APPLE-1008, 1:34-40; POR, 46; Pet., §§IV.C.1-3; APPLE-1003, ¶¶131-134.

IX. Hackborn-Westerman-Jobs renders obvious claims 18-19 and 39-40 (Ground 1D)

A. Smith’s argument concerning motivation to combine mischaracterizes Jobs

65. HWJD includes a lock screen with a live wallpaper, “provid[ing] updated information, altered aesthetics, a change of theme, environment or pace, or a diversion from the status quo,” per Hackborn. Pet., 59 (citing APPLE-1004, [0026]); APPLE-1003, ¶140. Thus, as Smith acknowledges, “the device maintains the user-interface lock state if the detected contact does not correspond to the

predefined gesture,” which “saves battery power by ensuring that the device is not accidentally awakened.” APPLE-1009, [0177]; POR, 47.

66. Smith alleges that including wallpaper on a lock screen is “rooted in hindsight.” POR, 46. However, Hackborn broadly teaches “wallpaper need not be a static image, but can be active and may execute code so as to produce interesting and compelling user interface examples.” APPLE-1004, [0034]. Therefore, the Hackborn-Westerman-Jobs combination is not hindsight but rather a straightforward application of Hackborn’s express teaching.

67. Smith further states that live wallpaper “permits unintended or unauthorized user input and processor activity that can drain battery or trigger unnecessary actions.” POR, 47. However, as Smith also notes, “live wallpaper is implemented in a distinct process.” POR, 58. A POSITA would have understood that executing the live wallpaper “distinct process” consumes battery regardless of whether it executes on the home screen or a lock screen. Whether on a lock screen or home screen, a user selecting live wallpaper instead of static wallpaper is choosing to benefit from “updated information, altered aesthetics, a change of theme, environment or pace, or a diversion from the status quo” in exchange for some additional battery use. APPLE-1004, [0026]. Additionally, the lock screen reduces battery use by performing its primary function: the device will not unintentionally transition to the home screen so processes supporting the home

screen will not execute when the lock screen is active (thereby saving battery).
APPLE-1009, [0177].

68. As Smith notes, a lock screen also “prevent[s] ‘unintentional or unauthorized use of the device ... or activation or deactivation of functions.’” POR, 47 (citing APPLE-1009, [0177]; APPLE-1010, [0049]). Using live wallpaper does not alter this benefit since functions other than interacting with the wallpaper and unlocking the device are unavailable on the lock screen.

B. Claims 18 and 39 Are Obvious

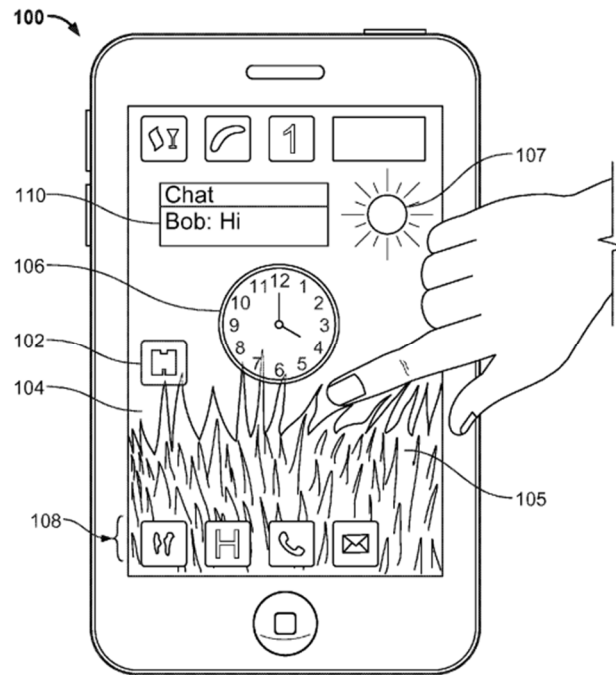
69. Smith’s arguments concerning claims 18 and 39 are based on an overly strict interpretation of the Petition’s mapping to claim 1. Ground 1A’s discussion of the display of one or more foreground objects, as it relates to [1.h] offers exemplary foreground objects in illustrating that the prior art combination displays such foreground objects. Pet., 18-19. These examples are not limiting, however. Contrary to Patent Owner’s assertion (POR, 48), Petitioner clearly explains that, in the HWJD, example foreground objects within the lockscreen interface include the “unlock image 302.” Pet., 59.

70. Patent Owner also asserts that the petition did not “indicate that the foreground objects identified in Hackborn would exist in the lock screen interface of Jobs.” Pet., 59. However, claims 18 and 39 merely add limitations requiring that the first user interface includes a lockscreen; they do not require that the

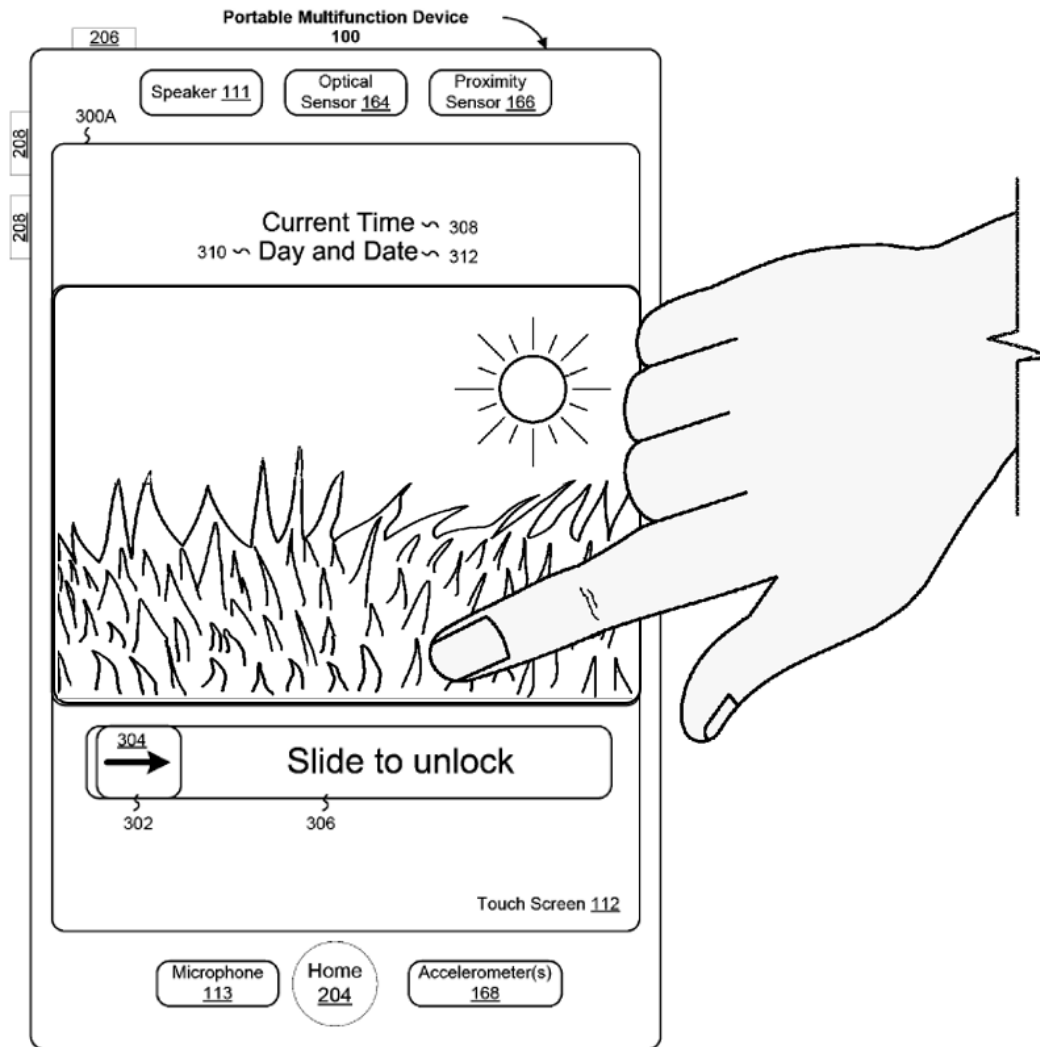
foreground objects of limitations 1.h and 23.g are present within the lockscreen user interface screen. A POSITA would understand that a user interface, such as “the first user interface” recited in the claims of the ’755 patent can include a multitude of different displays that correspond with different aspects of a device’s functionality. Indeed, the background to Jobs (which is incorporated by reference into the ’755 patent) refers to the significant challenge of designing “*a user interface* that allows users to easily interact with a multifunction device” because “*the user interface* is the gateway through which users receive not only content but also responses to user actions or behaviors, including user attempts to access a device’s features, tools, and functions.” APPLE-1009, 1:58-66.

71. Specifically, HWJD includes a first user interface that includes a home screen and a lock screen. For example, per Hackborn HWJD includes “a home screen [that] includes a background, which may ... include an image in the form of wallpaper.” Pet. §IV.A.4[1.g] (citing APPLE-1004, [0025]). Further, “HWJD has a lock screen as a first interface and the lock screen includes a wallpaper, per Jobs, which is ‘live,’ per Hackborn.” Pet. §IV.D.3[18], (citing APPLE-1003, ¶141; APPLE-1004, [0028], FIG. 1; APPLE-1009, FIG. 3A; Pet. §IV.D.2). Since HWJD’s user interface (*first user interface*) includes two “screens” (home screen and lock screen), the Petition’s treatment of claims 1 and 18 is consistent. Thus, HWJD’s user interface, including both a home screen and a

lock screen, renders obvious “the electronic device is configured such that the first user interface includes a lock screen.”



HWJD Home Screen. APPLE-1004 (Hackborn), FIG. 1; APPLE-1003, ¶47.



HWJD Lock Screen. APPLE-1009, FIG. 3A (modified with APPLE-1004, FIG. 1); APPLE-1003, ¶40.

72. Moreover, the Petition explains that the HWJD includes a lockscreen having a wallpaper, per Hackborn. Pet., 59. Given that Hackborn teaches that its wallpaper is in the background (*see* APPLE-1004, FIG. 2, showing the wallpaper 104 as the rear-most layer), a POSITA would have understood that the wallpaper in HWJD is similarly in the background relative to the other content displayed on

the HWJD, per Hackborn. *see* APPLE-1032, 61:15-64:4 (describing Hackborn’s wallpaper as being in the background).

C. Claims 19 and 40 Are Obvious

73. Smith argues that, “in pointing to the unlocked lock screen interface of Jobs instead of the interface of Hackborn, Petitioner fails to show that the Hackborn-Westerman-Jobs combination discloses the required ‘background with an appearance’ and ‘one or more foreground objects’ of claim 19.” POR, 50-51. In contrast, as I described in reference to claims 18 and 39, HWJD includes a user interface that includes a home screen and a lock screen. Therefore, as described in §V.B, Smith’s argument willfully ignores the combination’s background with an appearance (the live wallpaper) and the foreground objects of HWJD. Pet., §§IV.A.3[1.g], IV.A.3[1.h]. Thus, claims 19 and 40 are obvious.

X. Hackborn2-Westerman-Jobs Renders Obvious claims 1, 4–8, 10–12, 15, 17–20, 23, 26–30, 32, 34, and 37–42 (Ground 2)

A. A POSITA would have been motivated to combine Hackborn2-Westerman-Jobs

1. Jobs provides an obvious solution to Hackborn’s obscured display of messages

74. Hackborn lists multiple components that can be included in live wallpaper, including animated grass, content from a social networking site, and weather, explaining that “live wallpaper can include a combination of the

described wallpaper examples.” APPLE-1004, [0028], [0045]-[0046], [0050], FIG. 6 Thus, a POSITA would have found obvious a composite live wallpaper that includes, for example, social media feeds and animated grass. APPLE-1003, §IV.D.2. In the combination, a user can use a swipe input to scroll back to view content (e.g., social media posts) that have automatically scrolled off the display. Pet., 68-71.

75. While Smith alleges that “Hackborn already provides a way for a user to view past posts—i.e., by opening a social media application with which posts are associated” (POR, 54), as Dr. Cockburn explains, a user “may not want to open up the application. It could be inconvenient. Whereas a quick glance [in a live feed] might tell them if an important message from a boss or colleague that they had been awaiting has arrived or not.” EX2007, 100:1-11. Dr. Cockburn’s testimony clarifies the Petition’s motivation—“to provide a way to view older posts (e.g., partially-displayed post 606e) that s/he may not have already read before the posts were moved downward and less (or not visible)” and to “view[] the images/posts at his/her leisure” through manual scrolling. Pet., 66, 71; *see* EX2007, 101:14-18 (“***I rely on my understanding and experience of over 30 years in the field.*** I think any POSITA would understand that information that the user wants to look at that suddenly disappears while they are just beginning to look at it would be an infuriating experience.”). As the Petition further confirms, the

manual scrolling techniques described in Jobs were well known by the Critical Date. Pet., 66-67. Since the older posts would have been automatically scrolled off the feed in the live wallpaper, a POSITA would have found it obvious to use a well-known technique (manual scrolling, per Jobs) to bring those posts back into view. Pet., 66-71; APPLE-1003, ¶¶148-155. Indeed, “Jobs describes precisely the same manual scrolling of messages” discussed above that would address the otherwise “infuriating experience” for the user, thus connecting the general obviousness of manual scrolling “to the specific context of Hackborn’s wallpaper” (e.g., social media feed messages). Pet., 67; APPLE-1009, [0243], FIG. 6A; *see* POR, 55. Thus, the combination’s support has, not an air of *truthiness*, but rather, truthfulness, as supported by Hackborn’s teachings (e.g., displaying obscured post 606e that has largely scrolled out of view) and Jobs’s teaching of a well-known method for bringing content that has scrolled off the display back into display.

76. Smith claims that, since a user could open an application to view older posts, scrolling would be unnecessary. POR, 54-55. Smith appears to contend that if one mechanism exists to accomplish a task, a user interface should provide no alternate mechanism, regardless of how much effort an alternate mechanism would save. Smith’s reasoning belies common sense and reality. Word processing applications offered (and continue to offer) multiple methods for saving a document (e.g., control-S”, clicking a “save” icon, or selecting a menu option).

Hyperlinks provide a simpler method for accessing a website while manually typing a URL is also an option, though often cumbersome. Thus, Smith's contention is contradicted by long-standing user interface principles. Indeed, contrary to Smith's allegation that Petitioner does not provide a purported advantage (POR, 59), the combination in fact offers a convenient and intuitive solution for quickly viewing a post that has automatically scrolled completely or partially off the display as compared to the more cumbersome requirement of opening a dedicated application.

2. Hackborn's wallpaper is in the background relative to foreground objects

77. Hackborn explains that “[t]he various objects that are part of a home screen may be segregated into various display layers, with some layers appearing in front of other layers,” where “a home page generally has a back-most layer that fills substantially all of the display and acts as a background.” APPLE-1004, [0005]. “[O]pen applications may be shown in a visual layer that is even farther in front of the layer for the icons, so that when an application is maximized, none of the other two layers is shown” and “[i]n various implementations, there can be multiple application layers. APPLE-1004, [0025], [0047]. Hackborn explicitly teaches that its device can have more than two visual display layers. APPLE-1004, [0029]-[0031], FIG. 2.; APPLE-1032, 64:5-15 (“I do not see any disclosure that would limit the number of layers as disclosed in Hackborn”).

78. Smith highlights Hackborn’s disclosure that “display planes may be adjusted based on certain inputs or information received” arguing that such an adjustment of the display plane of a wallpaper may “cause it to assume a more prominent display position” so that the wallpaper was moved “‘upward’ to a plane above that of the icons.” POR, 56 (quoting APPLE-1004, [0048]). This argument is flawed for several reasons. First, Smith’s argument is based on the assumption that Hackborn *requires* this movement of wallpaper, which Hackborn does not. APPLE-1004, [0048] (using the permissive language “may”). Indeed, the example scenarios where the wallpaper in Hackborn assumes a more prominent display generally involve situations where the user *actively interacts with its content*, for example, by typing a response or launching an application, rather than simply viewing content. *Id.* Second, Smith’s argument assumes that, when the wallpaper moves from one display layer to another, the wallpaper necessarily moves to the forward-most plane (i.e., in front of the icons, but, again Hackborn does not require this. *Id.* (describing a “more prominent display position,” not the *most prominent display position*.). Indeed, in the example shown in FIG. 2 of Hackborn, the wallpaper 104 could simply move from layer¹ 1 to layer 2, while still being in the

¹ Figure 2 of Hackborn references processes, which are understood as layers.

APPLE-1004, [0029].

background relative to, for example, foreground object application 110, in layer 3. Alternatively, the device could include four display layers, such that the wallpaper 104 moved from layer 0 to layer 1 and remains in the background relative to foreground objection application 110 and icons 102 and 106.

3. Smith's arguments concerning the alleged technical limitations of Hackborn's system are technically flawed

79. Computing systems typically include dozens or hundreds of independently executing processes that can communicate with other processes using well-known techniques such as sockets, events and shared memory. While Smith asserts that “Petitioner fails to address the technical limitations of Hackborn’s system that would have made manual scrolling unworkable for Hackborn’s wallpaper,” including that “Hackborn discloses that its live wallpaper is implemented in a distinct process” (POR, 58), no such limitations or “technical complexities” exist. For example, a POSITA would have understood that, to the extent various user interface elements needed to communicate, or that data relating to a touch was required by multiple user interface elements, well-known techniques were available. Moreover, where Smith alleges that Hackborn’s distinct process for implementing the live wallpaper would need significant modification, it offers no concrete support that significant modifications are in fact

needed. *See* POR, 58-59. Indeed, the opposite is true; a POSITA at the 2011 priority date would be aware of standard user interface widgets for constructing scrolling views that support both automatic and manual scrolling. As one example, I note that an online Android Developer's guide in 2011 described a ScrollView class that included functions "scrollTo" (for automatic scrolling) and "onTouchEvent" (for manual scrolling). APPLE-1035, 2.

4. Westerman's teachings are clearly related to Hackborn and Jobs.

80. As discussed in the Petition regarding Ground 2, "a POSITA reviewing Hackborn would have looked to Westerman for implementation details for how to discern between different types of user inputs (e.g., tap or swipe)," including using "predetermined thresholds." Pet., 63. For all the reasons discussed above for Ground 1A, a POSITA would have been motivated to combine the teachings of Hackborn and Westerman. §II.A. A POSITA would have further found obvious the use of manual scrolling, per Jobs, to permit a user to view content that had automatically been scrolled off the display, as discussed above. Pet., 66-72.

81. Hackborn discloses the receipt of both swipes and taps (APPLE-1004, [0028]), and as discussed in §II.A.2, Hackborn therefore must distinguish between swipes and taps. More, as Smith acknowledges, Jobs also teaches the receipt of both taps and swipes. POR, 60. Jobs is explicit in the need to distinguish taps

from swipes since “a swipe gesture that sweeps over an application icon may not select the corresponding application when the gesture corresponding to selection is a tap.” APPLE-1009, [0164]. Jobs’s statement contradicts Smith’s contention that “Jobs teaches the receipt of ‘taps’ but distinguishes them spatially rather than via thresholds.” POR, 60. In Jobs, a tap and swipe can occur at the same location (on an application icon) and thus cannot be distinguished spatially, as Smith incorrectly contends. APPLE-1009, [0164]. Since taps and swipes cannot be distinguished spatially (and because Hackborn is silent about these implementation details), a POSITA would have looked to references such as Westerman. APPLE-1003, §§VII.A.3, VII.E.1.

B. Claims 1 and 23 Are Obvious

82. H2WJD² determines whether a gesture is a swipe or a tap (*see* §II.B) and performs the action assigned to the gesture in a particular context. APPLE-1009, [0164] (“a swipe gesture that sweeps over an application icon may not select the corresponding application when the gesture corresponding to selection is a

² This alternative combination of Hackborn, Westerman, and Jobs, which focuses on a specific embodiment of live wallpaper in Hackborn is referred to herein as Hackborn2-Westerman-Jobs, H2WJ, or the H2WJ device (“H2WJD”), to avoid confusion with Ground 1D. Pet., §IV.E.1, n 4.

tap”), [0243] (“a user can scroll through the message conversation (comprised of messages 604 and 606) by applying a vertical swipe gesture”). Thus, Jobs relies on the distinction between a tap and swipe since, for example, a swipe scrolls messages and a tap does not. APPLE-1009, [0243]. Contrary to Smith’s assertion that “Westerman’s binary distinction between a ‘tap’ and a ‘swipe’ has no role in Jobs’ vertical scrolling” because “Jobs does not rely on the distinction between a swipe and a tap to initiate its vertical scroll” (POR, 62-63), in fact, such a gesture determination is required since swipes, not taps, cause scrolling. Therefore, since swipes are distinguished based on a magnitude exceeding a threshold, the dynamic changes of appearance of the background (the feed scrolling) occurs when the threshold is exceeded (i.e., the gesture is a swipe, not tap). APPLE-1003, ¶¶52-53.

83. Thus, claims 1 and 23 are obvious.

C. Claims 7 and 29 Are Obvious

84. For at least the same reasons as discussed above regarding Ground 1A, contrary to Smith’s assertions, H2WJD scrolls the feed in response to a swipe, not a tap. *See* §II.C; Pet., 79-80. Indeed, “Hackborn teaches the use of live wallpapers that can be caused to change their appearance *in response to a user input (e.g., swipe)*.” APPLE-1003, ¶145. However, a tap, which would be differentiated from a swipe in H2WJD using a swipe threshold, “does not suggest

the same scrolling output” on the wallpaper feed. APPLE-1003, ¶176; *see* POR, 63.

85. While Hackborn explains that selection of “the wallpaper or a portion of the wallpaper” *may* “cause the wallpaper or portion thereof to assume a more prominent display position or status,” such behavior of the wallpaper is permissive and not required, based on the use of the word “may.” APPLE-1004, [0048]. Moreover, Smith’s reliance on Westerman’s and Job’s teachings relating to the functions responsive to a tap are irrelevant because H2WJD’s response to a tap is based on Hackborn, not on portions of the secondary references not relied on for the combination.

D. Claims 18-19 and 39-40 Are Obvious

86. For the same reasons as discussed in §V, claims 18-19 and 39-40 are obvious.

E. Claim 28 Is Obvious

87. In H2WJD, the dynamic change in the appearance of the background is independent of the location that corresponds to the background. Pet., §§IV.E.5, IV.E.20; APPLE-1003, ¶¶175, 204. For example, Jobs states the movement of a finger “on the touch screen display” causes the “list of items displayed on the touch screen display [to] scroll[.]” APPLE-1009, [1137]-[1138]. Thus, a POSITA

would have understood that the scrolling gesture can occur at any location on the live wallpaper. APPLE-1009, [1137]-[1138]; APPLE-1003, ¶¶175, 204.

88. Smith mischaracterizes Petitioner’s position by stating that “Petitioner admits [the gesture] occurs ‘within the message list’ that represents the dynamic change of the background.” POR, 66. In fact, as described above, Petitioner made no such admission, stating instead that while a gesture in the message list is an option, the gesture can occur *at any location* on the live wallpaper and is thus independent of the location that corresponds to the background. Pet. §IV.E.5[6]; APPLE-1003, ¶175.

F. Dependent claims 4-8, 10-12, 15, 17-20, 26-30, 32, 34 and 37-42 Are Obvious

89. Smith offers no independent argument regarding claims 4-8, 10-12, 15, 17-20, 26-30, 32, 34 and 37-42. POR, 67. Because claims 1 and 23 are obvious, these dependent claims are also obvious. *See* §II.B, *supra*.

XI. CONCLUSION

I declare that all statements made in this Declaration of my own knowledge are true and that all statements made on information and belief are believed to be true. I further declare that these statements are 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).

Executed this 2nd day of August, 2025.

A handwritten signature in black ink, appearing to read "Andrew Cockburn", written in a cursive style.

Andrew Cockburn