

APPLE INC. v. SMITH INTERFACE TECHNOLOGIES, LLC

Case IPR2024-01087

Patent Owner's Hearing Demonstratives

October 16, 2025

Technology Overview

Ground 1A (Hackborn-Westerman)

Ground 1B (Hackborn-Westerman-Townsend)

Ground 1D (Hackborn-Westerman-Jobs)

Ground 2 (Hackborn-Westerman-Jobs)

Technology Overview

Ground 1A (Hackborn-Westerman)

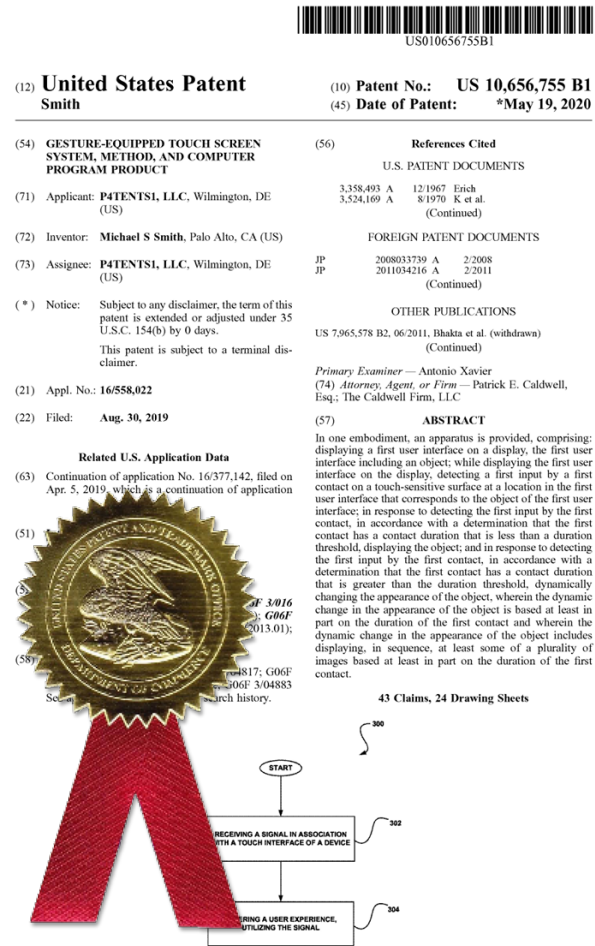
Ground 1B (Hackborn-Westerman-Townsend)

Ground 1D (Hackborn-Westerman-Jobs)

Ground 2 (Hackborn-Westerman-Jobs)

U.S. Patent No. 10,656,755

U.S. Patent No. 10,656,755



(12) **United States Patent**
Smith

**(54) GESTURE-EQUIPPED
TOUCH SCREEN SYSTEM,
METHOD, AND COMPUTER
PROGRAM PRODUCT**

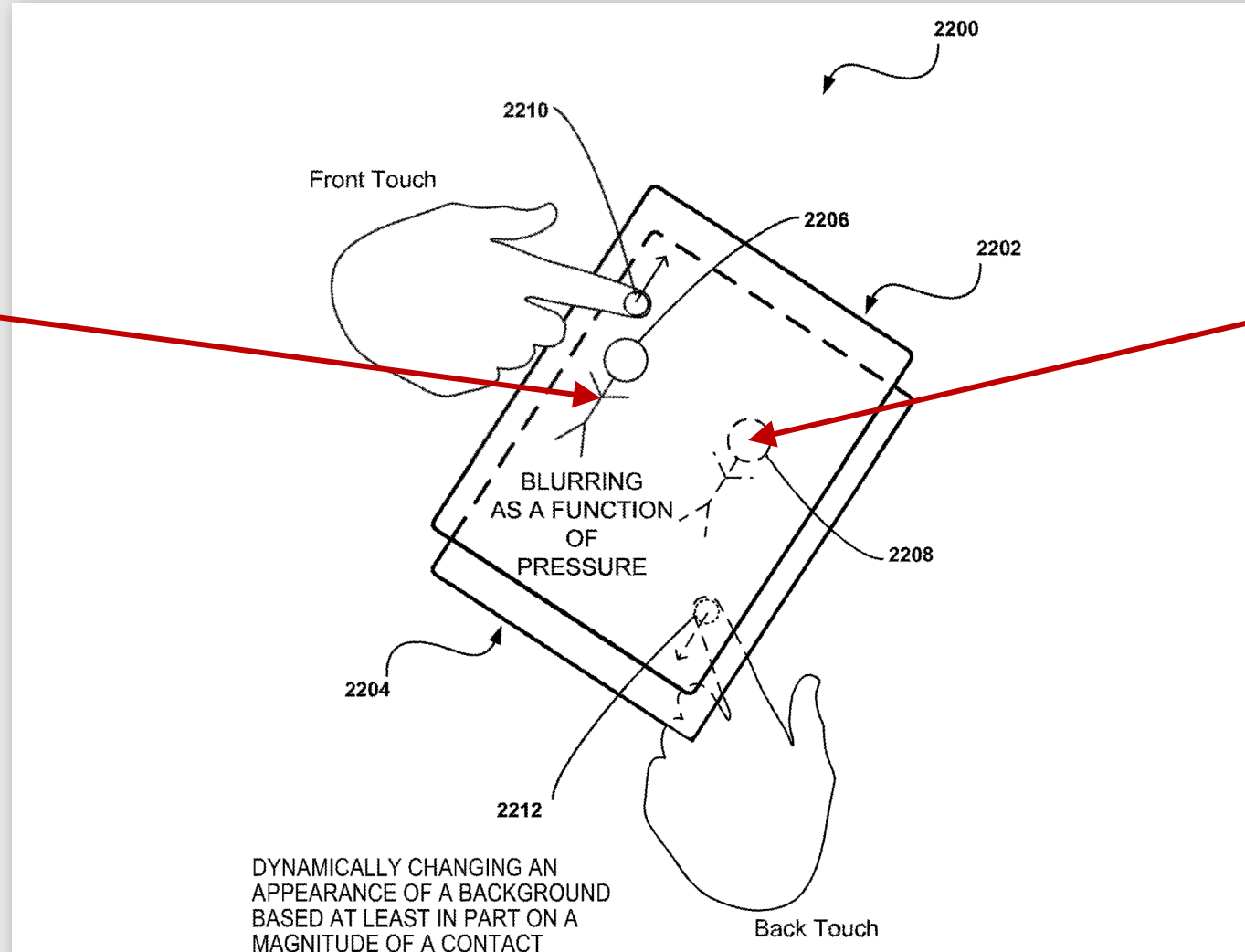
(45) Date of Patent: May 19, 2020

(22) Filed: Aug. 30, 2019

Technology Overview

Foreground

Background



Independent Claim 1 (and Claim 23)

Claim 1

1. An electronic device comprising:

...

[1.g] a background with an appearance, and

[1.h] one or more foreground objects;

[1.i] while displaying the first user interface on the display, detecting a first input by a first contact on the touch-sensitive surface at a location in the first user interface that corresponds to the background of the first user interface; and

[1.j] in response to detecting the first input by the first contact, in accordance with a determination that the first contact has a magnitude that is above a threshold, dynamically changing the appearance of the background of the first user interface without changing an appearance of the one or more foreground objects in the first user interface,

[1.k] wherein the dynamic change in the appearance of the background of the first user interface is based at least in part on the magnitude of the first contact and

[1.l] wherein the dynamic change in the appearance of the background of the first user interface includes displaying in sequence at least some of a plurality of images based at least in part on the magnitude of the first contact.

Technology Overview

Ground 1A (Hackborn-Westerman)

Ground 1B (Hackborn-Westerman-Townsend)

Ground 1D (Hackborn-Westerman-Jobs)

Ground 2 (Hackborn-Westerman-Jobs)

Hackborn



Hackborn's Live Grass Wallpaper

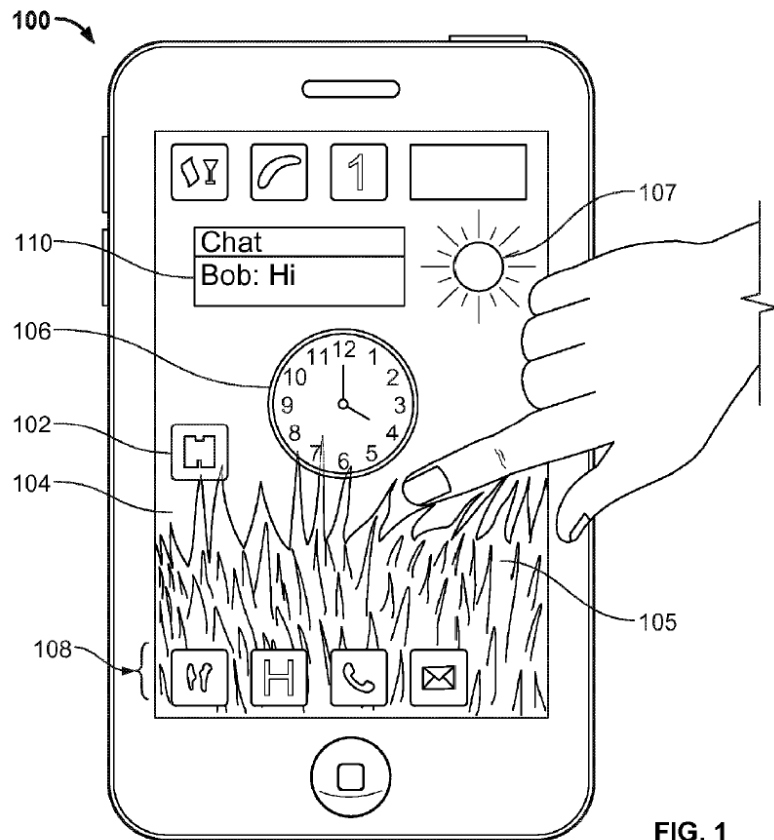


FIG. 1

EX1004, FIG. 1



Responsive to Multiple Inputs

“A general home screen layout is shown in FIG. 1 ... the wallpaper **104** in this example may instead be an object that includes executable code so that the wallpaper may be active, and **in this example may respond to inputs** from a user of the computing device or otherwise change in response to received information from the user or from another computing device.”



EX1004, [0026] (cited in POR, 30)

Hackborn



Hackborn's First Mode

- “[I]n a first mode, **user input** on a touchscreen may be interpreted as being directed to icons displayed on a layer over the wallpaper.”
- “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.”

EX1004, [0028]-[0029] (Cited in POR, 9)



Hackborn's Second mode

- “[I]n another mode ... **user input** may be interpreted as being directed to items displayed on the wallpaper.”
- The “wallpaper may not be immediately responsive to user input ... but may become responsive to direct user input only after a predetermined user input is received by the device”
- **Predetermined inputs can include** shaking the device, selecting an icon, button, or area of the display screen (e.g., a corner of the screen) reserved for activating the live wallpaper, **making a particular movement across the display screen, tapping on the display screen a predetermined number of times within a predetermined time period, etc.**

EX1004, [0028] (Cited in POR, 9)

Westerman



Westerman's Alternative Gesture

“To provide more convenient use of certain keys, for example, erasing and basic punctuation insertion, directional swipes (also referred to herein as “swipe gestures”) over the alphabetic keys can be used as an **alternative to striking certain keys**”

EX1005, [0045] (cited in POR, 14)



Westerman's Swipe Gesture Determination

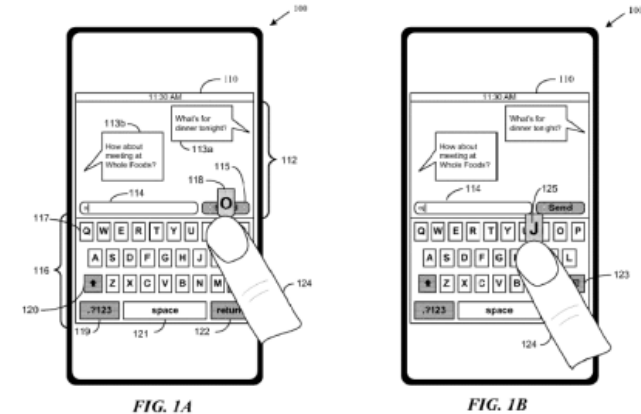


FIG. 1A

FIG. 1B

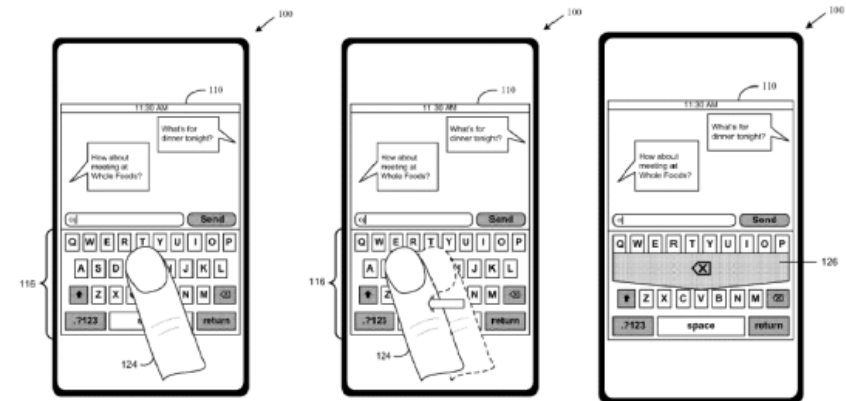


FIG. 2A

FIG. 2B

FIG. 2C

EX1005, FIGs. 1-2 (cited in POR, 13-14)

Westerman



Westerman's Input Performs Alternative Functions

"If the motion exceeds the minimum swipe length threshold (block 1007), a second test can be performed to determine whether the time of the motion is less than a swipe gesture timeout (block 1009)." "If the time of the motion is greater than the swipe gesture timeout threshold, i.e., took too long to be a swipe gesture, the event is interpreted as a key tap."

"Alternatively, if the path has been determined to exceed the minimum length threshold for a swipe gesture (block 1007) and has been determined to be less than the maximum time threshold for a swipe gesture threshold (block 1009), the path can be interpreted as a swipe event"



Westerman's Swipe Gesture Determination

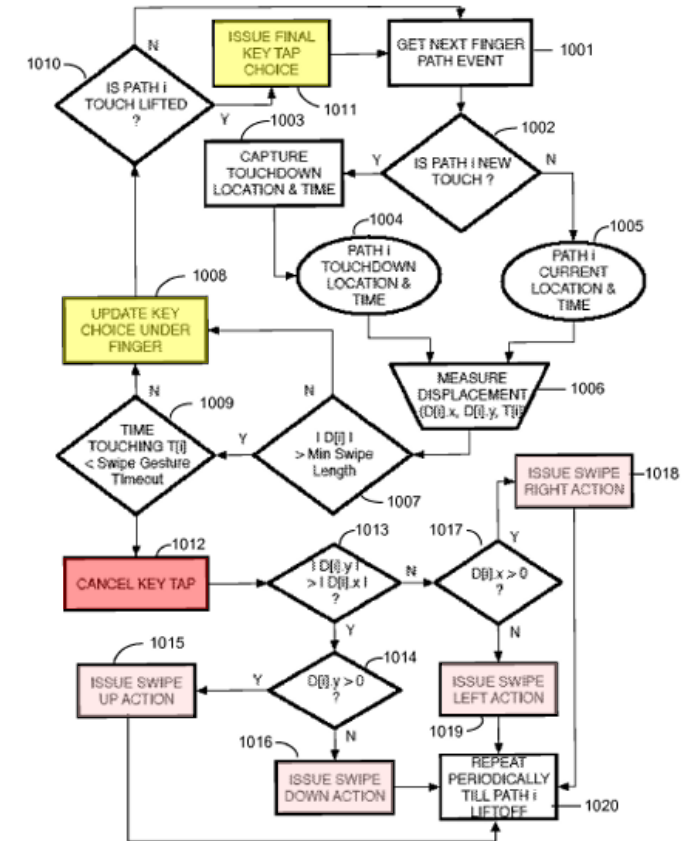


FIG. 10

EX1005, [0062], [0064] (cited in POR, 23)

EX1005, FIG. 10

Ground 1A: Hackborn + Westerman



Hackborn's Live Grass Wallpaper

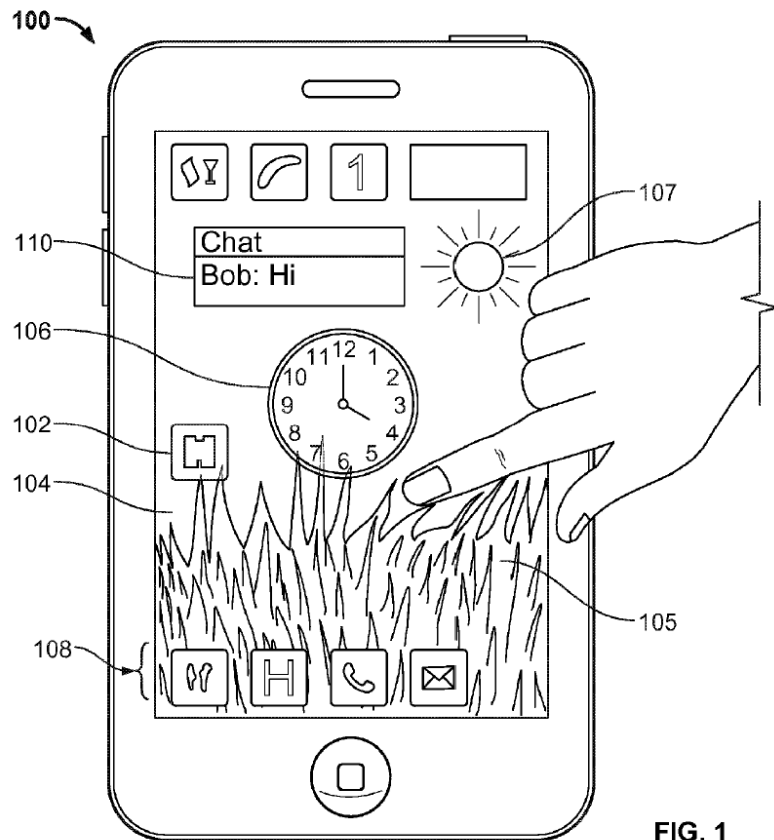


FIG. 1

Pet, 9–12 (citing EX1004, FIG. 1)



Westerman's Swipe Gesture Determination

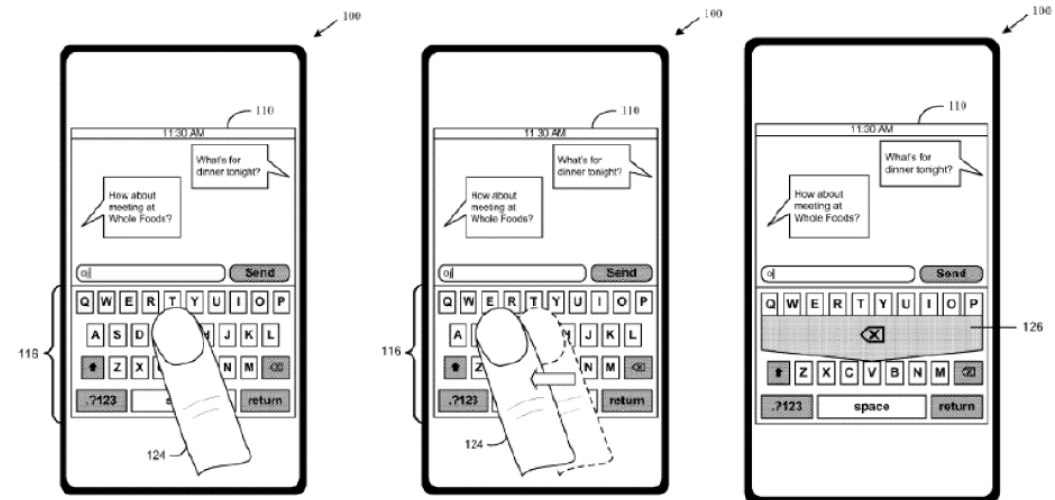


FIG. 2A

FIG. 2B

FIG. 2C

Pet, 12–14; EX1005, FIG. 2 (cited in POR, 13–14)

Ground 1A: No Motivation to Combine

Petition's motivation is predicated on the assumption that Hackborn's live wallpaper needs to distinguish between taps and swipes



"To the extent Hackborn lacks details on how to distinguish tap from swipe inputs, a POSITA would have naturally looked to other prior art teachings that discuss 'interpreting manual swipe gestures as input in connection with touch-screen keyboards,' such as Westerman."

Pet., 12



"A POSITA reviewing Hackborn would have naturally 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)." "Since Hackborn explains that its device can register both swipes and taps, a POSITA would have found it obvious to implement Hackborn with methods ... for distinguishing between tap and swipe gestures (e.g., using 'predetermined thresholds')."

Pet., 13



"Smith's allegation ... ignores the fact that Hackborn's wallpaper reacts to swipes and not to taps, thus necessitating distinguishing between the gestures."

Reply, 3

Ground 1A: No Motivation to Combine

Petitioner's assumption relies on alleged disclosure that taps on Hackborn's wallpaper are non-functional



"If the input on the wallpaper is a swipe, the grass is animated responsive to the swipe; if the input is a tap, the wallpaper does not animate. Pet., 20-23."

[Reply, 4 \(citing EX1004, \[0028\]\)](#)



"Contrary to Smith's assertion, Hackborn's device must distinguish between swipes and taps because the device responds differently to each."

[Reply, 2](#)



"the HWD identifies the gesture as a tap, and not a swipe, so the background remains unchanged."

[Pet., 32](#)



"animating grass based on taps introduces technical challenges Hackborn does not address."

[Reply, 5](#)

Ground 1A: No Motivation to Combine

Hackborn's FIG. 1 example is not limited to swipes



Hackborn's Live Grass Wallpaper

"In a second general aspect ... [t]he method also includes receiving user input on the display, and communicating to the first process data reflecting the user input. The method further includes producing an animated moving display of the graphical wallpaper representation in response to the user input on the display" (EX1004, [0009] (cited in POR, 6))



Hackborn's Goal

"[G]enerate an animation that makes the grass blades look as if the finger is actually contacting them"

(EX1004, [0033] (cited in POR, 25))



Hackborn Grass Wallpaper Example

"In the example shown in FIG. 1, a user is swiping her finger across a touch-sensitive display screen of the computing device. In 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." (EX1004, [0028])

"[T]he wallpaper 104 in [the FIG. 1] example may instead be an object that includes executable code so that the wallpaper may be active, and in this example may respond to inputs from a user" (EX1004, [0026])

Cited in POR, 15

Ground 1A: No Motivation to Combine

Hackborn does not exclude taps as inputs for using its live wallpaper



Hackborn [0028]

“In the example shown in FIG. 1, a user is swiping her finger across a touch-sensitive display screen of the computing device. In 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. Other examples of live wallpaper may not be immediately responsive to user input on the screen of the device. Rather, some examples of live wallpaper may be displayed and updated so that an appearance of the wallpaper is changed, but may become responsive to direct user input only after a predetermined user input is received by the device. Examples of predetermined user inputs that may be received by the device to cause the live wallpaper to become responsive to user input can include agitating or shaking the device, selecting an icon, button (not shown in FIG. 1), or area of the display screen (e.g., a corner of the screen) reserved for activating the live wallpaper, making a particular movement on or across the display screen, tapping on the display screen a predetermined number of times within a predetermined time period, and others. Thus, in a first mode, user input on a touchscreen may be interpreted as being directed to icons displayed on a layer over the wallpaper, and in another mode (which can be switched to using the techniques just described), user input may be interpreted as being directed to items displayed on the wallpaper.”

Ground 1A: No Motivation to Combine

Hackborn does not exclude taps as inputs for using its live wallpaper



Hackborn's mode-switching inputs exclude a single tap on the wallpaper

Predetermined user inputs can include:

- agitating or shaking the device,
- selecting an icon, button (not shown in FIG. 1), or area of the display screen (e.g., a corner of the screen) reserved for activating the live wallpaper,
- making a particular movement on or across the display screen,
- tapping on the display screen a predetermined number of times within a predetermined time period.

EX1004, [0028] (cited in POR, 24-25)



Dr. Mahon Testimony

“Indeed, if Hackborn treated taps differently than swipes and other inputs for its wallpaper, a single tap would have been sufficient to switch mode.”

EX2005, ¶63 (cited in POR, 24-25)

Ground 1A: No Motivation to Combine

Petitioner's other grounds recognize Hackborn's breadth



Petition's Ground 2

Given that Hackborn teaches (1) receiving user input on the background (live wallpaper), (2) causing the background to change appearance responsive to user input,

Pet., 66

Ground 1A: No Motivation to Combine

Dr. Cockburn admits that he expects the grass animation to be realistic, and real-world grass moves when you touch or poke it.



Dr. Cockburn Testimony

Q. Based on Hackborn's disclosure, including its depiction of individual blades moving in Figure 1, what is your expectation of Hackborn's fidelity?

A. I think a person of skill in the art's expectation would be towards the higher end of fidelity as the intention because the intention is to make grass blades look as if the finger is actually contacting them as it drags across the screen.

EX2007, 108:18–109:9 (cited in POR, 25)



Dr. Cockburn Testimony

Q. Does real-world grass move when you touch it?

A. Yes. The purpose here is to make the grass blades look as if the finger is actually contacting them as it drags across the screen.

...

Q. All right. And what if you poke a blade of grass and it's going to—poke it away from you, it's going to bend away from you. Correct?

A. In the physical real world, sure.

EX2007, 62:15–17, 63:21–64:2 (cited in POR, 31; Sur-Reply 2)

Ground 1A: No Motivation to Combine

Petitioner's distinguishing theories are incorrect



"Hackborn teaches its device reacts differently depending on the gesture (e.g., tap, swipe)"

Reply, 2



Ground 1A: No Motivation to Combine

Hackborn's gestures are distinguished spatially



Petitioner's Theory

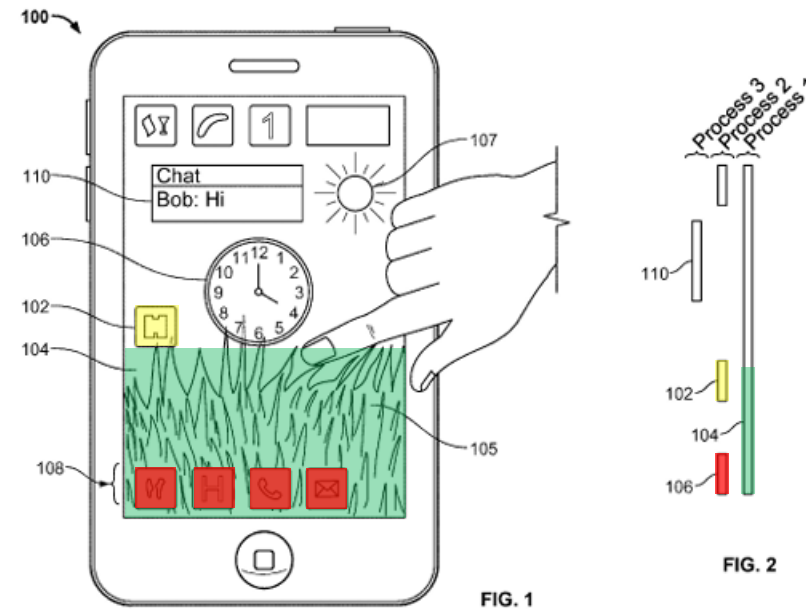
Hackborn teaches animating grass wallpaper responsive to **swipes**, and in other examples, teaches switching the device's mode responsive to "**tapping** on the display screen a predetermined number of times within a predetermined time period." APPLE-1004, [0028].

A POSITA would have understood that icons are selected via **taps**

Therefore, because Hackborn teaches its device reacts differently depending on the gesture (e.g., tap, swipe), Hackborn must distinguish them,



Hackborn



Petitioner's identified gestures are at different locations (i.e., spatially distinct) that allows them to be treated differently. (POR, 9)

Reply, 2

EX1004, FIGs. 1-2

Ground 1A: No Motivation to Combine

Hackborn's gestures are distinguished by mode



Hackborn's First Mode

- “[I]n a first mode, user input on a touchscreen may be interpreted as being directed to icons displayed on a layer over the wallpaper.”
- “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.”

EX1004, [0028]-[0029] (Cited in POR, 9)



Hackborn

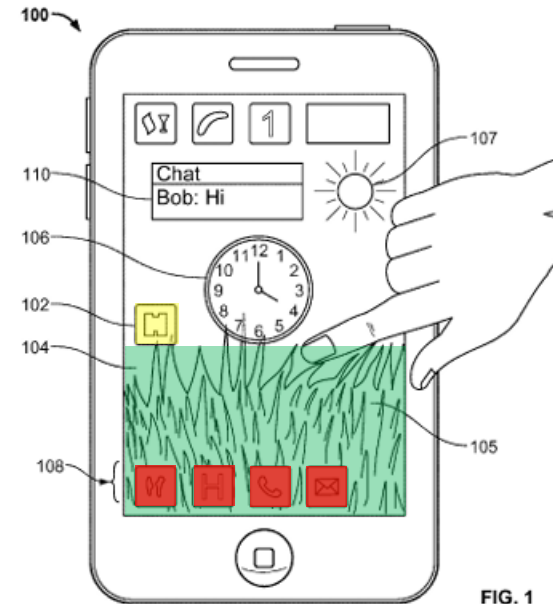


FIG. 1

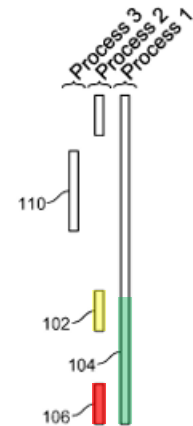


FIG. 2

EX1004, FIGs. 1-2

Ground 1A: No Motivation to Combine

Petitioner's distinguishing theories are incorrect



~~"Hackborn teaches its device reacts differently depending on the gesture (e.g., tap, swipe)"~~

[Reply, 2](#)



Potential conflict because "a tap on the overlapping content could either animate the grass or activate the icon"

[Reply, 6](#)



"

Ground 1A: No Motivation to Combine

There is no “conflict” in Hackborn when grass overlaps the icons



Petitioner's Theory

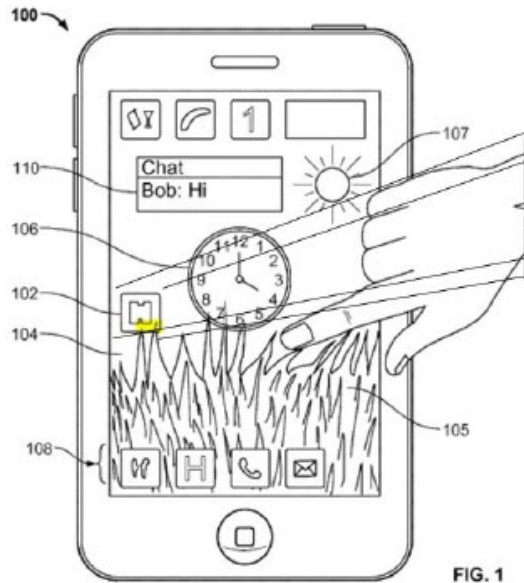


FIG. 1

Hackborn does not contemplate this conflict despite showing grass overlapping an icon (FIG. 1), suggesting that such a conflict does not occur in Hackborn's device.



Hackborn

“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.” (EX1004, [0029])

The four icons 108 appear on top of, or over, the grass 105 of the wallpaper 104. Icon 102, by contrast, is partially transparent so that the portion of the grass 105 behind icon 102 is still displayed, albeit less prominently than the grass 105 that is not behind the icon 102. (EX1004, [0030])

“[A] user may be able to select whether all, some, or particular icons are displayed in a partially transparent manner or in a manner that completely obscures the portion of the wallpaper below the icon.” (EX1004, [0030])

Reply, 6-7

(cited in POR, 9; Sur-reply 3)

Ground 1A: No Motivation to Combine

There is no “conflict” in Hackborn when grass overlaps the icons



Dr. Mahon's Declaration

“Hackborn also offers details of the ‘touch-sensitive display screen,’ in that ‘[a] touch interface 706 may take a familiar form and may interpret input by a user on a touchscreen’ by ‘coordinat[ing] with the display controller 704 to **identify what item or items on a display a user is selecting by touching at a particular location.**’ EX1004, [0054]. Thus, 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.”

EX2005, ¶43 (cited in POR, 10; Sur-Reply, 3)



Hackborn

“Other various effects may also be achieved in a similar manner. For example, if a user presses on an icon 102 or gadget 106, moves it by dragging their finger, and then releases it, the object may send a message to the wallpaper 104 process indicating that it was dropped at a particular location on the screen. The wallpaper object may then be programmed to produce an animation that looks like rippling water emanating away from the icon or gadget where it was dropped by the user.”

EX1004, [0034] (cited in Sur-Reply, 3)

Ground 1A: No Motivation to Combine

Petitioner's distinguishing theories are incorrect



~~"Hackborn teaches its device reacts differently depending on the gesture (e.g., tap, swipe)"~~

[Reply, 2](#)



~~Potential conflict because "a tap on the overlapping content could either animate the grass or activate the icon"~~

[Reply, 6](#)



~~"a tap on Hackborn's device offers inadequate data from which to generate responsive movement on the grass wallpaper—e.g., lacking pressure associated with a tap."~~

[Reply, 8](#)



Ground 1A: No Motivation to Combine

Hackborn does not require pressure data to generate an animation, as the Reply asserts.



Petitioner's Theory

Contrasted to a swipe, with side-to-side motion that directly translates to side-to-side motion of grass (e.g., based on the speed and length of the swipe), a tap on Hackborn's device offers **inadequate data** from which to generate responsive movement on the grass wallpaper—e.g., lacking pressure associated with a tap

On typical touchscreen devices, determining pressure requires a pressure sensor, which Hackborn lacks

Since Hackborn does not disclose a vector for storing pressure or a pressure sensor for obtaining pressure, Hackborn's device has no mechanism for determining how to animate grass responsive to a tap



Hackborn

“The message that passes the information may indicate **a vector representing the position, direction, and speed** of the user's dragging motion. Such information 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. **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.”

EX1004, [0033] (cited in POR, 24–25; Sur-Reply, 4)

Reply, 8

Ground 1A: No Motivation to Combine

Petitioner's distinguishing theories are incorrect



~~"Hackborn teaches its device reacts differently depending on the gesture (e.g., tap, swipe)"~~

[Reply, 2](#)



~~Potential conflict because "a tap on the overlapping content could either animate the grass or activate the icon"~~

[Reply, 6](#)



~~"a tap on Hackborn's device offers inadequate data from which to generate responsive movement on the grass wallpaper—e.g., lacking pressure associated with a tap."~~

[Reply, 8](#)



~~"a POSITA would have understood that both the gesture and location determine the 'target of a user's selection or touch.'"~~

[Reply, 9](#)

Ground 1A: No Motivation to Combine

Petitioner's focus on how an icon would respond to contact is incorrect and irrelevant



Petitioner's Theory

- Swiping across an icon would not activate the icon, so location alone does not determine the target
- Additionally, Hackborn discloses that icons and gadgets can be moved on the display by moving gesture inputs
- Therefore, a POSITA would have understood that a tap at a location launches a corresponding application while a swipe over that same location animates the wallpaper.

Reply, 9-10



Claim 1

“[a] touch interface 706 may take a familiar form and may interpret input by a user on a touchscreen” by “coordinat[ing] with the display controller 704 to identify what item or items on a display a user is selecting by touching at a particular location.”

EX1004, [0054] (cited in sur-reply, 3)



Claim 1

Limitation [1.i]: while displaying the first user interface on the display, detecting a first input by a first contact on the touch-sensitive surface at a location in the first user interface that corresponds to the background of the first user interface

Ground 1A: No Motivation to Combine

Westerman's binary threshold distinguishes taps from swipes to activate different functions in the same area, a problem not present in Hackborn



Westerman's Swipe-Detection

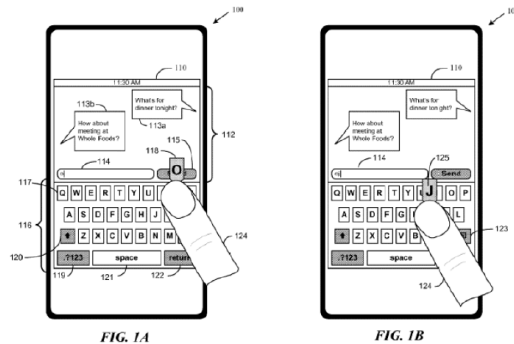


FIG. 1A

FIG. 1B

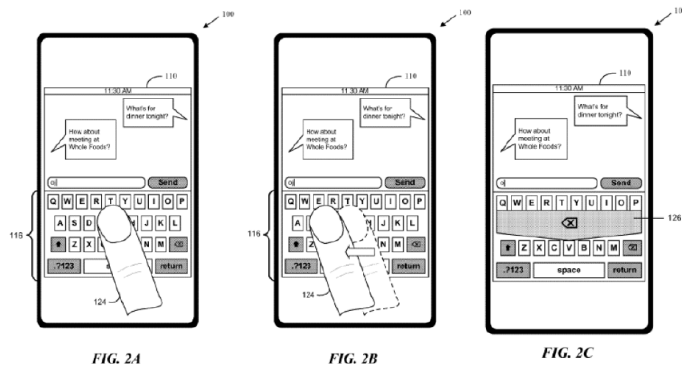


FIG. 2A

FIG. 2B

FIG. 2C

EX1005, FIGS. 1, 2 (cited in POR, 13–14)



Westerman's Goal

“Systems, methods, and devices for interpreting manual swipe gestures as input in connection with touch-sensitive user interfaces that include virtual keyboards are disclosed herein. These allow for a user entering text using the virtual keyboard to perform certain functions using swipes across the key area rather than tapping particular keys. For example, leftward, rightward, upward, and downward swipes can be assigned to inserting a space, backspacing, shifting (as for typing capital letters), and inserting a carriage return and/or new line.”

EX1005, Abstract (cited in POR, 26)

Ground 1A: Claims 1 and 23 Are Not Obvious

Neither Hackborn nor Westerman disclose that change in background appearance is based on a threshold determination

Claim 1 (and Claim 23)

1. An electronic device comprising:

...

[1.j] in response to detecting the first input by the first contact, in accordance with a determination that the first contact has a magnitude that is above a threshold, dynamically changing the appearance of the background of the first user interface without changing an appearance of the one or more foreground objects in the first user interface,

...

Hackborn

“The message that passes the information may indicate a vector representing the position, direction, and speed of the user's dragging motion. Such information 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. 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.”

EX1004, [0033] (cited in POR, 27–28)

Ground 1A: Claims 1 and 23 Are Not Obvious

Hackborn's vector data is sufficient to determine whether finger is touching the grass and the magnitude of the animation if there is contact



Hackborn

“The message that passes the information may indicate a vector representing the position, direction, and speed of the user's dragging motion. Such information 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. 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.”

EX1004, [0033] (cited in POR, 24–25)



Dr. Mahon Declaration

“A POSITA would understand that the magnitude of the vector data is what determines the magnitude of the visual effect of the dynamically generated grass animation. Thus, a POSITA would understand that there is no need for a threshold determination between swipes and taps in Hackborn because less contact movement on the grass already results in less apparent movement of the grass—it is a continuum.

EX2005, ¶64 (cited in POR, 25; Sur-Reply, 4–5)

Ground 1A: Claims 7 and 29 Are Not Obvious

Neither Hackborn nor Westerman disclose that a tap has no function



Claim 7 (and Claim 29)

7. The electronic device of claim 1, wherein the one or more programs include instructions for::
in response to detecting the first input by the first contact on the touch-sensitive surface, **in accordance with a determination that the first input does not have a magnitude above the threshold, maintaining the appearance of the background** of the first user interface.



Westerman

“Keyboard tap recognizer 904 can serve to translate taps on the virtual keyboard surface into key tap events 906. These key tap events are submitted to keyboard input manager 907. **Keyboard input manager 907 interprets key tap events 906 and generates text events 908 that are sent to the applications,** e.g., the entry of letters into text fields as described above.”

EX1005, [0058] (cited in POR, 31)

Ground 1A: Claims 17, 37, and 38 Are Not Obvious

Hackborn's social media feed does not scroll or update in response to any contact as required in claim 1, but as new information is received



Claim 1 (and Claim 23)

1. An electronic device comprising:

[1j] in response to detecting the first input by the first contact ... dynamically changing the appearance of the background

[1.I] wherein the dynamic change in the appearance of the background of the first user interface includes displaying in sequence at least some of a plurality of images based at least in part on the magnitude of the first contact.



Claim 17 (and Claims 37 and 38)

17. The electronic device of claim 1, wherein the electronic device is configured such that the at least some of the plurality of images is displayed, in sequence, by automatically moving, one-by-one, through the at least some of the plurality of images.

Ground 1A: Claims 17, 37, and 38 Are Not Obvious

Hackborn's social media feed does not scroll or update in response to any contact as required in claim 1, but as new information is received



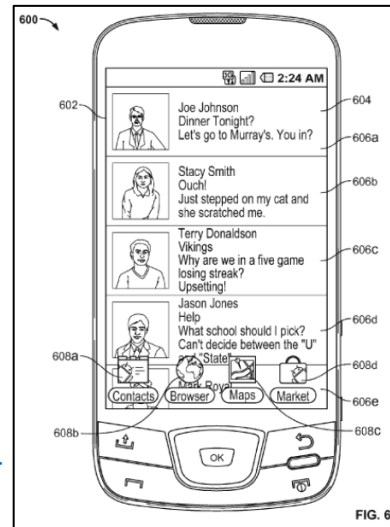
Petitioner's Theory

"With reference to Figure 6 (below), Hackborn explains that ... the images in the posts are displayed in sequence by automatically moving one-by-one through them as new posts are received."

Pet., 39

"[T]he social media feed (which scrolls automatically as new entries arrive)."

Reply, 14



Hackborn

"For example, as new information is received, already displayed posts may be scrolled (e.g., downward) and the new post may be displayed in a predetermined position. For example, post 606 a in the present example may be the most recently received message, and may be displayed near the top of the display 602. When post 606 a is received, the previously displayed posts (e.g., posts 606 b, 606 c, 606 d, 606 e) may be shifted downward."

EX1004, [0047] (cited in POR, 34)

Ground 1A: Claims 17, 37, and 38 Are Not Obvious

Hackborn's social media feed cannot be included in "the at least some of the plurality of images"



Petitioner's Theory

"a POSITA would have understood that the automatically scrolled social media posts could form only part of the background wallpaper display, where the wallpaper includes both the swaying grass from Hackborn's Figure 1 and images from a social networking website."

[Pet., 40–41](#)

"the social media feed (which scrolls automatically as new entries arrive)."

[Reply, 14](#)



Hackborn Social Feed

"as new information is received, already displayed posts may be scrolled (e.g., downward) and the new post may be displayed in a predetermined position. For example, post **606 a** in the present example may be the most recently received message, and may be displayed near the top of the display **602**. When post **606 a** is received, the previously displayed posts (e.g., posts **606 b**, **606 c**, **606 d**, **606 e**) may be shifted downward."

[EX1004, \[0047\] \(cited in POR, 34\)](#)

Ground 1A: Claim 22 Is Not Obvious

The Petition fails to show that Hackborn-Westerman also meets claim 21's limitations because claim 21 was only challenged under Ground 1B



Claim 22

22. The electronic device of claim 21, wherein the electronic device is configured such that at least one of:

...

Ground 1A: Claim 22 Is Not Obvious

The Petition fails to show that Hackborn-Westerman also meets claim 21's limitations because claim 21 was only challenged under Ground 1B



Claim 22 was inadvertently listed in Ground 1A instead of 1B, which included claim 21 from which it depends. *Corephotonics, Ltd. v. Apple Inc.*, 2023, 84 F.4th 990, 1010 (Fed. Cir. 2023) (finding it appropriate for petitioner to correct a mistake from the petition). APPLE-1031, ¶62.

Reply, 19



First, we reject Corephotonics' argument that the Board abused its discretion by permitting Apple to fix the error in its petition, which (in the Board's view) compared Golan and Martin only to one another and did not also contend that each reference was analogous to the Challenged Patents. "In evaluating whether a reference is analogous, we have consistently held that a patent challenger must compare the reference to the challenged patent." *Sanofi-Aventis*, 66 F.4th at 1377. In *Sanofi-Aventis*, the petitioner, Mylan, committed the same error, arguing that its petition satisfied the analogous art test by virtue of the comparisons it made between the prior art references themselves, without regard to the field of endeavor or problem of the patent being challenged. *See id.* at 1378-80. After identifying this mistake, we explained that "[a] petitioner is not required to anticipate and raise analogous art arguments in its petition; instead a petitioner can use its reply" to respond to, for example, arguments raised in a patent owner response. *Id.* at 1379 (citing 37 C.F.R. § 42.23).

Technology Overview

Ground 1A (Hackborn-Westerman)

Ground 1B (Hackborn-Westerman-Townsend)

Ground 1D (Hackborn-Westerman-Jobs)

Ground 2 (Hackborn-Westerman-Jobs)

Ground 1B: Hackborn + Westerman + Townsend



Townsend's Engine to Model Grass Bend/Sway

“[T]o move naturally, objects should also exhibit physical characteristics such as **[1] elasticity** and **[2] deceleration**”

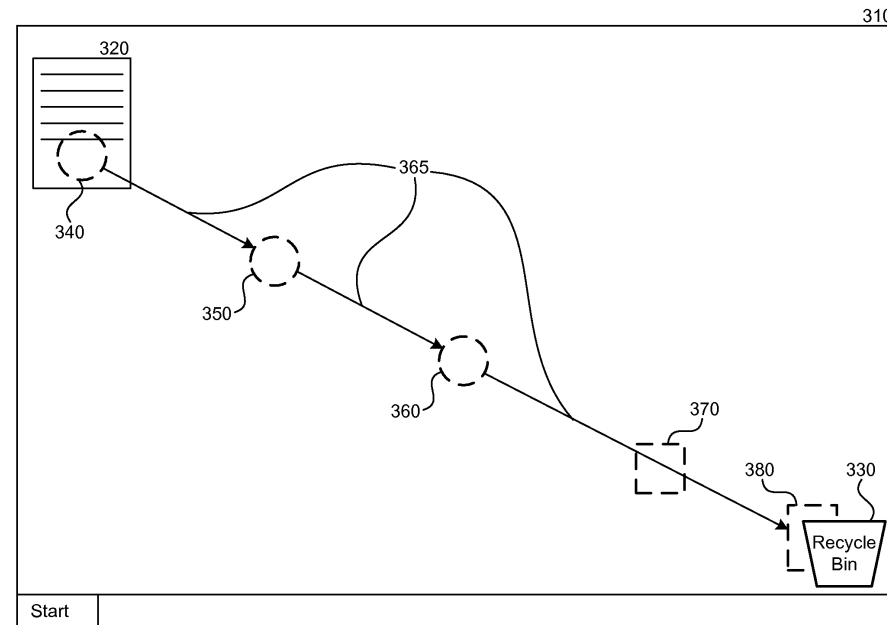


Figure 3

Pet, 44–48; EX1006, [0016], FIG. 3 (cited in POR, 15)

Ground 1B: Townsend

Elasticity



Townsend's Simulation Engine – Elasticity

ElasticMarginBottom

Specifies the bottom region for **bouncing** the target object.

ElasticMarginLeft

Specifies the leftmost region for **bouncing** the target object.

ElasticMarginRight

Specifies the rightmost region for **bouncing** the target object.

EX1006, [0050]-[0051] (cited in POR, 44)



Townsend

“[I]f an application author defines two objects as being elastic, then the two objects may **bounce off each** other when a user moves the objects into each other.

EX1006, [0016] (cited in POR, 15–16, 36)

Ground 1B: Townsend

Deceleration



Townsend's Simulation Engine – Deceleration

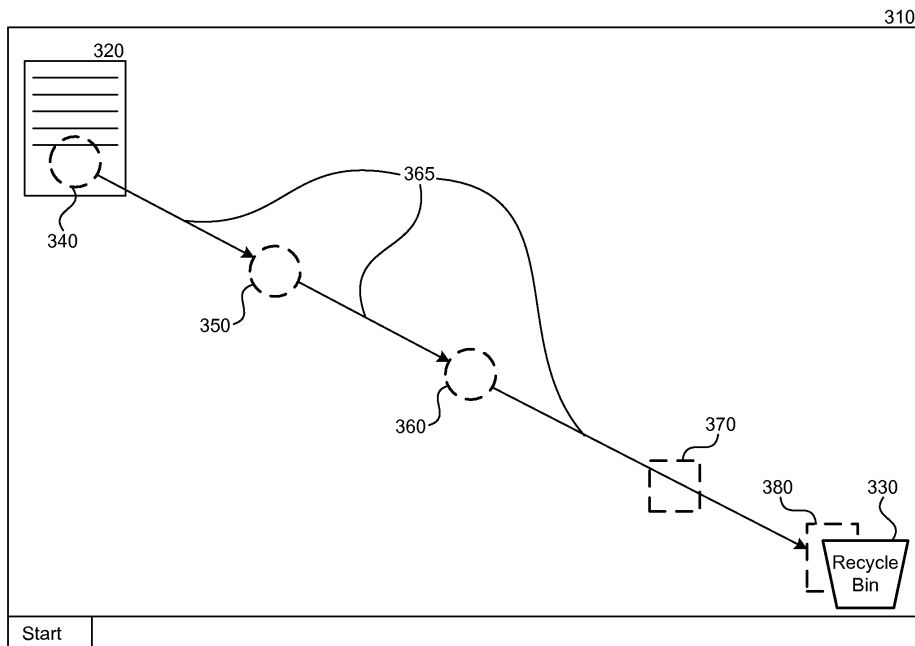


Figure 3

EX1006, FIG. 3



Townsend

“[I]f 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.”

EX1006, [0016] (cited in POR, 44)

Without inertia, the document object **320** would stop at the third manipulation location **360** ... In the example illustrated, even though the inertia system decelerates the movement of the document object **320**, the document object **320** is still able to move a fair distance across the display **310** based on the high initial velocity of the user's movement of the document object **320** at the start

EX1006, [0030] (cited in POR, 44)

Ground 1B: No Motivation to Combine

Petition's motivation over-generalizes Townsend's actual disclosure



“To the extent that Hackborn does not describe specific techniques and implementation details for animating the grass, a POSITA would have naturally looked to related prior art, such as Townsend, which teaches an API and simulation engine that enable applications “to simulate real-world behavior of objects” using “techniques based on physics to simulate the behavior of the object” in response to touch gestures (e.g., animating the movement of blades of grass).”

Pet., 46



“A POSITA would have understood that including an API and simulation engine, such as the one described in Townsend, in Hackborn's device would have served the purpose of providing a mechanism for displaying “live” wallpaper and doing so in a manner that would show the “live” wallpaper responding as if the displayed objects had actually been contacted by the user's finger.”

Pet., 47



“Townsend's goal is clear: simulating the natural movement of objects, including elasticity and deceleration.”

Reply, 14-15

Ground 1B: No Motivation to Combine

Townsend is not a comprehensive physics engine—it only discloses transforms of rotations, scales, and translations of whole objects



Townsend's Simulation Engine

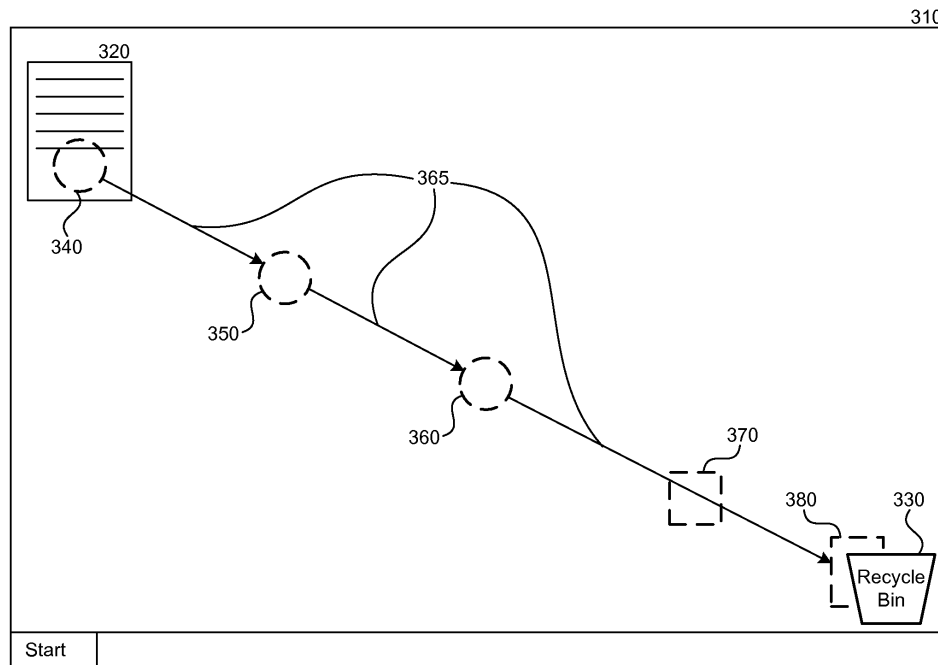


Figure 3



Townsend

“Manipulations map more directly to user intentions than do individual touch inputs and add support for basic transformation of objects using multiple touch contacts. An application can use manipulations to support rotating, resizing, and translating multiple objects (e.g., photos) at the same time. The manipulations may be described as two-dimensional (2D) affine transforms that contain rotation, scale (e.g., zoom), and translation (e.g., pan) information.”

EX1006, [0014] cited in Pet., 45)

EX1006, FIG. 3

Ground 1B: No Motivation to Combine

Townsend's whole object inertia system models rotation, not bending



Townsend

The application interface **150** communicates with the application to receive information and provide manipulation transforms to the application. ...

The initialization information may specify which types of transforms the application object supports for a particular object ...

For example, some application objects may support scaling but not rotation. The initialization information may also specify a **pivot point** of the object. ...

For example, when the inertia system receives low-level touch input that the system interprets as a recognized transform (e.g., a rotation), ...

For example, if the user rotated the object, then the application may store the new orientation of the object to use the next time the application displays the object. As another example, if the object continued to rotate after the user released it based on calculations of the simulation component **140**, then the application may store the new orientation of the object.

EX1006, [0022] (cited in Sur-reply, 10)

Ground 1B: Claims 5, 8, 27 and 30 Are Not Obvious

The Petition theory is inconsistent with Townsend's teaching



Petition's Theory

"A POSITA would have understood that, by simulating "frictional **dragging**," the animating motion of the wallpaper representation (e.g., blades of grass) would appear to slow down, or decay, over time due to a force (e.g., simulated friction) that opposes the "force" provided by the user input (e.g., simulated touching of grass).

Pet., 50



Townsend's Alleged Decay

"In some embodiments, the inertia system receives object constraints from the application. For example, the application may define the elasticity of an object, **friction coefficient** (to determine how an object decelerates), boundary characteristics of the object, and so forth"

EX1006, [0041] (cited in Reply, 18)

"For example, 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."

EX1006, [0016] (cited in Reply, 18)

Ground 1B: Claims 5, 8, 27 and 30 Are Not Obvious

The Reply theory is new, unclear, and inconsistent



Reply's First Theory

“when grass is at the outer edge of the touch screen (as illustrated below) and the user is swiping left-to-right, decay begins after detection of a cessation of the first contact.” APPLE-1003, ¶121; APPLE-1031, ¶¶52-53.

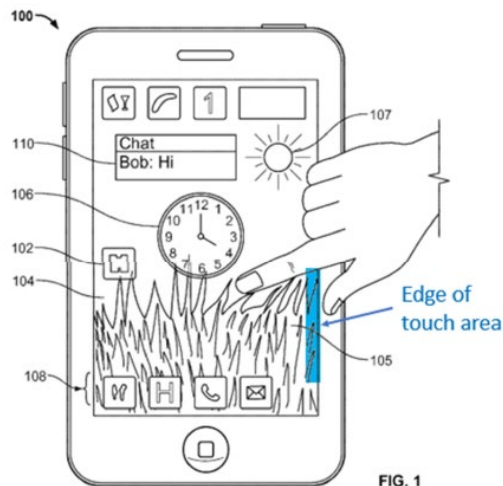


FIG. 1

Reply, 16



Reply's Second Theory

“A POSITA would have understood that, even for blades of grass not at the edge of the touch, in some instances, swaying with decay would continue following contact cessation, even when the decay does not immediately follow cessation, thus rendering obvious ‘decays following detection of a cessation of the first contact.’” APPLE-1031, ¶58.

Reply, 17

Ground 1B: Claims 9, 21, 31 and 43 Are Not Obvious

Hackborn's grass animation does not revert or return to any images



Claim 9 (and Claim 31)

9. The electronic device of claim 1, wherein the one or more programs includes instructions for: in response to detecting a cessation of the first input, ceasing the dynamically changing of the appearance of the background and **reverting to the display of the first user interface**, including the background, on the display.



Claim 21 (and Claim 43)

21. The electronic device of claim 1, wherein the electronic device is configured to, in response to detecting a cessation of the first input, **revert to one of the plurality of images that is different from that which is displayed as the background prior to detecting the first input.**

Ground 1B: Claims 9, 21, 31 and 43 Are Not Obvious

Townsend's friction does not revert or return to any images



Petitioner's Testimony

A POSITA would have understood a decelerating object (e.g., due to friction) **will come to rest**.

A POSITA would have understood that application of an inertial system with elasticity and friction (e.g., Townsend's "inertia system [that] provides more realistic movement for application objects" and **frictional deceleration**) to Hackborn's swaying grass would, in some instances, result in the grass returning (reverting) to its original position once swaying completes.

[Reply, 18-19](#)

Ground 1B: Claims 9, 21, 31 and 43 Are Not Obvious

Hackborn's grass animation does not revert or return to any images but dynamically generates them based on the calculation of the simulation.



Dr. Cockburn Testimony

Q. Based on Hackborn's disclosure, including its depiction of individual blades moving in Figure 1, what is your expectation of Hackborn's fidelity?

A. I think a person of skill in the art's expectation would be towards the higher end of fidelity as the intention because the intention is to make grass blades look as if the finger is actually contacting them as it drags across the screen.

Q. And so higher fidelity would suggest dynamic generation of the images?

A. I think that's fair, as taught by the Hackborn, Westerman, and Townsend combination.

EX2007, 108:18–109:9 (cited in POR, 25, 45)

Technology Overview

Ground 1A (Hackborn-Westerman)

Ground 1B (Hackborn-Westerman-Townsend)

Ground 1D (Hackborn-Westerman-Jobs)

Ground 2 (Hackborn-Westerman-Jobs)

Ground 1D: Jobs



Jobs' Lock Screen

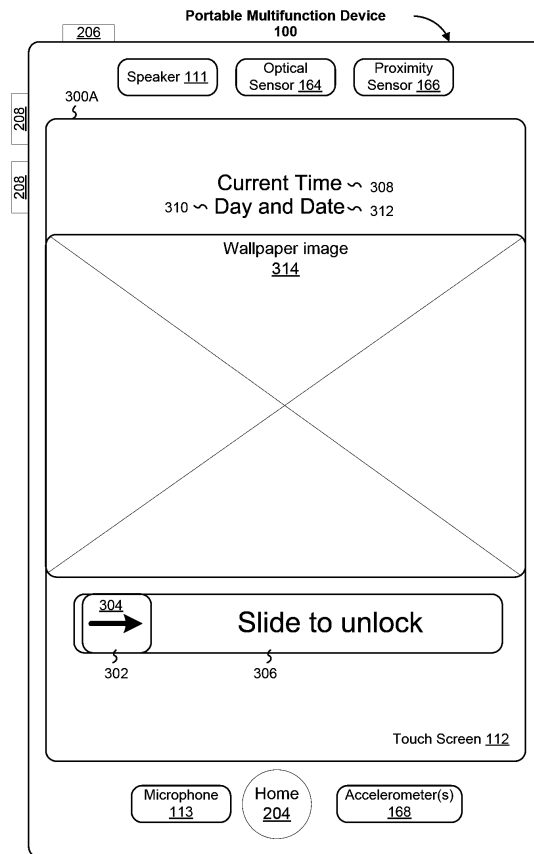


Figure 3A

EX1009, FIG. 3A (cited in Pet., 58)



Jobs'

“One problem associated with using touch screens on portable devices is the **unintentional activation or deactivation of functions** due to unintentional contact with the touch screen.”

EX1010, [0004] (cited in Pet., 58)

“The device transitions to a user-interface unlock state if the detected contact corresponds to a predefined gesture, such as moving the unlock image across channel **306**. Conversely, the device maintains the user-interface lock state if the detected contact does not correspond to the predefined gesture. This process **saves battery power by ensuring that the device is not accidentally awakened.**”

EX1009, [0177] (cited in POR, 47)

Ground 1D: Hackborn + Westerman + Jobs



Jobs' Lock Screen

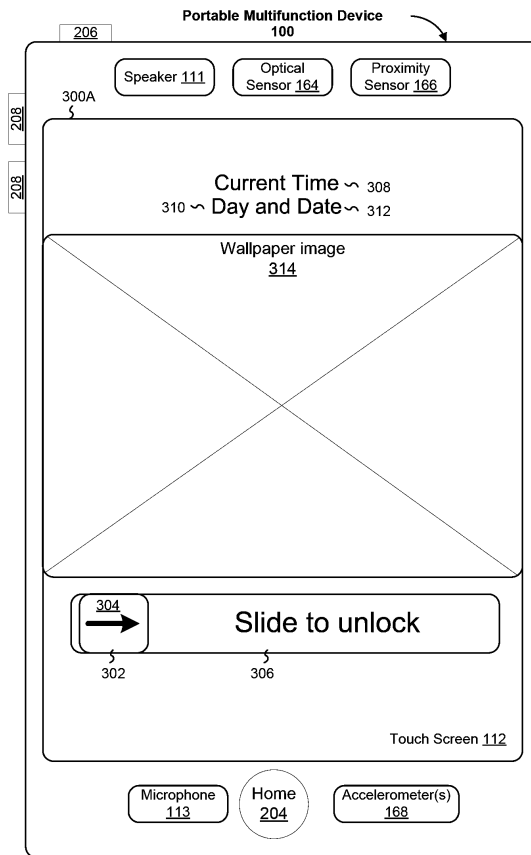
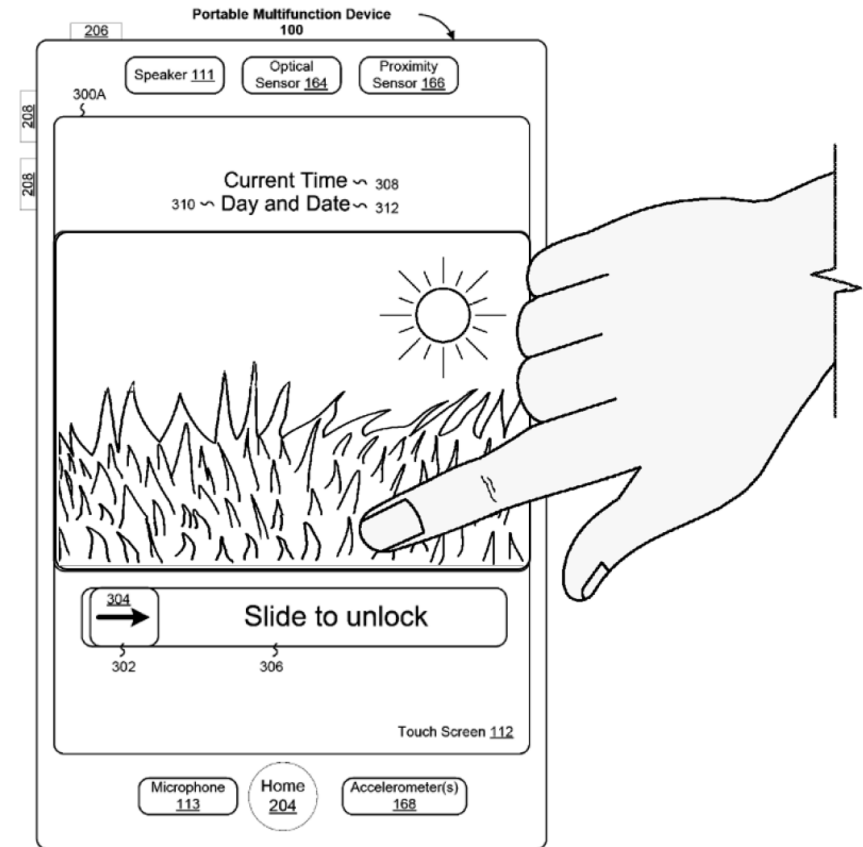


Figure 3A

Pet., 58 (citing EX1009, FIG. 3A)



Petition's Composite Image



Pet., 59–60

Ground 1D: No Motivation to Combine

Petition's motivation to combine is contrary to Jobs' primary purpose for maintaining a lock state



“Additionally, given Hackborn’s teaching of using live wallpaper, it would have been obvious to a POSITA to implement the Hackborn-Westerman-Jobs device (“HWJD”) to include a lock screen with a wallpaper, per Jobs, such that the lock screen wallpaper is “live” like the unlocked screen, per Hackborn.”

Pet., 59



“In this way, ‘the [lock screen] 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,’ per Hackborn. This would have motivated a POSITA to implement the HWJD to include a lock screen with live wallpaper, thereby improving the device by preventing ‘unintentional activation or deactivation of functions’ while still producing an ‘interesting and compelling user interface’ in the lock screen.”

Pet., 59

Ground 1D: No Motivation to Combine

Petitioner's modification would result in unintentional activation of function and drain batter power



Jobs

“The device transitions to a user-interface unlock state if the detected contact corresponds to a predefined gesture, such as moving the unlock image across channel 306. Conversely, the device maintains the user-interface lock state if the detected contact does not correspond to the predefined gesture. This process saves battery power by ensuring that the device is not accidentally awakened.”

EX1009, [0177] (cited in POR, 47; Sur-Reply, 13–14)



Chaudhri (incorporated by reference in Jobs)

“In the user-interface lock state (hereinafter the “lock state”), the device 100 is powered on and operational but ignores most, if not all, user input. That is, the device 100 takes no action in response to user input and/or the device 100 is prevented from performing a predefined set of operations in response to the user input. The predefined set of operations may include navigation between user interfaces and activation or deactivation of a predefined set of functions. The lock state may be used to prevent unintentional or unauthorized use of the device 100 or activation or deactivation of functions on the device 100.”

EX1010, [0049]; EX1009, [0102] (incorporation by reference)
(cited in POR, 47; Sur-Reply, 13)

Ground 1D: Claims 18, 19, 39, and 40 Are Not Obvious

Claim 18 (and Claim 39)

18. The electronic device of claim 1, wherein the electronic device is configured such that **the first user interface includes a lock screen.**

Claim 19 (and Claim 40)

19. The electronic device of claim 1, wherein the electronic device is configured such that **the first user interface includes a lock screen that is unlocked.**

Claim 1 (and Claim 23)

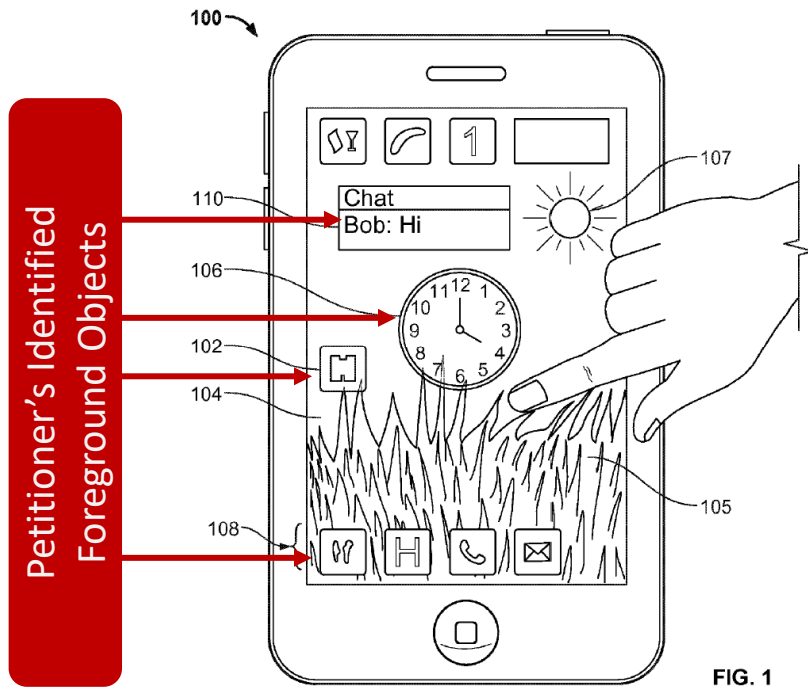
1. An electronic device comprising:
... the first user interface includes:
[1.g] **a background with an appearance**, and
[1.h] **one or more foreground objects**;
...

Ground 1D: Claims 18, 19, 39, and 40 Are Not Obvious

The “foreground objects” are not present in Petitioner’s combination.



Hackborn's Home Screen



Petition's Analysis

“Figure 1 of Hackborn shows foreground objects in the form of ‘icon 102,’ ‘gadget 106,’ and ‘application 110,’ each of which exist on a layer in front of the wallpaper 104”

Pet, 18

Pet, 9–12 (citing EX1004, FIG. 1)

Ground 1D: Claims 18, 19, 39, and 40 Are Not Obvious

No “background” or “foreground objects” in Petitioner’s combination



Hackborn’s Home Screen

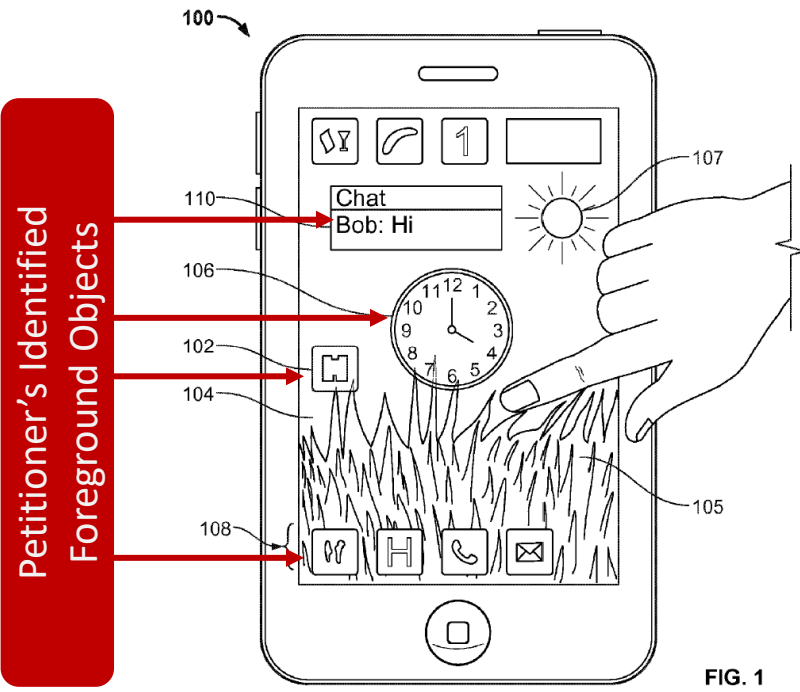
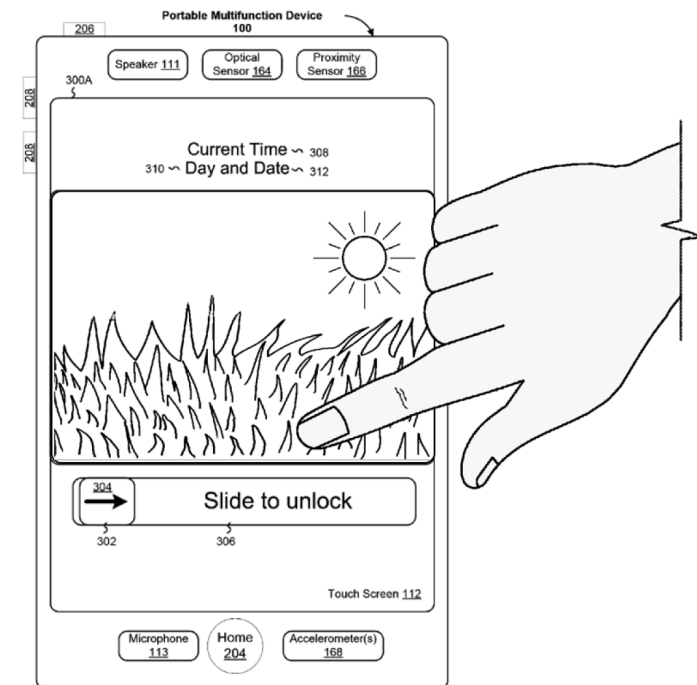


FIG. 1

Pet, 9–12 (citing EX1004, FIG. 1)



Petition’s Hackborn-Jobs Composite Image



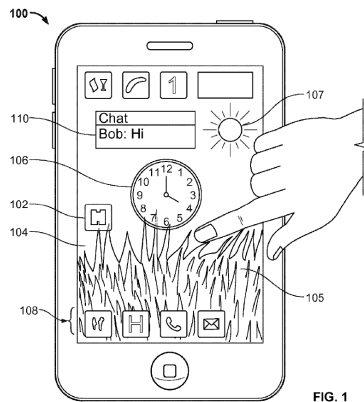
Pet, 59–60

Ground 1D: Claims 18, 19, 39, and 40 Are Not Obvious

Petitioner's Reply theory is new and inconsistent



The programs executed by the processor of the HWD display a first user interface on the display. ... Hackborn shows in Figure 1 and explains that the computing device 100 has a display screen that shows various objects and wallpaper 104.



Pet, 17



Since HWJD's UI (*first user interface*) includes two "screens" (home/lock screens), the Petition's treatment of claims 1 and 18 is consistent. APPLE-1031, ¶¶69-71. Thus, HWJD's UI, including both home and lock screens, renders obvious "the first user interface includes a lock screen." *Id.*

Reply, 22

Technology Overview

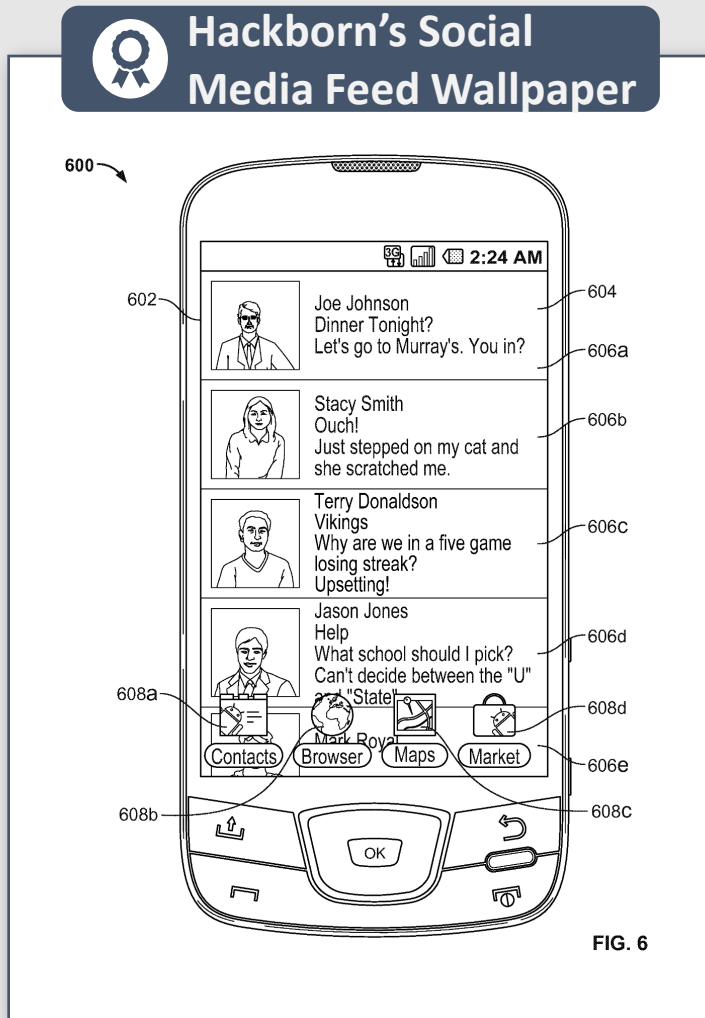
Ground 1A (Hackborn-Westerman)

Ground 1B (Hackborn-Westerman-Townsend)

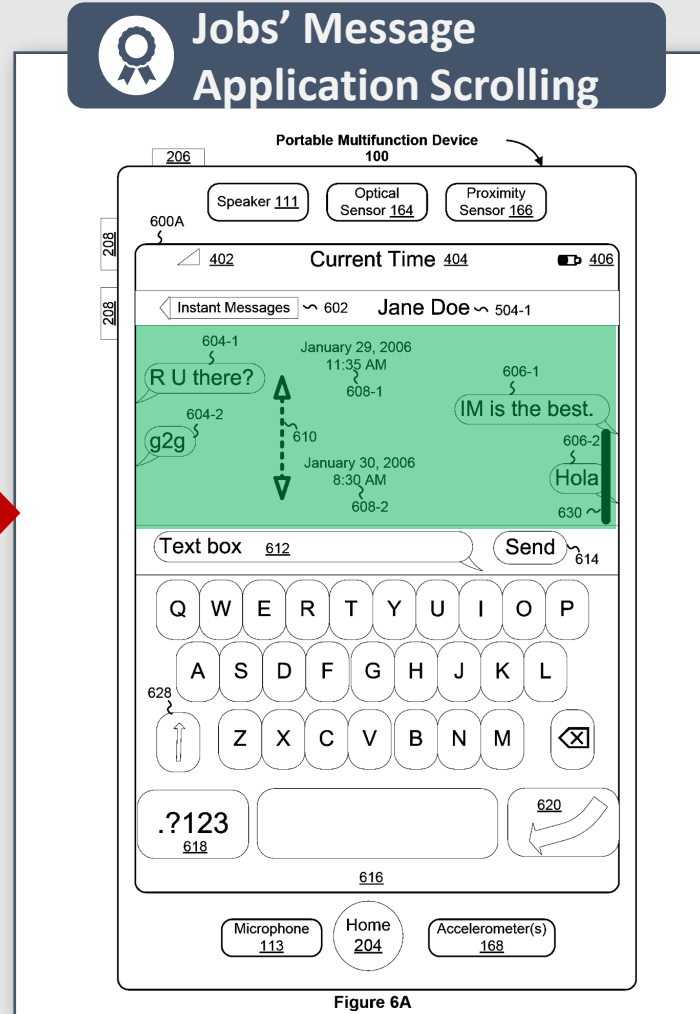
Ground 1D (Hackborn-Westerman-Jobs)

Ground 2 (Hackborn-Westerman-Jobs)

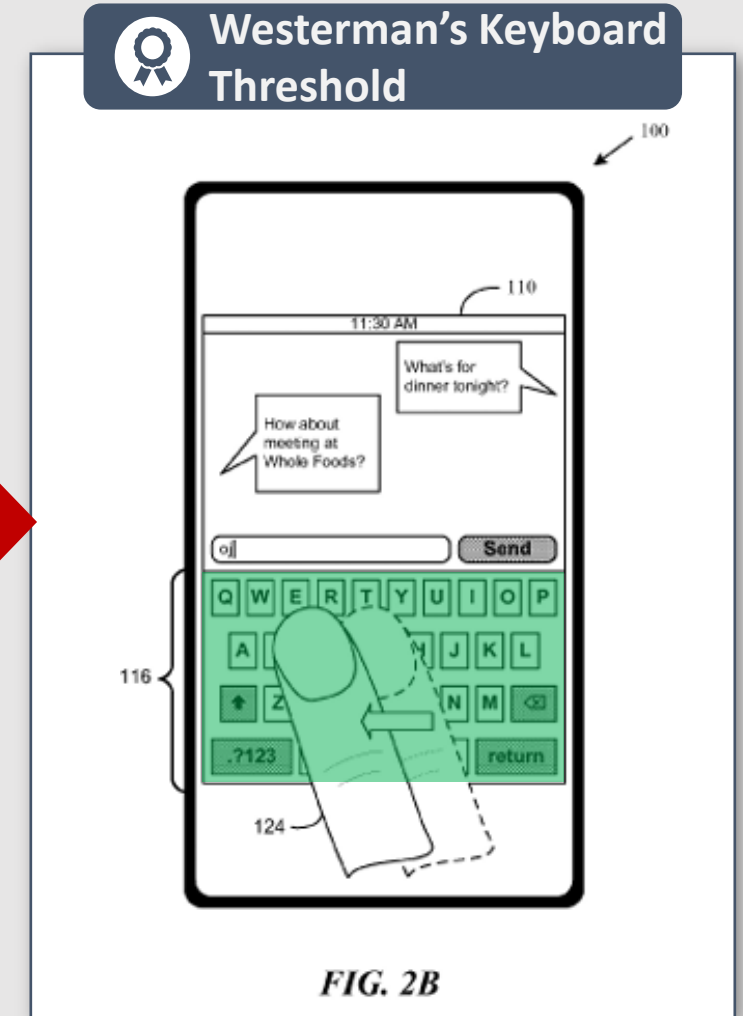
Ground 2: Hackborn + Westerman + Jobs



EX1004, FIG. 6



EX1009, FIG. 6A

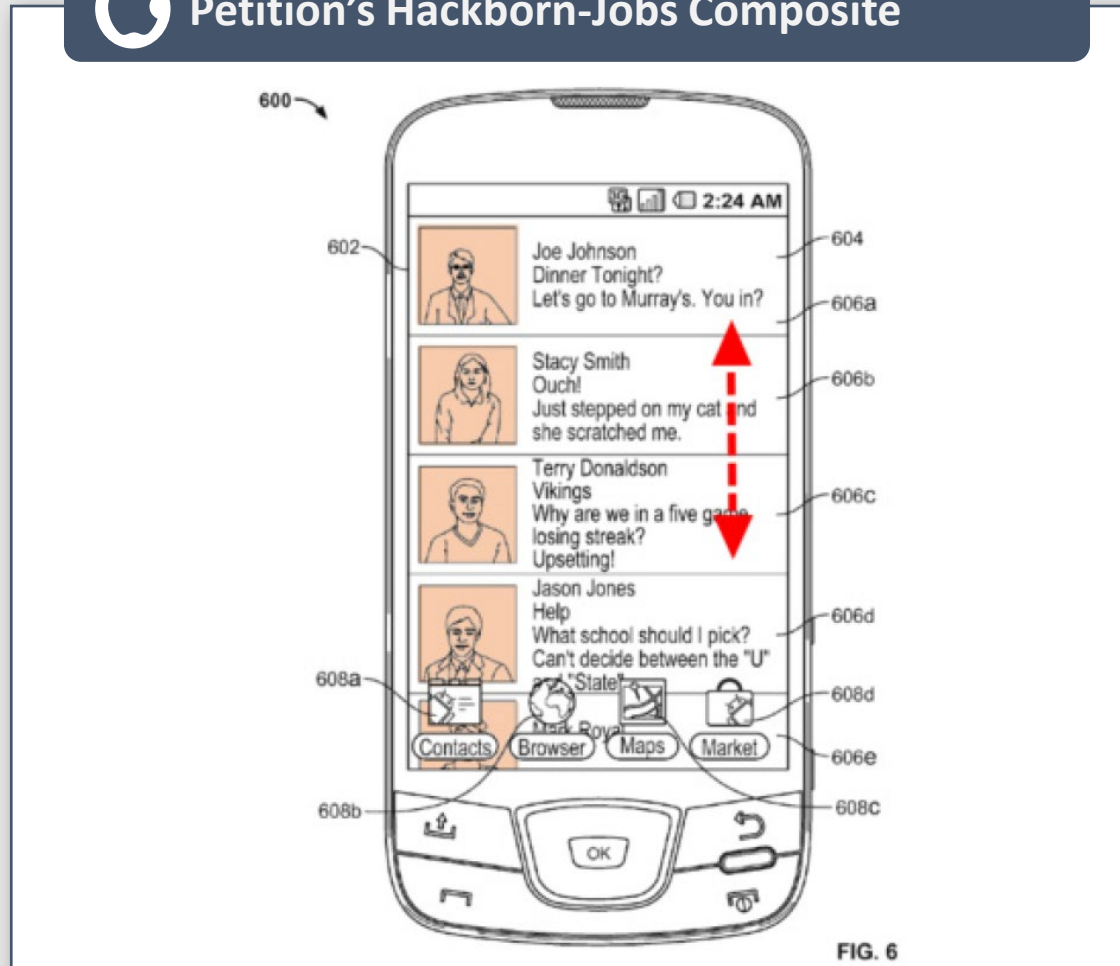


EX1005, FIG. 2B

Ground 2: Hackborn + Westerman + Jobs



Petition's Hackborn-Jobs Composite



Pet, 69–70

Ground 2: No Motivation to Combine

Petitioner relies on the same failed reasoning as Ground 1A to include Westerman's threshold



Petitioner's Ground 2 Theory

"As discussed for Ground 1A, a POSITA would have been motivated to combine the teachings of Hackborn and Westerman ... Since Hackborn discloses the receipt of both swipes and taps, it must distinguish between them. §II.A.1."

[Reply, 30](#)

Regarding Figure 1, Hackborn explains that "a user is swiping her finger across a touch-sensitive display screen of the computing device" can cause the displayed background to change. APPLE-1004, [0028]. A POSITA would have found obvious that Hackborn's device can similarly detect the first input with the live wallpaper shown in Hackborn's Figure 6.

[Pet., 64](#)



Petitioner's Incorporated Ground 1A Analysis

1. Hackborn Must Distinguish Between Swipes and Taps

Contrary to Smith's assertion, Hackborn's device must distinguish between swipes and taps because the device responds differently to each. APPLE-1031, ¶27. Hackborn teaches animating grass wallpaper responsive to *swipes*, and in other examples, teaches switching the device's mode responsive to "*tapping* on the display screen a predetermined number of times within a predetermined time period."

[Reply, 18](#)

Ground 2: No Motivation to Combine

Petitioner relies on the same failed reasoning as Ground 1A to include Westerman's threshold



Petitioner's Ground 1A

"Since 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



Petitioner's Ground 2

For at least the same reasons as discussed in Ground 1A, 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). APPLE-1003, ¶145. Specifically, since 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 Westerman's methods of distinguishing between tap and swipe gestures (e.g., using "predetermined thresholds").

Pet., 63

Ground 2: No Motivation to Combine

Jobs does not distinguish taps from swipes in its scrolling environment



Petitioner's Ground 2 Theory

"Jobs explicitly requires distinguishing 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]."

[Reply, 30](#)



Dr. Mahon

"Jobs teaches the receipt of "taps" but distinguishes them spatially rather than via thresholds. EX1009, [0232], [0237], [0239], [0240], [0241] (discussing multiple examples of "a finger tap" on various icons outside the area displaying the conversation); EX1009, [0243] (discussing "swipe gesture 610 to the area displaying the conversation")."

[EX2005, ¶120](#)



Jobs' Non-scrolling Distinction

"In this embodiment, as well as others described below, a user may select one or more of the graphics by making contact or touching the graphics, for example, with one or more fingers **202** (not drawn to scale in the figure). In some embodiments, selection of one or more graphics occurs when the user breaks contact with the one or more graphics ... For example, a swipe gesture that **sweeps over an application icon** may not select the corresponding application when the gesture corresponding to selection is a tap."

[EX1004, \[0164\] \(cited in Reply, 30\)](#)

Ground 2: No Motivation to Combine

Westerman's threshold gesture determination is unnecessary because Jobs discloses that vertical scrolling occurs based on movement



Jobs

“In response to detecting the movement, the list of items displayed on the touch screen display is scrolled so that a new portion of the list is displayed and the vertical position of the vertical bar is moved to a new position such that the new position corresponds to the vertical position in the list of the displayed new portion of the list.”

EX1009, [1138] (cited in POR, 60; Sur-Reply, 21)

Ground 2: No Motivation to Combine

Petition's motivation to combine ignores Hackborn's teaching regarding the background nature of its live wallpaper



"[A] POSITA reviewing Hackborn's teaching of scrolling social media posts . . . would have found it obvious to provide a way to view older posts . . . that s/he may not have already read before the posts were moved downward and less (or not) visible. [A] POSITA would have found it obvious to allow for manual scrolling through the posts by the user.

Pet., 66



"A POSITA reviewing Hackborn would have naturally looked to Jobs' disclosure of manual scrolling, especially given Hackborn's emphasis on live wallpapers with which a user can interact and teaching of live wallpapers that include images/posts from sources that are constantly receiving new images/posts."

Pet., 70



"A POSITA would have understood that implementing Hackborn's device to associate a user swipe on its live wallpaper background . . . with friction-based scrolling inertia would serve the purpose of providing an intuitive method for allowing a user to interact with the live wallpaper and view new images when the user wishes to see them, or view older posts that may have been automatically scrolled out of view.

Pet., 70–71

Ground 2: No Motivation to Combine



Hackborn's Social Media Feed Wallpaper

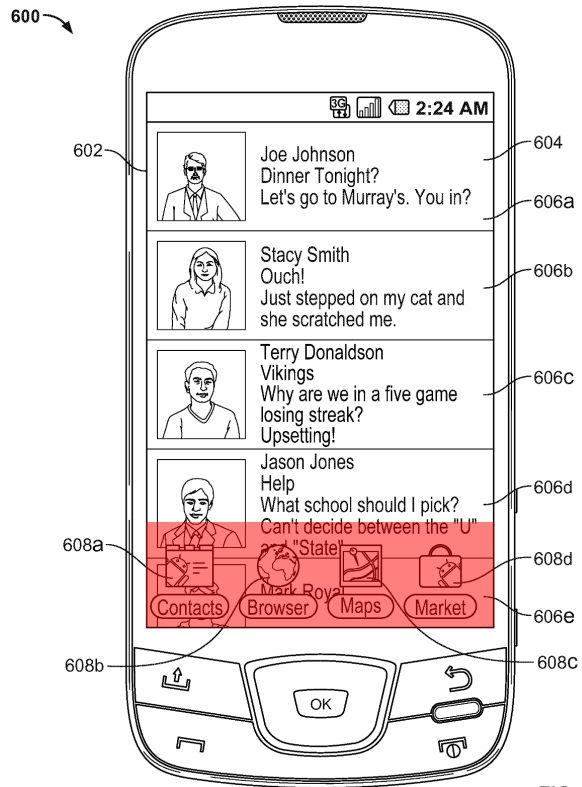


FIG. 6

EX1004, FIG. 6



Hackborn's Obscuring Icons

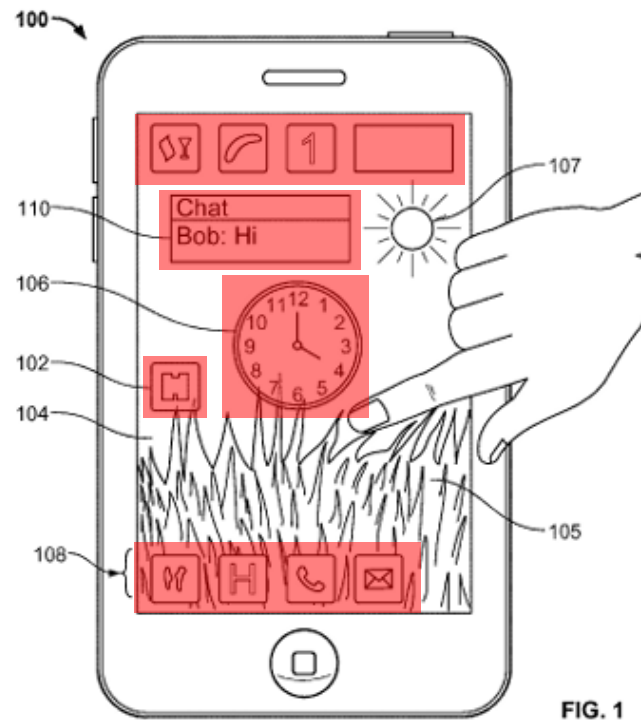


FIG. 1

EX1004, FIG. 1



Hackborn's Obscuring Icons

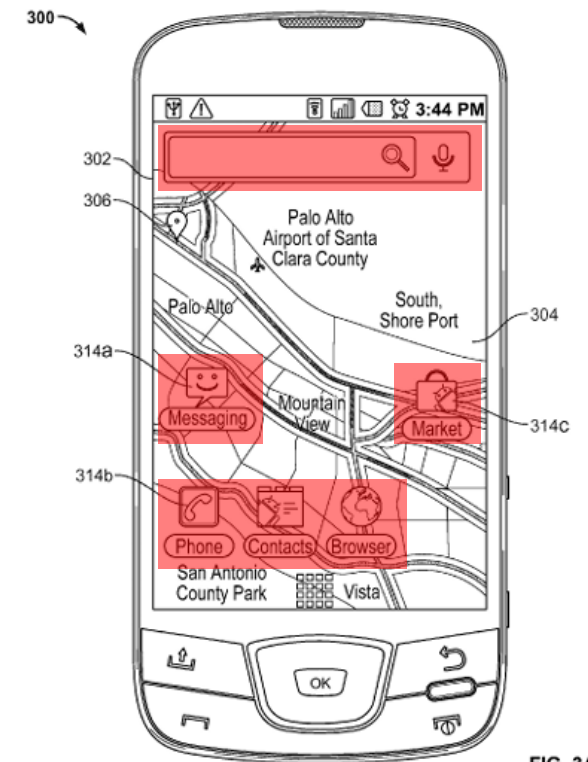


FIG. 3A

EX1004, FIG. 3A

Ground 2: No Motivation to Combine

Hackborn already provides a way to view past posts by opening a social media application with which the posts are associated



Hackborn

“In general and with regard to any of the displayed examples of live wallpaper in the figures, the wallpaper or a portion of the wallpaper be selected, or a particular input may be provided, to cause the wallpaper or portion thereof to assume a more prominent display position or status. In some examples, selection of the wallpaper or a portion of the wallpaper, or provision of a predefined input, may cause an application associated with the wallpaper or a portion of the wallpaper to launch or become active, and may allow the user to work with an aspect of the wallpaper or associated with the displayed wallpaper.

...

For example, if message 606 c represents a Facebook post, selection of message 606 c may launch a Facebook application on device 600, which may permit the user to respond to Donaldson's post 606 c.”

EX1004, [0048] (cited in POR, 54)

Ground 2: Claims 1 and 23 Are Not Obvious

Petitioner does not establish a problem with Hackborn's background



Hackborn's Social Media Wallpaper

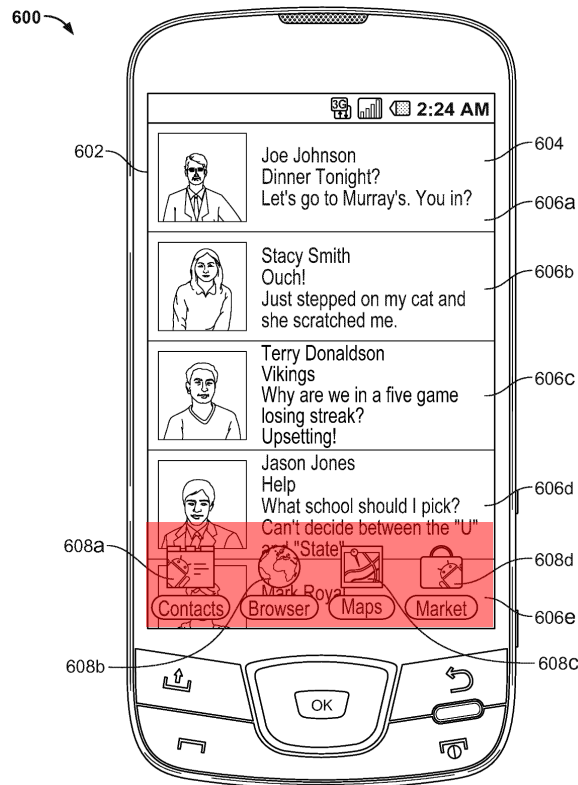


FIG. 6



Petitioner's Assertion

§VI.A.1 "Jobs provides an obvious solution to Hackborn's obscured messages."

[Reply, 25](#)

Ground 2: No Motivation to Combine

The Petition fails to consider or address the technical limitations in implementing manual scrolling in Hackborn's background wallpaper



Dr. Mahon Declaration

"[A] POSITA would understand that implementing Jobs' continuous scrolling in a background context would demand significant modification of Hackborn's wallpaper process to manage historical post data storage, collision with home-screen icons, and continuous input detection to allow up-or-down movement behind foreground objects. Nothing in the references or Petitioner's arguments explains why a POSITA would implement manual scrolling despite these complexities, much less do so with Hackborn's wallpaper remaining in a background layer during that scrolling."

EX2005, ¶117 (cited in POR, 58–59; Sur-Reply, 20)



Reply

"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" (POR, 58), no such limitations or "technical complexities" exist. APPLE-1031, ¶79. For example, a POSITA would have understood that, when UI elements needed to communicate, or that multiple UI elements required touch-related data, well-known techniques were available. *Id.*"

Reply, 29

Ground 2: Claims 1 and 23 Are Not Obvious

No disclosure in Hackborn, Jobs, or Westerman that the feed-based wallpaper scrolls only once a certain threshold is met.



Claim 1 (and Claim 23)

1. An electronic device comprising:

...

[1.j] in response to detecting the first input by the first contact, in accordance with a determination that the first contact has a magnitude that is above a threshold, dynamically changing the appearance of the background of the first user interface without changing an appearance of the one or more foreground objects in the first user interface,

...



Jobs

“In response to detecting the movement, the list of items displayed on the touch screen display is scrolled so that a new portion of the list is displayed and the vertical position of the vertical bar is moved to a new position such that the new position corresponds to the vertical position in the list of the displayed new portion of the list.”

EX1009, [1138] (cited in POR, 62)

Ground 2: Claims 7 and 29 Are Not Obvious

None of the references indicate that taps do nothing



Claim 7 (and Claim 29)

7. The electronic device of claim 1, wherein the one or more programs include instructions for::
in response to detecting the first input by the first contact on the touch-sensitive surface, **in accordance with a determination that the first input does not have a magnitude above the threshold, maintaining the appearance of the background** of the first user interface.



Westerman

“Keyboard tap recognizer 904 can serve to translate taps on the virtual keyboard surface into key tap events 906. These key tap events are submitted to keyboard input manager 907. **Keyboard input manager 907 interprets key tap events 906 and generates text events 908 that are sent to the applications,** e.g., the entry of letters into text fields as described above.”

EX1005, [0058] (cited in POR, 31)

Ground 2: Claims 18, 19, 39, and 40 Are Not Obvious

No “background” or “foreground objects” in Petitioner’s combination



Hackborn’s Home Screen

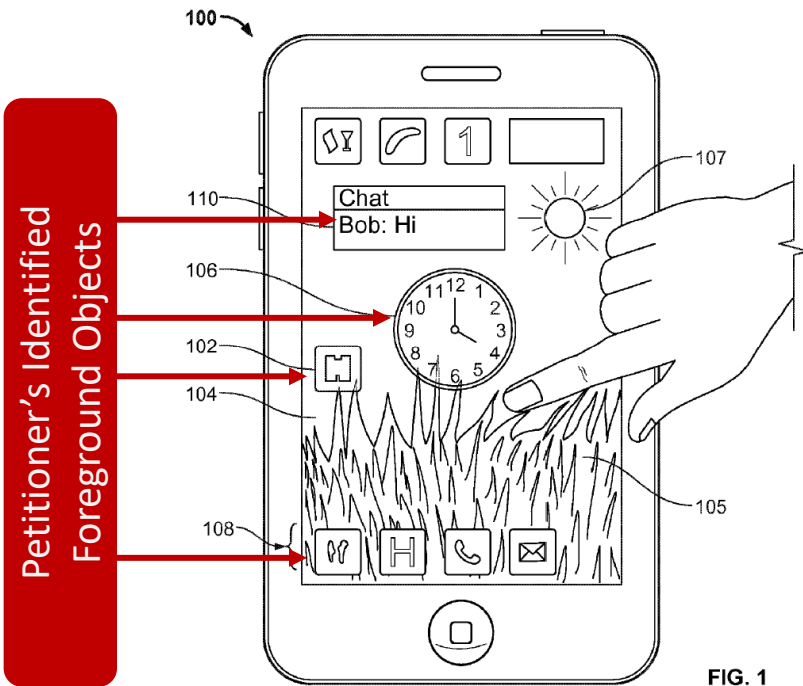


FIG. 1

Pet, 73 (incorporating Pet. 9–12)



Petition's Hackborn-Jobs Composite Image

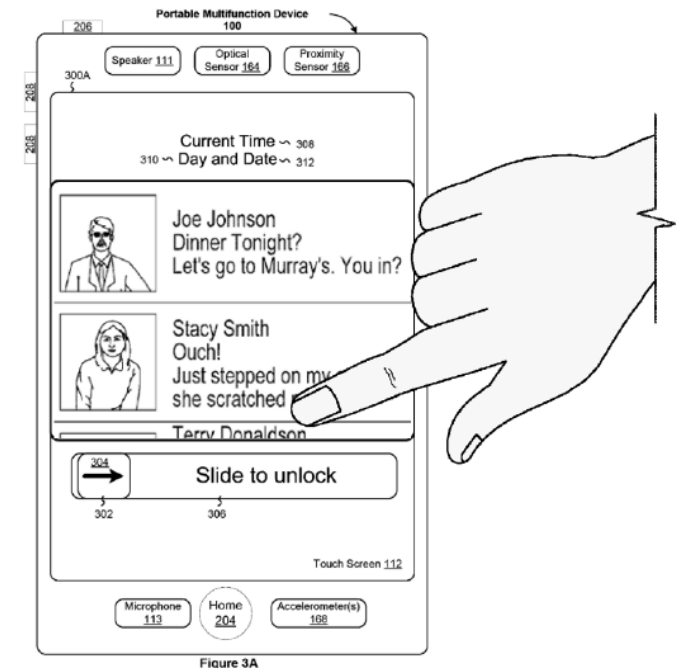


Figure 3A

Pet, 85

Ground 2: Claim 22 Is Not Obvious

The Petition fails to show that Hackborn-Westerman-Jobs also meets claim 21's limitations because claim 21 was only challenged under Ground 1B



Claim 22

22. The electronic device of claim 21, wherein the electronic device is configured such that at least one of:

...

Ground 2: Claim 28 Is Not Obvious

The Petition asserts that scrolling can occur at “any location with the message list,” but “message list” is part of background appearance that changes

Claim 28

28. The method of claim 23, wherein the dynamic change in the appearance of the background of the first user interface is independent of the location that corresponds to the background.

Petition

“Thus, a POSITA would have understood that the scrolling gesture 610 in Figure 6A of Jobs can occur at any location within the message list, and similarly that the scrolling gesture (or a “focus selector,” to the extent one exists in the H2WJD) in the H2WJD can occur at any location on the live wallpaper.”

Pet., 79, 89

[A] POSITA would have found it obvious to implement the H2WJD such that a swiping gesture . . . on the wallpaper 604 of Hackborn would cause the images/posts of the wallpaper 604 to scroll, per Jobs.”

Pet., 77

