

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,

Petitioner

v.

SMITH INTERFACE TECHNOLOGIES, LLC,

Patent Owner

IPR2024-01087

Patent No. 10,656,755

DECLARATION OF RAJEEV SURATI, Ph.D.

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I. INTRODUCTION

1. My name is Dr. Rajeev Surati, Ph.D. I have been retained by Smith Interfaces Technologies, LLC as an independent expert consultant in this inter partes review (“IPR”) proceeding before the United States Patent and Trademark Office (“PTO”).

II. PROFESSIONAL BACKGROUND

2. All of my opinions stated in this Declaration are based on my own personal knowledge and professional judgment. In forming my opinions, I have relied on my knowledge and experience in designing, developing, and researching the technology referenced in this Declaration.

3. I am over 18 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth herein. I understand that a copy of my current curriculum vitae, which details my education and professional and academic experience, is being submitted as EX2002. The following provides a brief overview of some of my experience that is relevant to the matters set forth in this Declaration.

4. I hold a Doctor of Philosophy (Ph.D.) degree in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology (“MIT”) (awarded in 1999) with a Grade Point Average of 5.0/5.0. I obtained a Master of Science degree in Electrical Engineering and Computer Science from MIT (awarded

in 1995) with a Grade Point Average of 5.0/5.0. I have a Bachelor of Science degree in Electrical Engineering from MIT (awarded 1992), graduating with a Grade Point Average of 4.9/5.0.

5. My Ph.D. thesis was entitled “Scalable Self-Calibrating Technology for Large Scale Displays.” My master’s thesis was entitled “Practical Partial Evaluation.” My undergraduate thesis, for which I received MIT EECS’s William A. Martin thesis prize for best undergraduate thesis, was entitled “A Parallelizing Compiler based on Partial Evaluation.” I was also awarded the Department of Energy’s highly-selective Computational Science Fellowship in 1995, which funded my Ph.D. studies.

6. In 1989, I began programming embedded systems and, in 1995, built one of the first publicly available Internet Coke Machines. During that time, I worked on various user interfaces. For example, one to augment the coke machine to dispense coke and another that became one of the early ecommerce mechanisms, using standards-based protocols for tracking user consumption, payments, and drink stock.

7. In 1997, while at MIT pursuing my Ph.D., I started a company called Flash Communications. At Flash, I invented an instant messaging platform focused on enterprise needs. I had the idea while observing the popularity of the Zephyr Instant Messaging Service at MIT beginning in 1988. Attracted by Flash’s

enterprise focus, Microsoft acquired Flash in 1998. With Microsoft, we built both a client and server product. The basic protocol we invented became the foundation for the well-known XMPP protocol that was widely used in the mid-2000s among instant messaging providers. I developed both the client and server products and dealt with many, if not all, of the issues one might face when implementing user interfaces for instant messaging systems. In fact, we helped to build Microsoft's famous MSN product, which adopted various user interface elements we created.

8. As a result of this experience, I became heavily involved with User Interface design on desktop machines, experience that I have continued to develop by building desktop, mobile, and web-based applications used by millions of people.

9. After graduating, I joined Microsoft (as was required by Microsoft in its acquisition of Flash Communications), where I worked on both client and server technologies related to instant messaging. My work spanned both the Microsoft Exchange Instant Messaging product that was released in 2000 and MSN Messenger.

10. From 2000 to 2007, I cofounded, led, and sold a business called photo.net to Namemedia, which is now part of GoDaddy.com. In early 2000, Photo.net was considered a top 1,000 website and it received large amounts of traffic. I built the site from its beginning as a single computer installed in a datacenter to a full rack of computers in that same data center. As a result, I became very familiar with the careful design and programming one must employ to build

and maintain systems that enable both engaging user interfaces and experiences at scale.

11. At photo.net, we prototyped many fundamental Internet community features, such as photo sharing, social networking, and memberships. The photo.net system was written on top of Oracle SQL Database and served up many millions of web pages each day (corresponding to millions of records) with high-volume inserts. The system also incorporated an ecommerce platform used to bill subscriptions, track users, etc. I spent seven years running the site, both writing new features driven by the Oracle SQL database and maintaining tables containing the many millions of records generated by the site. I also served as the database administrator, which provided me with extensive operational experience running such a system. I dealt with everything from database query speedup to the more mundane day-to-day issues, such as the maintenance of relational databases, including backups. In addition to the web interface, we also ran a mobile version of the product based on WAP, which I helped to develop.

12. After developing one of the first photo sharing sites, we further increased user engagement by designing an innovative photo rating interface. Our photo rating system became a huge draw for the site. The rating system increased engagement by four orders of magnitude, ultimately resulting in Sergey Brin, cofounder of Google, asking photo.net to provide imagery to Google for a screen

saver application. Joichi Ito, former head of the MIT Media Lab and a famous internet luminary called it “the best photo sharing site” in 2001.

13. I also innovated user interface technology at Nexaweb, where I was an investor and technical advisor. Nexaweb designed User Interfaces that worked well over the web. At Nexaweb, I spent a great deal of time solving underlying issues related to implementing a UI framework both in Java and Javascript. We also innovated a mechanism using server push prior to the AJAX becoming widely adopted.

14. In 2004, I started Scalable Display Technologies based on the technology in my Ph.D. thesis and the related patent (U.S. Patent No. 6,456,339) entitled “Super-resolution Display.” As part of my Ph.D. thesis, I designed a special display that allows one to create ultra-high-resolution displays composed of multiple projectors tiled with a slight overlap. The system uses camera-based feedback to create an inverse map that drives the system such that a person can only see a continuous, seamless display. There is no visible bezel or overlap. During this project, I became familiar with how and why to drive content onto the display. Thus, I also became familiar with content encoding/decoding, user interfaces for driving large displays, multimedia content storage, high resolution imagery, networks, recording, GPUs, storage of content, etc.

15. At Scalable Display Technologies, I developed the core algorithms and implemented—with a team—the entire software system, which included the core user interface, machine vision and embedded components, and a multimedia playback system. Our first customer was Pixar. Today, the software is primarily used by the US military and commercial theme parks, such as Disney and Universal. Scalable is well-known in the industry for having some of the easiest and intuitive software to use.

16. In parallel with my work at Scalable, I lectured at MIT on many subjects, including the Android operating system. In 2008, I worked with a group of MIT students on the development of mobile applications for Android with Rich Miner, a cofounder of Android. Since many students created applications involving Google Maps and localization, I became familiar with these technologies. I also served as a lecturer and mentor at MIT Play Labs, which was an incubator for augmented reality (AR) and virtual reality (VR) software for mobile handsets and headset applications. Notably, in addition to mobile handsets, Android runs on the Oculus headset. As part of that program, I worked with several startup companies on mobile applications, including a startup that developed applications for Telegram, which is a cross-platform, cloud-based instant messaging system.

17. Since 2014, I have worked as an independent consultant for several companies including NEC, Hitachi, Hi Marley, and Estee Lauder.

18. In 2018, I became a senior partner at nCent Labs. In that role, I consulted on the development of an incentive-market-based platform for block chains and cryptocurrency. Another part of my work at nCent Labs focused on the development of SMS messaging applications for the nCent platform. In that part, I developed a full stack application around the protocol.

19. From 2019 to 2020, I served as a Technical Lead of the Skunkworks at Hydrow, which is a startup company that develops indoor rowing machines. In this role, I worked on special projects, including the development of a VR experience using Magic Leap and Oculus that immersed users in a team-based rowing crew on a scull using VR cinematography. I leveraged my experience with user interfaces and Human-Computer Interaction (“HCI”) to develop a system that gives people a sense of rowing on the water with others, while in reality, they were rowing on a rowing machine. We accomplished our goal through a clever use of cinematography. The result was quite compelling and increased user engagement with their exercise program.

20. In 2020, I started a company called Skyline Nav AI Inc. that develops technology that uses a visual location (i.e., the skyline) to geo-locate the place a picture was taken. At Skyline, I built and now maintain a full user experience centered around a workflow for people to snap a picture and use the image’s skyline and downloaded 3D mode to localize a person. I have written applications for both

Android and iOS that communicate with a backend server running the machine vision algorithms.

21. Over the past decade, I have served as a technical consultant and expert witness on patent litigation matters. In the course of this work, I have provided consulting services to a wide variety of technology companies, including BritishTelecom, Apple, IBM, Philips, Shopify, Zillow, Polaris Powered Technologies, Amazon, Salesforce, Hitachi, Slack, Harris Teeter, and others.

22. During the course of my career, I was the inventor of the subject matter for approximately 15 U.S. Patents. I have also received additional patents, including: U.S. Patent No. 8,817,111, entitled “System and method of calibrating a display system free of variation in system input resolution,” U.S. Patent No. 8,994,757, “System and method for providing improved display quality by display adjustment and image processing using optical feedback,” U.S. Patent No. 9,215,455, “System and method of calibrating a display system free of variation in system input resolution,” U.S. Patent No. 9,369,683, “System and method for calibrating a display system using manual and semi-manual techniques,” and U.S. Patent No. 9,497,447, “System and method for color and intensity calibrating of a display system for practical usage.”

23. I am also a co-inventor of patented technology related to instant messaging, including U.S. Patent No. 5,943,478, which describes associated

technology that I developed related to pop-up, two-way messaging over the Internet. While at Microsoft, I was an inventor on several patents, including: U.S. Patent No. 6,260,148 relating to methods and systems for message forwarding and property notifications using electronic subscriptions; and U.S. Patent Nos. 6,415,318 and 6,604,133 relating to inter-enterprise messaging systems using bridgehead servers. Aspects of these patents relate specifically to messaging and notification technology in telecommunications systems.

24. I serve on the advisory boards of several technology companies, including Paneve, which develops general purpose ASICs coupled with compiler technology; Nexaweb, which develops real-time web application frameworks using HTTPS; Antix Labs, which develops compiler technology for a universal gaming platform; and Permabit, which develops content-addressable storage.

25. In addition to my above experience, I have published papers on subjects relating to computing systems, computer network communications, databases, and other subjects within the realm of electrical and computer engineering. I have also received several awards for my contributions as an inventor and entrepreneur, including the Global Indus. Technovator Award 2009 and Laureate of 2009 Computer World Honors Program. My publication and award history are listed in more detail on my CV.

III. COMPENSATION

26. My work on this matter is being billed at my customary rate of \$700 an hour. Also, I am being reimbursed for reasonable expenses I incur in relation to my services. I have no pecuniary interest in the outcome of this proceeding. I understand I will be paid regardless of the outcome of any proceeding in which my work is used.

IV. LEGAL CONSIDERATION

27. I am not an attorney. My understanding of the law is based on information provided by counsel for Smith Interface Technologies, LLC.

A. Obviousness

28. I understand that a claimed invention is obvious and, therefore, not patentable if the subject matter claimed would have been obvious to a person of ordinary skill in the art at the time that the invention of the '755 Patent (a "POSITA"), which I have been asked to treat as August 5, 2011.

29. I understand that a claim can be obvious in view of a single prior art reference (e.g., via modification of that prior art reference) or multiple prior art references (e.g., via a combination of two or more prior art references), if such a modification or combination was within the skill of a POSITA. I understand that there must be some articulated reasoning with some rational underpinning to support a conclusion of obviousness. I also understand that to establish a finding of obviousness one must show that one of ordinary skill in the art would have had a

motivation to combine the prior art references to produce the claimed invention and a reasonable expectation that the combination would be successful.

30. I further understand that exemplary rationales that may support a conclusion of obviousness include: (1) simply arranging old elements in a way in which each element performs the same function it was known to perform, and the arrangement yields expected results, (2) merely substituting one element for another known element in the field, if the substitution yields no more than a predictable result, (3) combining elements in a way that was “obvious to try” because of a design need or market pressure, where there was a finite number of identified, predictable solutions, (4) that design incentives or other market forces in a field would have prompted variations in a work that were predictable to a person of ordinary skill in the art, and (5) that there was some teaching, suggestion, or motivation in the prior art that would have led a POSITA to modify or combine prior art references to arrive at the claimed invention.

B. Claim Interpretation

31. I understand that a claim term is interpreted according to its ordinary and customary meaning as a POSITA would have understood the term in light of the surrounding claim language, other claims, the specification, and the patent’s prosecution history, which are referred to as intrinsic evidence. I also understand that prior art references cited in the patent’s prosecution history are considered

intrinsic evidence. I further understand that evidence outside the patent and its prosecution history (e.g., dictionaries and technical articles), may inform the context in which a POSITA would have understood the claims of a patent. I understand this ordinary and customary meaning applies absent unique circumstances, such as where a patent clearly expresses an intent to set forth a special meaning for a term.

V. Overview of Task & Basis for Opinions

32. I have been asked to review the '755 Patent. I have been asked to provide opinions related to certain issues from the perspective of a person of ordinary skill, having knowledge of the relevant art, as of August 5, 2011, and—except where otherwise noted—the opinions stated in this declaration are from that perspective. The qualifications and abilities of such a person are described in paragraph 38 below.

33. More particularly, I have been informed that this proceeding is currently at a preliminary stage during which the Patent Trial and Appeal Board (the Board) will decide whether the Petition establishes a reasonable likelihood of at least one claim of the '755 Patent being invalid. I also understand that the Board may review the Petition under a stricter “compelling merits” standard that requires the Petition to make a stronger showing of invalidity; however, my analysis is not performed using this higher standard. At this preliminary stage, I have been asked to focus my analysis on the Petition’s proposed invalidity theories for the '755 Patent’s independent claims 1 and 23.

34. My opinions are based on my education, training, and experience as well as items that I reviewed to prepare my opinions, including the Petition, the documents listed in the Exhibit List included with the Petition, and any other items that I reference in my below analysis.

35. I understand that other issues may arise that require further explanation, and I will provide that explanation if appropriate. As a result, I respectfully reserve the right to update and supplement this declaration and the information and opinions provided herein.

VI. Level of Skill in the Relevant Art

36. I understand that a patent must be analyzed from the perspective of a person of ordinary skill in the art (“POSITA”) as of the time of invention of the patent, which is typically considered to be the patent’s earliest filing date. While I do not necessarily agree with every aspect of Dr. Cockburn’s explanation of the level of ordinary skill in the art, I do not currently believe the aspects of that explanation I would change or clarify would impact the analysis set forth in this declaration. For purposes of this declaration, my opinions are therefore provided from the perspective of the POSITA described by Dr. Cockburn’s declaration (EX1003) as of August 5, 2011, which is produced below:

“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.” EX1003, ¶26.

VII. OVERVIEW OF THE ’755 PATENT

37. The ’755 Patent “generally relate[s] to touch screens.” EX1001, 1:37-38.

38. Specifically, the ’755 Patent focuses on improving user interfaces for increasingly complex touchscreen devices. EX1001, Abstract.

39. For example, the claims include, responsive to the magnitude of a gesture exceeding a threshold, dynamically changing the appearance of a background—without changing the appearance of foreground objects—displaying in sequence multiple images based at least in part on the magnitude of the gesture. EX1001, Cl. 1, 23.

40. “Gesture magnitude refers to the magnitude of the associated gesture dynamics. For example, in one embodiment, the gesture magnitude of a swipe gesture may include the length of the swipe and/or the contact pressure exerted during the swipe.” EX1001, 67:1–5.

41. “[T]he operations associated with a gesture may be carried out as a function of the associated gesture dynamics,” which “are aspects of a gesture that may vary without changing the identity of the gesture.” EX1001, 65:18–22.

42. Examples of such aspects include “contact point velocity, contact point acceleration, contact pressure velocity, contact pressure acceleration, time to complete gesture, and/or any other aspect which may be associated with a gesture.” EX1001, 65:22–27.

43. “[A] selection function may determine one or more presentation properties of a selection,” “vary one or more presentation properties as a function of contact pressure,” or “determine one or more fundamental properties of a selection.” EX1001, 29:30–59.

44. “[P]ossible presentation properties may include, but are not limited to, shading, color, contrast, brightness, line style, animation routine, transparency, pattern, border style, area style, and/or any other visual property that may describe an object on a display.” EX1001, 29:31–36.

45. For example, the selection (e.g., background of the first user interface) can dynamically change as a function of user input based on that input exceeding a threshold (e.g., pressure exerted on the device exceeds a threshold). EX1001, Abstract, 29:43–46.

46. Figure 22 of the '755 Patent depicts such a configuration, in which the user can “dynamically chang[e] an appearance of a background [blurring] based at least in part on a magnitude of a contact [pressure].” EX1001, Figure 22.

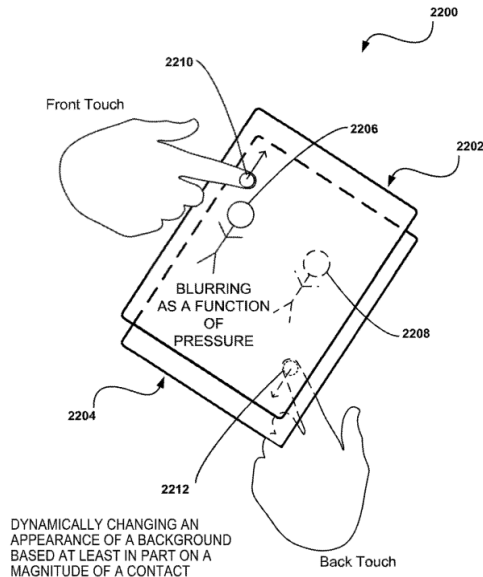


FIGURE 22

A. Independent Claims 1 and 23

47. The '755 Patent has two independent Claims 1 and 23.
48. Claim 1 is directed to an “electronic device.” EX1001, 101:10.
49. Claim 23 is directed to a “method.” EX1001, 108:51.
50. Claims 1 and 23 are substantially similar.
51. Claims 1 and 23 each recite “a display, a touch-sensitive surface, one or more processors, and memory.” Limitations [1.a], [1.b], [1.c], [1.d], [23.a], [23.b], [23.c], [23.d].

52. Claim 1 recites “one or more programs, wherein the one or more programs are stored in the memory and configured to be executed by the one or more processors, the one or more programs including instructions for.” Limitation [1.e].

53. Claims 1 and 23 then each recite “displaying a first user interface on the display, wherein the first user interface includes: a background with an appearance, and one or more foreground objects.” Limitations [1.f], [1.g], [1.h], [23.e], [23.f], [23.g].

54. Claims 1 and 23 then each recite “while” or “with” “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.” Limitations [1.i], [23.h].

55. Claims 1 and 23 then each recite “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.” Limitations [1.j], [23.i].

56. Claims 1 and 23 then each recite “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.” Limitations [1.k], [23.j].

57. Claims 1 and 23 then each recite “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.” Limitations [1.1], [23.k].

VIII. OVERVIEW OF THE PRIOR ART

A. U.S. Patent Application Publication No. 2011/0119610 (“Hackborn”)

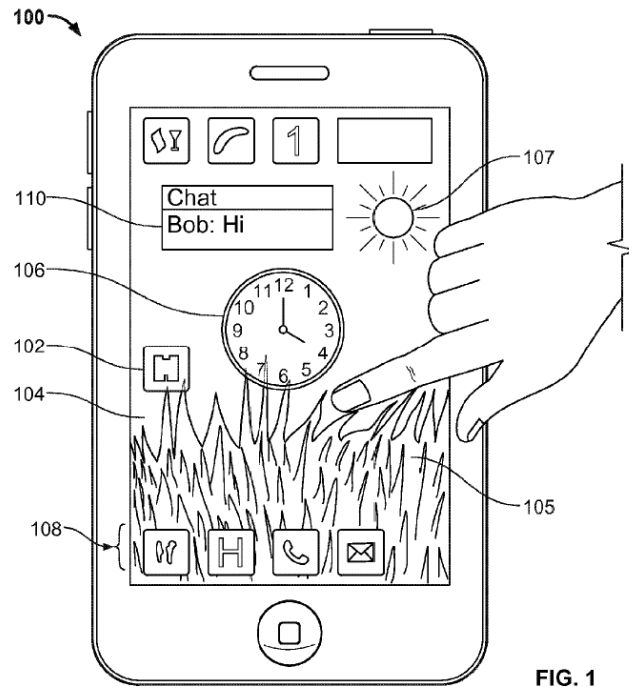
58. U.S. Patent Application Publication No. 2011/0119610 is titled “Live Wallpaper” and lists as its inventors Dianne K. Hackborn, Michael A. Cleron, Romain P. Guy, and Joseph M. Onorato. I will refer to this reference as “Hackborn.”

59. Hackborn “relates to components of computer operating systems, including background desktop components commonly referred to as computer wallpaper.” EX1004, [0002].

60. Hackborn is directed at systems and methods for “animating” a traditional wallpaper on the home screen of a mobile computer device to produce a “live wallpaper.” *See, e.g.*, EX1004, [0009] (“method further includes producing an animated moving display of the graphical wallpaper representation”).

61. Hackborn accomplishes this by making the traditional wallpaper “an object that includes executable code” which is executed in response to input and “cause[s] the wallpaper 104 to change in appearance.” EX1004, [0026].

62. Hackborn's Figure 1 shows a "general home screen layout," that includes "wallpaper 104" and "icons 108." *See, e.g.,* EX1004, [0026], [0030].



63. Hackborn explains that "the wallpaper shows grass 105" and "may ordinarily look like a traditional wallpaper in the form of a static image." EX1004, [0026]. However, this "wallpaper may be active, and in this example may **respond to inputs** from a user of the computing device." *Id.* (emphasis added).

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

65. 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].

66. Thus, Hackborn discloses a display controller determining what a user selects—*e.g.*, wallpaper 104 vs. icon 108—based on location of a user input rather than the type of user input or gesture.

67. Nor does Hackborn limit the wallpaper-moving user inputs to swipes; instead, Hackborn explicitly refers to a user swiping as an “example.” EX1004, [0028].

68. As an alternative to a wallpaper always reacting to user inputs, Hackborn explains that “[o]ther examples of live wallpaper may not be immediately responsive to user input on the screen of the device” and may instead “become responsive to direct user input only after a predetermined user input is received by the device.” EX1004, [0028].

69. “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.” *Id.*

70. Here too, Hackborn does not disclose or suggest that the type of input impacts whether a user input is interpreted as applying to the wallpaper or an icon; rather, in one mode, all user inputs are directed to the wallpaper and, in another mode, all user inputs are directed to icons.

71. Hackborn also notes that “[e]xamples of *predetermined user inputs* that may be received by the device to [*switch from the icon mode to the wallpaper mode, i.e.,*] 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.” EX1004, [0028].

72. Hackborn’s only discussion of a tap input is therefore in the context of a device in the first mode (in which all inputs are to the icon display layer; *not* the wallpaper): “tapping on the display screen a predetermined number of times within a predetermined time period” to switch the device into the wallpaper-input mode in which all user inputs cause the wallpaper to react.

B. U.S. Patent Application Publication No. 2008/0316183 (“Westerman”)

73. U.S. Patent Application Publication No. 2008/0316183 is titled “Swipe Gestures For Touch Screen Keyboards” and lists as its inventors Wayne Carl

Westerman, Henri Lamiriaux, and Matthew Evan Dreisbach. I will refer to this reference as “Westerman.”

74. Westerman “relates generally to input systems, methods, and devices, and more particularly, to systems, methods, and devices for interpreting manual swipe gestures as input in connection with touch-screen keyboards.” EX1005, [0011]. “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.” EX1005, Abstract (emphasis added).

75. Westerman developed its “textual input on virtual keyboards” techniques to address challenges with “[c]onventional touch-typing techniques” that are “difficult to use on touch-screen based small form factor devices” and force users to resort to “‘hunt and peck’ typing techniques.” EX1005, [0017].

76. Westerman’s Figure 1A shows “a user typing” using a “virtual keyboard 116” by employing “directional swipes (also referred to herein as ‘swipe gestures’) over the alphabetic keys” “as an alternative to striking certain key.” EX1005, [0028], [0043], [0045].

77. “[T]he user is entering the text ‘ok’ in response to a query received through a chat application. By tapping finger 124 on the area corresponding to the letter ‘o’ on virtual keyboard 116 the letter ‘o’ is entered in text field 114. A tophat 118 with a representation of the letter ‘o’ is displayed providing feedback to the user.

As shown in FIG. 1B, the user then attempts to tap the letter ‘k’ using finger 124. However, the user inadvertently taps the letter ‘j’ as indicated by top hat 125. Although this typographical error could be corrected through the use of virtual backspace key 123, the backspace function can also be invoked by the rightward [sic] swipe illustrated in FIGS. 2A through 2C.” EX1005, [0047].

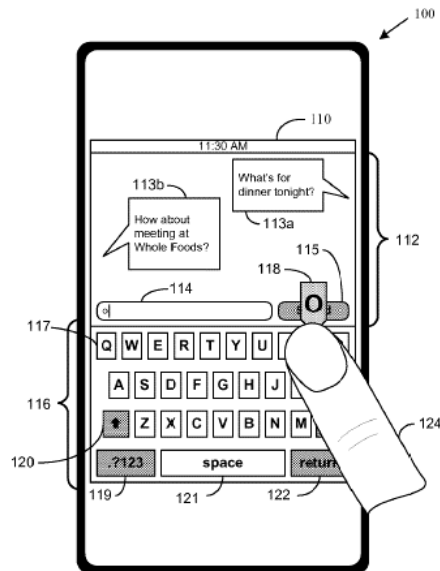


FIG. 1A

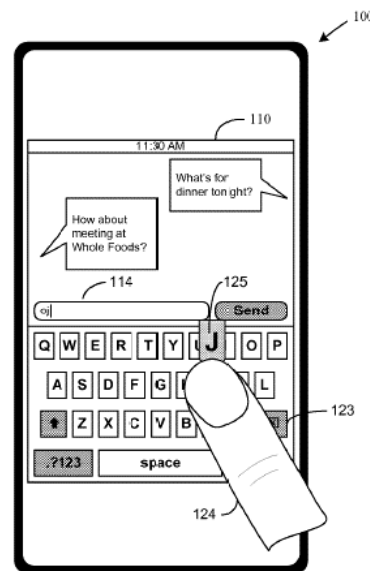


FIG. 1B

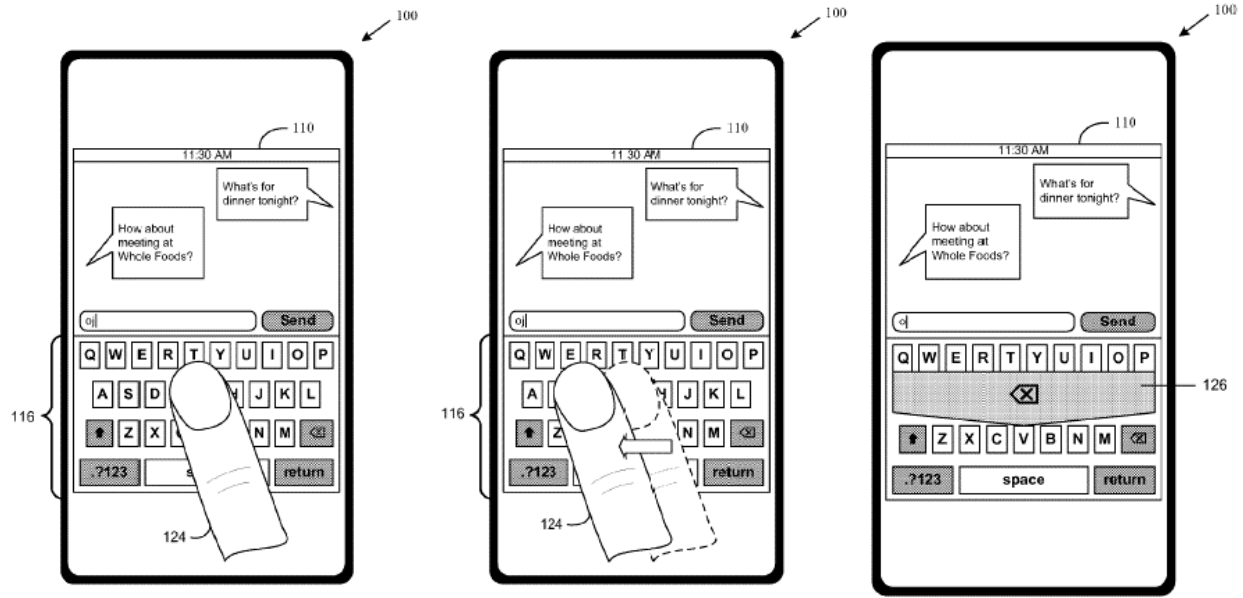


FIG. 2A

FIG. 2B

FIG. 2C

78. Westerman discloses “a method for interpreting swipe gesture input to a device” using “a virtual keyboard area, in which taps of a touch object generate text input.” EX1005, [0018].

79. Westerman’s focus is virtual keyboards, for which taps were already conventionally detected; as such, Westerman’s approach to swipe detection (and distinguishing taps) is specific to the context of virtual keyboards.

80. In particular, Westerman describes that “[d]etecting 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.” EX1005, [0019].

81. However, even if displacement exceeds a threshold, the gesture may still be interpreted as a “tap” if the duration of the gesture exceeds “a maximum swipe gesture timeout threshold.” *Id.*

82. This timeout threshold “can be used to allow slower motions to permit a user to fine tune key selection e.g., using the displayed top hats [corresponding to letter ‘keys’].” *Id.*, [0062].

83. Specifically, “[i]f 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, and the system updates the key choice that corresponds to the location of the finger (block 1008).” *Id.*

84. Westerman does not suggest animating an image depending on whether an input is a swipe or a tap.

IX. Claims 1 and 23 are non-obvious over the Hackborn-Westerman Device (HWD)

85. Dr. Cockburn does not argue that on their own, Hackborn or Westerman, disclose elements [1.j] and [23.i] from claims 1 and 23. *See* EX1003, ¶¶65–67, 102.

86. Dr. Cockburn asserts the HWD renders obvious elements [1.j] and [23.i]. EX1003, ¶¶65–67, 102.

87. For the reasons above and below, the HWD fails to render elements [1.j] and [23.i] obvious.

A. [1.j] and [23.i]: The HWD Would Not Change Hackborn's Background In Accordance With A Determination That The User Input Has A Magnitude That Is Above a Threshold

88. Limitation [1.h] recites “evaluating a duration of the first single-finger touch input against at least one of: . . . one or more action-option-display criteria.”

89. Dr. Cockburn contends that “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’).” EX1003, ¶52.

90. Dr. Cockburn’s theory rests on the premise that because “Hackborn explains that its device can register both swipes and taps,”¹ “[a] POSITA reviewing Hackborn would have naturally looked to Westerman to better understand how to . . . discern between different user inputs (e.g., tap or swipe).” EX1003, ¶¶52, 148.

91. Dr. Cockburn further claims that because “Hackborn and Westerman both describe the use of touchscreen devices and predetermined criteria for registering touches on the device, a POSITA would have reasonably understood the

¹ Dr. Cockburn’s characterization of this quote grossly generalizes Hackborn’s single mention of “taps,” as explained in above, undermining Dr. Cockburn’s asserted motivation for the combination.

combination of Hackborn with Westerman to be successful with no unexpected results.” EX1003, ¶53.

92. Dr. Cockburn relies solely on Hackborn for the foundational decision of whether and when to change the appearance of its background. *See, e.g.*, EX1003, ¶¶47–51. Dr. Cockburn turns to Westerman for guidance on “how to discern between different user inputs (e.g., tap or swipe).” EX1003, ¶¶52–53. Dr. Cockburn does not propose any modifications to which possible user inputs cause Hackborn to change the appearance of its background. *See id.*

93. Dr. Cockburn then turns to Hackborn’s example of a “user [] swiping her finger across a touch screen” to cause “blades of grass swiped by the user . . . to bend or sway as if contacted by the user’s finger during the swipe.” EX1003, ¶65.

94. Then, for Limitation [1.j], Dr. Cockburn simply *assumes* that the grass only moves if the user has swiped instead of tapped. EX1003, ¶65. Dr. Cockburn does not say it so directly until the mapping for Limitation [1.k]—“the grass movement effect only occurs in the HWD if the input is determined to be a swipe”—but that asserted point is the crux of Dr. Cockburn’s entire obviousness theory.

95. Yet Dr. Cockburn offers no explanation as to why the words of Hackborn—disclosing an “example” of a user swiping—would have suggested that a swipe will cause the grass to move, but a tap will not.

96. Dr. Cockburn assumes too much. Hackborn neither discloses nor suggests that whether its wallpaper “grass” moves depends at all on the type of user input received.

97. Hackborn instead indicates that its wallpaper responds to any “user input” on the wallpaper or, when in a certain mode, responds to any “user input” anywhere on the screen. EX2001

98. As explained above, Hackborn broadly discloses that when in a mode in which a user is permitted to interact with its wallpaper, its “wallpaper . . . may respond to inputs from a user of the computing device.” EX1004, [0026]; *see also* EX1004, [0028] (“in another mode . . . user input may be interpreted as being directed to items displayed on the wallpaper”).

99. Hackborn does not limit those user inputs to swipes. To the contrary, after broadly disclosing user inputs, Hackborn lists “swiping” as a mere example of such a user input: “In the example shown in FIG. 1, a user is swiping . . .” EX1004, [0028]).

100. A POSITA would therefore understand from Hackborn’s disclosure that when its device permits a user to interact with a wallpaper, Hackborn’s “grass” will move responsive to any user input, regardless of whether a swipe or tap.

101. Dr. Cockburn does not point to anything in Westerman that would change the disclosed functionality of Hackborn. Rather, Dr. Cockburn merely states

that “a POSITA would have further found obvious that the HWD would be implemented such that, if the user input ‘exceeds the minimum swipe length threshold’ and/or if the ‘initial velocity at touchdown’ is greater than a velocity threshold, the input is ‘interpreted as a swipe event.’” EX1003, ¶67.

102. As explained above, however, whether an input is interpreted as a tap or a swipe is irrelevant because Hackborn’s grass moves in response to any input, not just a swipe.

103. Hackborn therefore does not disclose or suggest that its wallpaper “grass” moves in response to a swipe, but would not move in response to a tap.

104. Even if Westerman’s teachings were incorporated, an input crossing a threshold to become a swipe thus would not impact whether or not Hackborn’s grass moves.

105. Dr. Cockburn therefore fails to show that the HWD combination would disclose or suggest either of Limitations[1.j] or [23.i]: “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.”

X. Claims 1 and 23 are non-obvious over the Hackborn2-Westerman-Jobs Device (H2WJD)

106. Dr. Cockburn's Ground 2 starts from a similar premise as Ground 1, with the exception that Ground 2 focuses on wallpaper 604 of Hackborn's Figure 6 (rather than wallpaper 104 of Hackborn's Figure 1). EX1003, ¶¶107–109. Other than that, the foundations of Hackborn's and Westerman's teachings remains the same as discussed above.

107. Dr. Cockburn also adds Jobs into the mix for Ground 2, specifically asserting that a "POSITA would have found it obvious to modify Hackborn's live wallpaper 604 such that a user could scroll through the images/posts of the wallpaper 'using vertically upward and/or vertically downward gestures' (i.e., swipes, detected as Westerman teaches) 'on the touch screen,' as Jobs, instead of or in addition to new images/posts being scrolled in, as Hackborn teaches." EX1003, ¶153.

108. Similar to the flaw explained above for Ground 1, Dr. Cockburn's theory for the addition of Jobs merely makes the social media posts in wallpaper 604 scrollable via user inputs (e.g., via vertical swipes) rather than automatically scrolling downward as new posts are added.

109. But, as explained above, Dr. Cockburn does not articulate a rationale for changing Hackborn's foundation in which any user input on wallpaper 604 will cause the appearance of the wallpaper to change (by scrolling).

110. For example, in asserting that scrolling via vertical swipes would have been obvious, Dr. Cockburn does not assert (much less explain why) that would have required not performing the same animation via other user inputs, such as taps.

111. As such, Dr. Cockburn simply does not articulate a theory for modifying Hackborn to only change the appearance of its background in this way (scrolling) when receiving a swipe (but not when receiving a tap).

112. Ultimately, Hackborn does not disclose or suggest that its wallpaper moves in response to a swipe, but would not move in response to a tap.

113. As such, even if Westerman's teachings are incorporated, an input crossing a threshold to become a swipe would not impact whether or not Hackborn's wallpaper moves.

114. Similarly, even if Jobs scrolling is added along with Jobs' particular treatments of vertical swipes, Dr. Cockburn does not assert that (much less explain why) doing so would modify Hackborn to not scroll its background when receiving other inputs.

115. Dr. Cockburn therefore fails to show that the Hackborn2-Westerman-Jobs combination would disclose or suggest either of Limitations[1.j] or [23.i]: "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

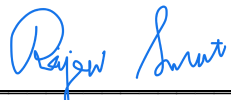
without changing an appearance of the one or more foreground objects in the first user interface.”

XI. CONCLUSION

116. All statements made herein of my own knowledge are true, all statements made herein on information and belief are believed to be true, and these statements were made with the knowledge that willful false statement and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001.

Respectfully submitted,

Dated: October 22, 2024



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