

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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METHOD, AND COMPUTER PROGRAM PRODUCT

DECLARATION OF DR. ANDREW COCKBURN

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LISTING OF CHALLENGED CLAIMS

Claim 1	
[1.pre]	An electronic device, comprising:
[1.a]	a display;
[1.b]	a touch-sensitive surface;
[1.c]	one or more processors;
[1.d]	memory; and
[1.e]	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:
[1.f]	displaying, on the display, an application launching user interface that includes a plurality of application icons for launching corresponding applications;
[1.g]	while displaying the application launching user interface, detecting a first single-finger touch input that includes detecting the first single-finger touch input at a location on the touch-sensitive surface that corresponds to a first application icon of the plurality of application icons, wherein the first application icon is for launching a first application that is associated with one or more corresponding action options; and

[1.h]	in response to detecting the first single-finger touch input, determining a response to the first single-finger touch input based on evaluating the first single-finger touch input against at least one of a plurality of criteria, including evaluating a duration of the first single-finger touch input against at least one of: one or more application-launch criteria, one or more action-option-display criteria, or one or more operation criteria, and further including evaluating a movement of the first single-finger touch input against one or more movement criteria, for:
[1.i]	in accordance with a determination that the first single-finger touch input meets the one or more application-launch criteria that is met when the duration of the first single-finger touch input is evaluated to be less than a first time threshold, launching the first application,
[1.j]	in accordance with a determination that the first single-finger touch input meets the one or more action-option-display criteria that is met when the duration of the first single-finger touch input is evaluated to be greater than the first time threshold, displaying one or more action option objects associated with the first application without launching the first application,
[1.k]	in accordance with a determination that the first single-finger touch input meets the one or more operation criteria that is met when the duration of the first single-finger touch input is evaluated to be greater than a second time threshold that is greater than the first time threshold, performing an operation in connection with the first application icon, and
[1.l]	in accordance with a determination that the first single-finger touch input meets the one or more movement criteria, moving the first application icon in a foreground virtual display layer so that the first application icon appears to float above a background virtual display layer.

Claim 9	
[9]	The electronic device of claim 1, wherein the one or more programs include instructions for, in response to determining that the one or more action-option-display criteria has been met, generating a first tactile output that is indicative of a satisfaction of the one or more action-option-display criteria.

Claim 12	
[12]	The electronic device of claim 1, wherein displaying the one or more action option objects includes displaying the one or more action option objects in a menu that includes a plurality of action option objects.

Claim 19	
[19]	The electronic device of claim 1, wherein: the first application is a content creation application; the one or more action option objects include a respective action option object that is associated with creating a new object; and wherein the one or more programs include instructions for: detecting selection of the respective action option object, and, in response to detecting selection of the respective action option object, creating the new object.

Claim 20	
[20]	The electronic device of claim 19, wherein the content creation application includes an email application, and the new object includes a new email message.

Claim 21	
[21]	The electronic device of claim 1, wherein: the first application is a content creation application; the one or more action option objects include a respective action option object that is associated with displaying at least a portion of previously created content; and wherein the one or more programs include instructions for: detecting selection of the respective action option object, and, in response to detecting selection of the respective action option object, displaying the at least portion of previously created content.

Claim 22	
[22]	The electronic device of claim 21, wherein the content creation application includes an email application, and the displayed at least portion of previously created content includes a previous email message, for generating a reply thereto.

Claim 24	
[24]	The electronic device of claim 1, wherein the electronic device is configured such that the operation is related to a delete operation.

Claim 25	
[25]	The electronic device of claim 1, wherein the electronic device is configured such that the operation includes displaying a graphical user interface element for, in response to detecting a selection thereof, deleting the first application icon.

Claim 26	
[26]	The electronic device of claim 1, wherein the electronic device is configured such that the operation includes entering an icon reconfiguration mode in which one or more of the plurality of application icons is capable of being reorganized on the application launching user interface.

Claim 27	
[27]	The electronic device of claim 1, wherein the electronic device is configured such that the operation includes changing a mode of operation.

Claim 28	
[28]	The electronic device of claim 1, wherein the electronic device is configured such that the operation includes adding a graphical user interface element to the first application icon.

Claim 29	
[29]	The electronic device of claim 1, wherein the electronic device is configured such that the operation includes moving the first application icon.

Claim 30	
[30]	The electronic device of claim 1, wherein the electronic device is configured such that the operation includes at least partially rotating the first application icon.

Claim 31	
[31]	The electronic device of claim 1, wherein the electronic device is configured such that the operation includes animating the first application icon.

Claim 32	
[32]	The electronic device of claim 1, wherein the electronic device is configured such that the operation includes cyclically animating the first application icon.

Claim 35	
[35]	The electronic device of claim 1, wherein the electronic device is configured such that, in accordance with the determination that the first single-finger touch input meets the one or more movement criteria, multiple of the plurality of application icons is moved in the foreground virtual display layer so that the multiple of the plurality of application icons appear to float above the background virtual display layer.

Claim 36	
[36]	The electronic device of claim 1, wherein the electronic device is configured such that the one or more action option objects associated with the first application is displayed along with the first application icon.

Claim 37	
[37]	The electronic device of claim 1, wherein the electronic device is configured such that, in accordance with the determination that the first single-finger touch input meets the one or more movement criteria, at least a portion of a different user interface is displayed on at least a portion of the display that was previously occupied by at least multiple of the plurality of application icons in the application launching user interface.

Claim 38	
[38]	The electronic device of claim 1, wherein the electronic device is configured such that, in accordance with the determination that the first single-finger touch input meets the one or more movement criteria, at least a portion of a different user interface is displayed on at least a portion of the display that was previously occupied by at least multiple of the plurality of application icons in the application launching user interface immediately prior to detecting the first single-finger touch input.

Claim 39	
[39]	The electronic device of claim 1, wherein the electronic device is configured such that, in accordance with the determination that the first single-finger touch input meets the one or more movement criteria, at least a portion of the application launching user interface is changed to display at least a portion of a different user interface on a portion of the display that was previously occupied by at least multiple of the plurality of application icons in the application launching user interface immediately prior to detecting the first single-finger touch input.

Claim 40	
[40]	The electronic device of claim 1, wherein the electronic device is configured such that, in accordance with the determination that the first single-finger touch input meets the one or more movement criteria, at least a portion of the application launching user interface is ceased to be displayed.

Claim 41	
[41]	The electronic device of claim 1, wherein the electronic device is configured such that the floating is a function of the movement of the first application icon.

Claim 42	
[42]	The electronic device of claim 1, wherein the electronic device is configured such that an action is performed utilizing the first application in response to detection of a selection of at least one of the one or more action option objects.

Claim 43	
[43]	The electronic device of claim 1, wherein the electronic device is configured such that an action is performed utilizing another application other than the first application in response to detection of a selection of at least one of the one or more action option objects.

Claim 47	
[47]	The electronic device of claim 1, wherein the electronic device is configured such that, during detection of the first single-finger touch input and prior to displaying the one or more action option objects, a user interface element is displayed to appear at least partially behind the first application icon.

Claim 57	
[57]	The electronic device of claim 1, wherein the electronic device is configured such that at least one of the one or more action option objects includes content that is dynamically generated.

Claim 58	
[58]	The electronic device of claim 1, wherein the electronic device is configured such that at least one of the one or more action option objects includes content that is dynamically generated based on historical usage.

Claim 59	
[59]	The electronic device of claim 1, wherein the electronic device is configured such that at least one of the one or more action option objects includes content that is dynamically generated based on historical usage of the first application.

Claim 63	
[63.pre]	A method, comprising:
[63.a]	at an electronic device including a display and a touch-sensitive surface:
[63.b]	displaying, on the display, an application launching user interface that includes a plurality of application icons for launching corresponding applications;
[63.c]	with the application launching user interface displayed, detecting a first single-finger touch input that includes detecting the first single-finger touch input at a location on the touch-sensitive surface that corresponds to a first application icon of the plurality of application icons, wherein the first application icon is for launching a first application that is associated with one or more corresponding action options; and

[63.d]	in response to detecting the first single-finger touch input, determining a response to the first single-finger touch input based on evaluating the first single-finger touch input against at least one of a plurality of criteria, including evaluating a duration of the first single-finger touch input against at least one of: one or more application-launch criteria, one or more action-option-display criteria, or one or more operation criteria, and further including evaluating a movement of the first single-finger touch input against one or more movement criteria, for:
[63.e]	based on a determination that the first single-finger touch input meets the one or more application-launch criteria that is met based on the duration of the first single-finger touch input being evaluated to be less than a first time threshold, launching the first application,
[63.f]	based on a determination that the first single-finger touch input meets the one or more action-option-display criteria that is met based on the duration of the first single-finger touch input being evaluated to be greater than the first time threshold, displaying one or more action option objects associated with the first application without launching the first application,
[63.g]	based on a determination that the first single-finger touch input meets the one or more operation criteria that is met based on the duration of the first single-finger touch input being evaluated to be greater than a second time threshold that is greater than the first time threshold, performing an operation on the first application icon, and
[63.h]	based on a determination that the first single-finger touch input meets the one or more movement criteria, moving the first application icon in a foreground virtual display layer so that the first application icon appears to float above a background virtual display layer.

Claim 71	
[71]	The method of claim 63, and further comprising: in response to determining that the one or more action-option-display criteria has been met, generating a first tactile output that is indicative of a satisfaction of the one or more action-option-display criteria.

Claim 74	
[74]	The method of claim 63, wherein displaying the one or more action option objects includes displaying the one or more action option objects in a menu that includes a plurality of action option objects.

Claim 81	
[81]	The method of claim 63, wherein: the first application is a content creation application; the one or more action option objects include a respective action option object that is associated with creating a new object; and and further comprising: detecting selection of the respective action option object, and, in response to detecting selection of the respective action option object, creating the new object.

Claim 82	
[82]	The method of claim 81, wherein the content creation application includes an email application, and the new object includes a new email message.

Claim 83	
[83]	The method of claim 63, wherein: the first application is a content creation application; the one or more action option objects include a respective action option object that is associated with displaying at least a portion of previously created content; and and further comprising: detecting selection of the respective action option object, and, in response to detecting selection of the respective action option object, displaying the at least portion of previously created content.

Claim 84	
[84]	The method of claim 83, wherein the content creation application includes an email application, and the displayed at least portion of previously created content includes a previous email message, for generating a reply thereto.

Claim 86	
[86]	The method of claim 63, wherein the operation is related to a delete operation.

Claim 87	
[87]	The method of claim 63, wherein the operation includes displaying a graphical user interface element for, in response to detecting a selection thereof, deleting the first application icon.

Claim 88	
[88]	The method of claim 63, wherein the operation includes entering an icon reconfiguration mode in which one or more of the plurality of application icons is capable of being reorganized on the application launching user interface.

Claim 89	
[89]	The method of claim 63, wherein the operation includes changing a mode of operation.

Claim 90	
[90]	The method of claim 63, wherein the operation includes adding a graphical user interface element to the first application icon.

Claim 91	
[91]	The method of claim 63, wherein the operation includes moving the first application icon.

Claim 92	
[92]	The method of claim 63, wherein the operation includes at least partially rotating the first application icon.

Claim 93	
[93]	The method of claim 63, wherein the operation includes animating the first application icon.

Claim 94	
[94]	The method of claim 63, wherein the operation includes cyclically animating the first application icon.

Claim 97	
[97]	The method of claim 63, wherein, based on the determination that the first single-finger touch input meets the one or more movement criteria, multiple of the plurality of application icons is moved in the foreground virtual display layer so that the multiple of the plurality of application icons appear to float above the background virtual display layer.

Claim 98	
[98]	The method of claim 63, wherein the one or more action option objects associated with the first application is displayed along with the first application icon.

Claim 99	
[99]	The method of claim 63, wherein, based on the determination that the first single-finger touch input meets the one or more movement criteria, at least a portion of a different user interface is displayed on at least a portion of the display that was previously occupied by at least multiple of the plurality of application icons in the application launching user interface.

Claim 100	
[100]	The method of claim 63, wherein, based on the determination that the first single-finger touch input meets the one or more movement criteria, at least a portion of a different user interface is displayed on at least a portion of the display that was previously occupied by at least multiple of the plurality of application icons in the application launching user interface immediately prior to detecting the first single-finger touch input.

Claim 101	
[101]	The method of claim 63, wherein, based on the determination that the first single-finger touch input meets the one or more movement criteria, at least a portion of the application launching user interface is changed to display at least a portion of a different user interface on a portion of the display that was previously occupied by at least multiple of the plurality of application icons in the application launching user interface immediately prior to detecting the first single-finger touch input.

Claim 102	
[102]	The method of claim 63, wherein, based on the determination that the first single-finger touch input meets the one or more movement criteria, at least a portion of the application launching user interface is ceased to be displayed.

Claim 103	
[103]	The method of claim 63, wherein the floating is a function of the movement of the first application icon.

Claim 104	
[104]	The method of claim 63, wherein an action is performed utilizing the first application in response to detection of a selection of at least one of the one or more action option objects.

Claim 105	
[105]	The method of claim 63, wherein an action is performed utilizing another application other than the first application in response to detection of a selection of at least one of the one or more action option objects.

Claim 109	
[109]	The method of claim 63, wherein, with the first single-finger touch input detected and prior to displaying the one or more action option objects, a user interface element is displayed to appear at least partially behind the first application icon.

Claim 119	
[119]	The method of claim 63, wherein at least one of the one or more action option objects includes content that is dynamically generated.

Claim 120	
[120]	The method of claim 63, wherein at least one of the one or more action option objects includes content that is dynamically generated based on historical usage.

Claim 121	
[121]	The method of claim 63, wherein at least one of the one or more action option objects includes content that is dynamically generated based on historical usage of the first application.

Claim 124	
[124.pre]	A non-transitory computer readable storage medium storing one or more programs, the one or more programs comprising instructions which, when executed by an electronic device with a display and a touch-sensitive surface, cause the electronic device to:

[124.a]	display, on the display, an application launching user interface that includes a plurality of application icons for launching corresponding applications;
[124.b]	with the application launching user interface displayed, detect a first single-finger touch input that includes detecting the first single-finger touch input at a location on the touch-sensitive surface that corresponds to a first application icon of the plurality of application icons, wherein the first application icon is for launching a first application that is associated with one or more corresponding action options; and
[124.c]	in response to detecting the first single-finger touch input, determine a response to the first single-finger touch input based on evaluating the first single-finger touch input against at least one of a plurality of criteria, including evaluating a duration of the first single-finger touch input against at least one of: one or more application-launch criteria, one or more action-option-display criteria, or one or more operation criteria, and further including evaluating a movement of the first single-finger touch input against one or more movement criteria, for:
[124.d]	based on a determination that the first single-finger touch input meets the one or more application-launch criteria that is met based on the duration of the first single-finger touch input being evaluated to be less than a first time threshold, launching the first application,
[124.e]	based on a determination that the first single-finger touch input meets the one or more action-option-display criteria that is met based on the duration of the first single-finger touch input being evaluated to be greater than the first time threshold, displaying one or more action option objects associated with the first application without launching the first application,

[124.f]	based on a determination that the first single-finger touch input meets the one or more operation criteria that is met based on the duration of the first single-finger touch input being evaluated to be greater than a second time threshold that is greater than the first time threshold, performing an operation on the first application icon, and
[124.g]	based on a determination that the first single-finger touch input meets the one or more movement criteria, moving the first application icon in a foreground virtual display layer so that the first application icon appears to float above a background virtual display layer.

I, Andrew Cockburn, PhD, declare as follows:

I. INTRODUCTION

1. I have been retained as a technical expert by counsel on behalf of Apple Inc. (“Apple”/“Petitioner”). I understand that Apple is requesting that the Patent Trial and Appeal Board institute an *inter partes* review (“IPR”) proceeding with respect to U.S. Patent No. 10,656,758 (“the ’758 patent”) (EX1001).

2. I have been asked to provide my independent analysis of the ’758 patent in light of certain prior art publications, and I have done so based on my personal knowledge and experience.

3. I am not, and never have been, an employee of Apple. I received no compensation for this Declaration beyond my normal hourly compensation based on my time actually spent analyzing the ’758 patent, the prior art publications cited below, and various issues related thereto. I will not receive any added compensation based on the outcome of any IPR or other proceeding involving the ’758 patent.

II. QUALIFICATIONS

4. In formulating my opinions, I have relied on my knowledge, training, and experience in the relevant field. My education and experience are described more fully in the attached curriculum vitae (Appendix A). For ease of reference, I have highlighted certain information below.

5. My education and experience are described more fully in the attached curriculum vitae (Appendix A). I am a Professor at the Department of Computer Science and Software Engineering at the University of Canterbury, New Zealand. I also currently head the Human-Computer Interaction and Multi-Media research group at the University of Canterbury.

6. In 1988, I was awarded a Bachelor of Science with Honors in Computer Science from the University of York, England.

7. In 1993, I was awarded a Ph.D. from the University of Stirling, Scotland. My thesis was on “Computer Supported Cooperative Work,” which relates to forms of group interaction supported on computers.

8. In 1993, I joined the University of Canterbury as a Lecturer in the Department of Computer Science (now the Department of Computer Science and Software Engineering). I was subsequently promoted to a Senior Lecturer, and then an Associate Professor, before my appointment as a Professor in 2010. I currently hold the title of Professor.

9. I have over 30 years of experience in the area of Human-Computer Interaction. The field of Human-Computer Interaction is generally concerned with ways of understanding and improving the interaction between humans and computers, with an aim toward understanding, evaluating, designing, and building new styles of interactions that improve on one or more of the end goals of making

computers faster to learn, more intuitive, more efficient to use, and more subjectively satisfying.

10. Throughout my career, I have published the results of many research projects that have involved building new user interfaces or reviewing existing user interfaces for performing a particular task, and evaluating their effectiveness. This includes publications relating to:

- (a) investigating user experiences with web navigation interfaces, for example when using the “back” button on web browsers;
- (b) reviewing and improving various interface schemes for traversing through documents in computer applications, including zooming, scrolling, and other techniques;
- (c) analyzing new interfaces for text entry on mobile and touch-sensitive devices;
- (d) addressing the problems arising from the small form factor of mobile devices with touch-sensitive displays, including wearable technologies;
- (e) examining the influence of haptic feedback on user performance with mouse and touch screen input devices;
- (f) evaluating the importance of spatially stable displays in user interfaces; and
- (g) designing, analyzing and evaluating gesture-based input techniques for various user activities, including music data entry, web navigation, text entry, and scrolling.

11. I also have extensive experience in designing and building new user interfaces and reviewing existing user interfaces. This includes a number of projects regarding the design, development and evaluation of user interfaces that I have

undertaken with companies in the computing and Human-Computer Interaction industry, such as:

- (a) working with Airbus SAS in 2016 on methods to assist pilots' gesture-based interaction with touch screens in turbulent environments;
- (b) working with Hewlett-Packard Research Labs from 2010-2012 on the design and evaluation of gesture-based pointing techniques for remote displays, such as interactive TVs;
- (c) a number of projects from 2006-2010 working with Logitech on the design, development, evaluation and improvement of user interfaces for next generation mice, including in relation to scrolling and window management tasks;
- (d) working with IBM Almaden Research in 2006 on the design, development and evaluation of user interfaces for gesture-based text entry on mobile devices;
- (e) working with Digit Wireless in 2002 on the evaluation of user performance for user interfaces for digital text entry on mobile devices; and
- (f) working with Microsoft Research in 1999 on the development, evaluation and improvement of user interfaces for web browsing, in particular the mechanisms for revisiting pages (such as through the "back" button or bookmarks).

12. At the University of Canterbury, I currently teach a course on Human-Computer Interaction for final year undergraduate students and a course on research methods in Human-Computer Interaction for postgraduate students.

13. In the past, I have also taught introductory computer programming courses for first year students across disciplines, which included the implementation of graphical user interfaces.

14. I also manage an active research lab with a number of Ph.D. students. I have previously supervised fourteen students to successful completion of their Ph.D.s in the field of Human-Computer Interaction.

15. The Association for Computing Machinery (ACM) is the world's largest scientific and educational computing society. In 2015, I was elected to the ACM Conference on Human Factors in Computing Systems (CHI) Academy, which honors the principal leaders of the field of Human-Computer Interaction.

16. I also annually attend conferences relating to the field of Human-Computer Interaction and regularly read journals that cover research in the field of Human-Computer Interaction.

17. To keep abreast with industry trends, I regularly read broader journals, magazines and websites related to computer science and technology, including Communications of the ACM, ACM TechNews, BBC Technology, and New York Times Technology.

18. A detailed list of my other professional activities, memberships, and speaking engagements is included in my CV.

III. LEGAL PRINCIPLES

19. In forming my analysis and conclusions expressed in this Declaration, I have applied the legal principles described in the following paragraphs, which were provided to me by counsel for the Petitioner.

A. Person of Ordinary Skill in the Art

20. I understand that the factors considered in determining the ordinary level of skill in a field of art include: the level of education and experience of persons working in the field; the types of problems encountered in the field; the teachings of the prior art regarding solutions to such problems; and the sophistication of the technology at the time of the alleged invention. I understand that a person of ordinary skill in the art (“POSITA”) is not a specific real individual, but rather is a hypothetical individual having the qualities reflected by the factors above and knowledge of all relevant prior art references, including the references I cite below.

B. Obviousness

21. I have been informed that a patent claim is invalid as “obvious” in light of one or more prior art references if it would have been obvious to a POSITA at the time of the alleged invention, taking into account (1) the scope and content of the prior art, (2) the differences between the prior art and the claims, (3) the level of ordinary skill in the art, and (4) any so called “secondary considerations” of non-obviousness, which include: (i) “long-felt but unresolved need” for the claimed invention, (ii) commercial success attributable to the claimed invention, (iii) unexpected results of the claimed invention, and (iv) “copying” of the claimed invention by others.

22. While I do not know the exact date that the alleged invention of the '758 patent was made, I do know that the '758 patent's earliest claimed priority date is August 5, 2011. For purposes of my obviousness analysis, I have applied a date of August 5, 2011 as the date of the alleged invention ("Critical Date"), although in many cases the same analysis would hold true even if the date of the alleged invention were earlier or later.¹

23. I have been informed that a claim can be obvious in light of a single prior art reference or multiple prior art references. To be obvious in light of a single prior art reference or multiple prior art references, there must be a reason that would have prompted a POSITA to modify or supplement the single prior art reference, or to combine two or more references, in a manner that provides the elements of the claimed invention. This reason may come from a teaching, suggestion, or motivation to combine, or may come from the reference(s) themselves, the knowledge or "common sense" of a POSITA, or from the nature of the problem to be solved, and this reason may be explicit or implicit from the prior art as a whole. I have been informed that, under the law, the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield

¹ Note, however, that I do not concede that the '758 patent is entitled to its earliest claimed priority date.

predictable results. I also understand it is improper to rely on hindsight in making the obviousness determination.

24. I understand that an obviousness determination also requires that a POSITA would have had a reasonable expectation of success. This concept has been explained to me as relating to the relative likelihood or predictability—from the perspective of a POSITA—of successfully modifying the prior art in a manner that would meet the claimed limitations of the patent being challenged (here the '758 patent). I understand that the expectation of success need only be “reasonable” and, thus, does not require the absolute certainty gleaned from physically creating the proposed prior art modification.

C. Claim Interpretation

25. I understand that, for purposes of my analysis in this *inter partes* review proceeding, the terms appearing in the patent claims should be interpreted according to their “ordinary and customary meaning.” In determining the ordinary and customary meaning, I understand that the words of a claim are first given their plain meaning that those words would have had to a person of ordinary skill in the art at the time of the alleged invention. I also understand that the structure of the claims, the specification and file history may be used to better construe a claim. Moreover, I understand that even treatises and dictionaries may be used, albeit under limited

circumstances, to determine the meaning attributed by a person of ordinary skill in the art to a claim term.

IV. MATERIALS CONSIDERED

26. My analysis in this Declaration is based on my knowledge and experience. Based on my above-described qualifications in Section II, the Patent Trial and Appeal Board should consider me to be an expert in the field. Also, based on my experiences, I understand and know of the capabilities of persons of ordinary skill in this field.

27. As part of my independent analysis for this Declaration, I have considered the following: the '758 patent (EX1001) and its prosecution history (EX1002); the background knowledge/technologies that were commonly known to persons of ordinary skill; my own knowledge and experience gained from my work in the field; my experience in teaching and advising others in this field; and my experience working with others involved in this field. In addition, I have analyzed the following publications and materials:

EX1004	US 2011/0252372 (“Chaudhri”)
EX1005	US 2004/0051726 (“Martyn”)
EX1006	US 2011/0248948 (“Griffin”)
EX1007	US 2011/0167382 (“Os”)
EX1020	NEWTON MESSAGEPAD, MODELS: ORIGINAL (OMP) AND 100 (MP100), https://web.archive.org/web/19990202045806/https://msu.edu/~luckie/gallery/mp100.htm (1999)
EX1021	OF MICE AND MENUS: DESIGNING THE USER-FRIENDLY INTERFACE, IEEE Spectrum (1999)

EX1022	NEWTON 2.0 USER INTERFACE GUIDELINES (1996)
EX1023	US 7,479,949
EX1024	US 8,954,887
EX1025	US 2009/0244023
EX1026	US 4,885,565
EX1027	ACTIVE CLICK: TACTILE FEEDBACK FOR TOUCH PANELS (2001)
EX1028	SNAP-CRACKLE-POP: TACTILE FEEDBACK FOR MOBILE TOUCH SCREENS (2006)
EX1029	TACTILE FEEDBACK FOR MOBILE INTERACTIONS (2007)
EX1030	DESIGN AND EVALUATION OF IDENTIFIABLE KEY-CLICK SIGNALS FOR MOBILE DEVICES (2011)
EX1031	US 2006/0197753
EX1032	ISSUES AND TECHNIQUES IN TOUCH-SENSITIVE TABLET INPUT (1985)
EX1033	US 5,612,719
EX1034	US 2008/0036743
EX1035	US 8,830,181
EX1036	US 9,760,241
EX1037	ANDROID DEVELOPERS GUIDE, CREATING MENUS, https://web.archive.org/web/20110216140646/http://developer.android.com/guide/topics/ui/menus.html (2011)
EX1038	THE STATE OF THE ART OF MOBILE APPLICATION USABILITY EVALUATION (2012)
EX1039	USABILITY HEURISTICS FOR TOUCHSCREEN-BASED MOBILE DEVICES (2012)
EX1041	US 11/367,749
EX1042	EVOLUTION OF MOBILE DEVICES AND OPERATING SYSTEMS (2013)
EX1045	IPHONE USER GUIDE: FOR IPHONE OS 3.1 SOFTWARE (2009)
EX1046	US 2012/0319959
EX1047	NEWTON APPLE MESSAGEPAD HANDBOOK (1995)
EX1048	US 2007/0157089
EX1049	US 7,490,295

28. Note that my citations to non-patent literature throughout this Declaration reference the absolute page number added to the exhibit (as opposed to the original pagination of the document). For patent literature, I've used the

column/line numbers or paragraph numbers. Note also that, unless I've indicated otherwise, all emphasis (bold/italics/underline) in any quoted text are ones I have added.

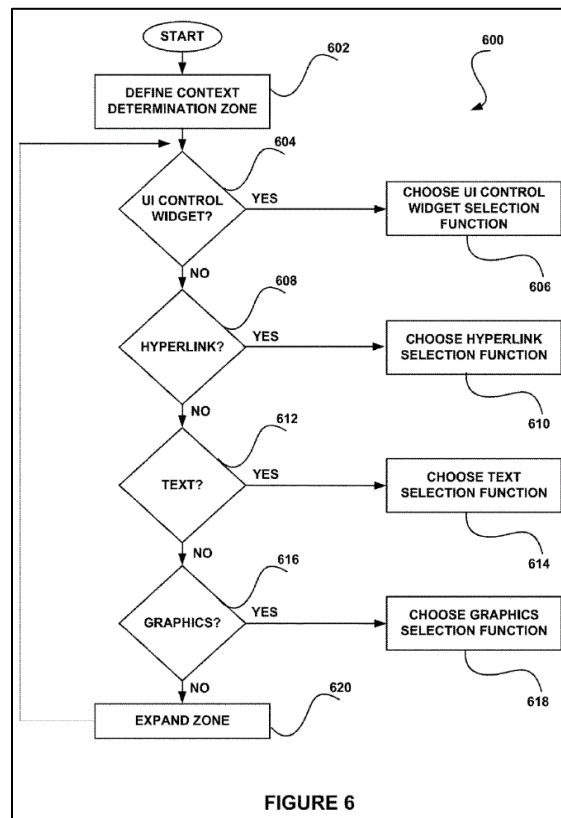
29. Although I cite and quote to selected portions of various references in this Declaration, the reader should understand that these citations are representative examples. A POSITA would have viewed each reference in its entirety and in combination with other references. Accordingly, I intend the references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

V. THE '758 PATENT

A. Pertinent Disclosure

30. The '758 patent relates to "touch screens" and describes embodiments where "a user experience [with a touch screen device] may be altered" based on a "touch signal." EX1001 ('758 patent), 1:38-39, 14:26-15:64, Figure 3.

31. In one such example, a method involves defining a "context determination zone" associated with the point or area of the user's touch contact and choosing an appropriate "selection function" based on the user interface elements within that zone. *See generally*, EX1001 ('758 patent), 26:41-35:53, Figure 6 (below). For example, as shown in Figure 6, the zone may include a "UI control widget," a "hyperlink," a block of "text," or one or more "graphics." EX1001 ('758 patent), 26:41-35:53, Figure 6 (below).



EX1001 ('758 patent), Figure 6

32. The “selection function,” when invoked, may trigger the display of a “menu” of context-specific selectable “items.” EX1001 ('758 patent), 30:49-58, 32:17-30, 34:5-19, 35:47-36:4, 84:37-55. “Once the desired menu item is highlighted, the user may execute a rapid increase in pressure to finalize the selection of that menu item.” EX1001 ('758 patent), 30:56-58.

33. As part of an “alternative method,” the '758 patent describes a sequence where the “attributes” of a “touch event” are used to detect a “gesture,” which can be “mapped to any command or operation of the device.” EX1001 ('758 patent), 53:61-56:20, Figure 16. A given “gesture may be associated with a variety of

different actions,” such as “scrolling a display or user interface element, zooming in or out, modifying the display brightness, and/or any other action.” EX1001 (’758 patent), 56:13-17. In one particular example, the ’758 patent explains that “a user may perform relocation operations on a selected object...by making contact with the object on an interaction surface...and dragging the contact point to relocate the object.” EX1001 (’758 patent), 56:62-57:8.

B. Claimed Subject Matter

34. The ’758 patent’s independent claims 1, 63, and 124 outline four scenarios regarding a user’s touch contact with an area of a mobile device touch screen that corresponds to “a first application icon.”

35. In the first scenario, where the user’s touch is applied for a duration less than a first time threshold, the device “launch[es] the first application.” See Element [1.i].

36. In the second scenario, where the user’s touch is applied for a duration greater than the first time threshold, the device displays “one or more action option objects associated with the first application.” See Element [1.j].

37. In the third scenario, where the user’s touch is applied for a duration greater than a second time threshold—which is greater than the first time threshold—the device “perform[s] an operation in connection with the first application icon.” See Element [1.k].

38. In the fourth scenario, where the user's touch meets a movement criteria, the device "mov[es] the first application icon in a foreground virtual display layer so that the first application icon appears to float above a background virtual display layer." See Element [1.1].

VI. PERSON OF ORDINARY SKILL IN THE ART

A. A POSITA's Ordinary Level of Skill

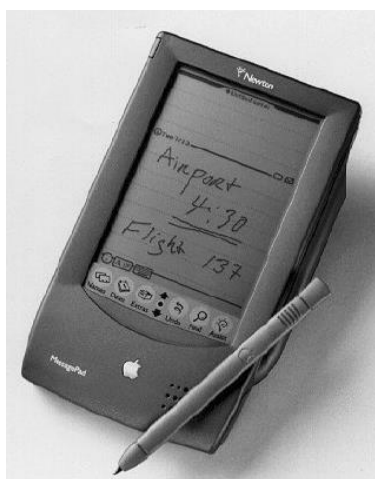
39. Based on my knowledge and experience in the field and my review of the '758 patent and its file history, I believe that a POSITA would have included a Bachelor of Science degree in computer science, computer engineering, or a comparable field and at least two years of professional experience working with graphical user interfaces and applications for computers. Such experience could be obtained through research and study in a graduate program or through comparable exposure through industry employment, and additional years of experience could substitute for the advanced-level degree.

40. My analysis and conclusions expressed in this Declaration are based on the perspective of a POSITA having this level of knowledge and skill. My education, technical expertise and personal knowledge discussed in Section II shows that I meet the qualifications of a POSITA.

B. A POSITA's Background Knowledge and Understanding of the Pertinent Technology

1. Touch Screen Mobile Computing Devices

41. The field of touch screen mobile devices (e.g., smartphones, tablets, and PDAs) was mature and robust by the time of the Critical Date in 2011. The emergent phase was long past and commercial adoption was in full swing. For example, Apple Inc.—the Petitioner in this case—introduced and marketed a touch screen PDA called the “Newton MessagePad” in 1993.² EX1020, p.1. In 2007, Apple launched a touch screen smartphone device—the revolutionary iPhone. See generally EX1045; <https://www.youtube.com/watch?v=x7qPAY9JqE4&ab>.



EX1020, p.6



EX1045, p.20

² At the time, Apple Inc. held a different name—i.e., Apple Computer Inc.

42. An industry leader in the field, Apple applied for numerous patents on touch screen mobile device technology. The '758 patent identifies several Apple patents and patent application that precede the Critical Date in 2011, suggesting that they “may or may not be incorporated into any of the embodiments disclosed herein.” EX1001 ('758 patent), 86:45-97:20. It cannot be reasonably disputed that the underlying technology and alleged innovations of the '758 patent had already been discovered and disclosed by Apple and others in the field by 2011.

2. Menus in Computer Graphical User Interfaces

43. Menus were a common feature of graphical user interfaces (GUIs) by the time of the Critical Date in 2011. A “menu” in this context is simply “a list of command options currently available to the computer user; some stay onscreen, while pop-up or pull-down menus are requested by the user.” EX1021, p.1. Some GUIs “use nested hierarchies of menus; others offer different menu versions—one with the most commonly used commands for novices, another with all available commands for the experienced user.” EX1021, p.4.

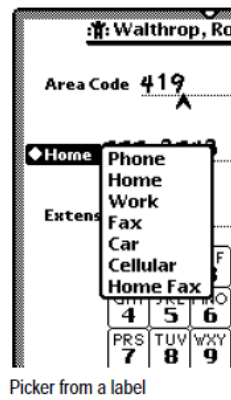
44. Like windows and icons, menus are among the central “ingredients of computer interfaces” and “are now an integral part of the user-friendly interface.” EX1021, pp.1, 4. Simply put, menus are an effective, time-tested solution to the problem in user-interface design of presenting available actions and functionalities for quick and efficient selection by the user. Because of GUI menus, “users no

longer need to refer to manuals or memorize available options”—“[i]nstead, the choices can be called up at a moment’s notice whenever needed.” EX1021, p.1, 4. This fact is one of many reasons personal computing has become a mainstay of modern technology and society.

45. The concept of using “[m]enus [to] list choices of action” in a GUI was developed in the 1970s by Xerox Corp’s Palo Alto Research Center (PARC), and advanced even further by Apple and others in the 1980s. EX1021, pp.1, 3-4. For example, Apple introduced a “menu bar”—i.e., a menu that appears as “a single bar” and “relates only to the window in use”—in its “Lisa” computer in 1983. EX1021, pp. 3-4. Moreover, Apple’s Newton MessagePad (1993) and iPhone (2007) touch screen mobile device products both heavily utilized menus in their respective GUIs. EX1022, pp. 128-141 (discussing “list picker” menus); EX1045, pp. 34 (text editing menus), 117 (contextual menu for Maps application), 128 (contextual menu for Voice Memos application). In my experience, by 2011, menus were a ubiquitous feature in computer GUIs, implemented in virtually all consumer personal computing devices, both mobile and desktop.



EX1022, p. 133



EX1045, p. 117



46. The '758 patent concedes that the notion of incorporating menus into the GUI of a touch screen mobile device had already been thoroughly disclosed by Apple. For example, the '758 patent references Apple's U.S. 7,479,949, entitled "Touch Screen Device, Method, and Graphical User Interface for Determining Commands by Applying Heuristics," which shows and describes numerous different contextual menus that appear and present the user with available options based on the state and operational mode of the device. EX1001 ('758 patent), 86:50; EX1023, Figures 17, 18I, 26E, 35F, 35I, 39K.

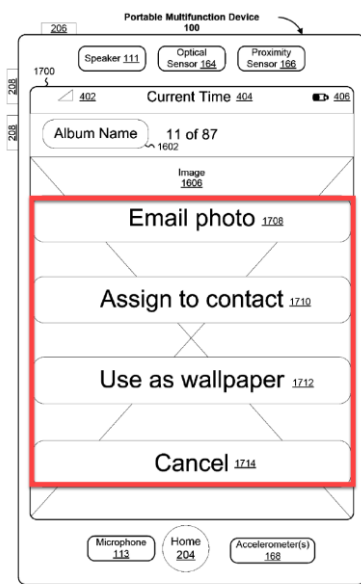


Figure 17

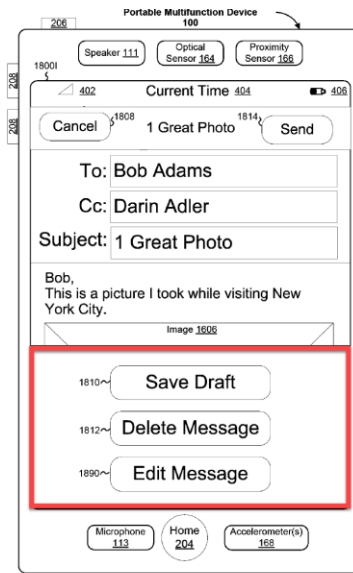


Figure 18I

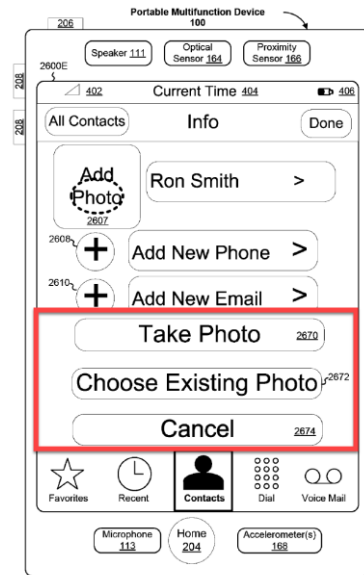


Figure 26E



Figure 35F

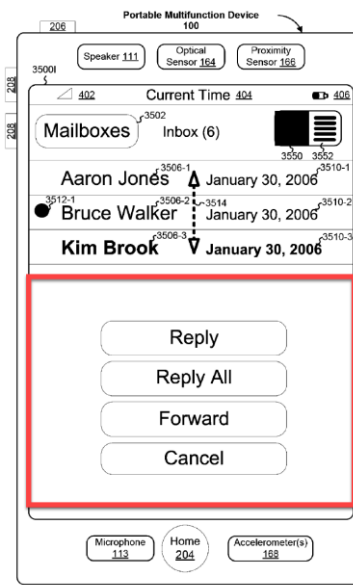


Figure 35I

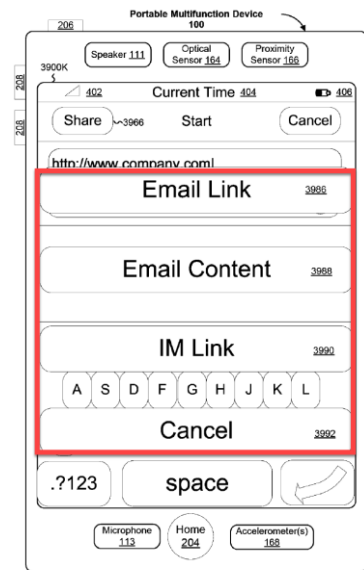
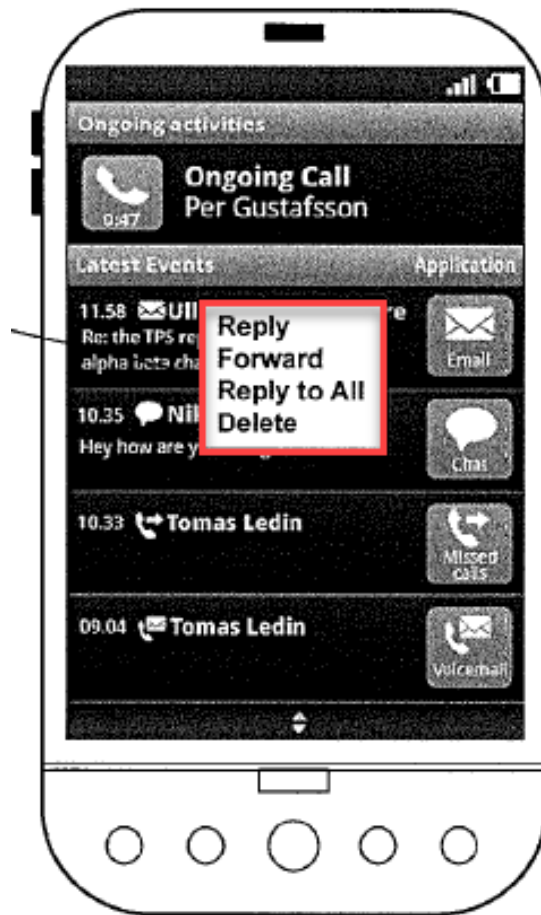


Figure 39K

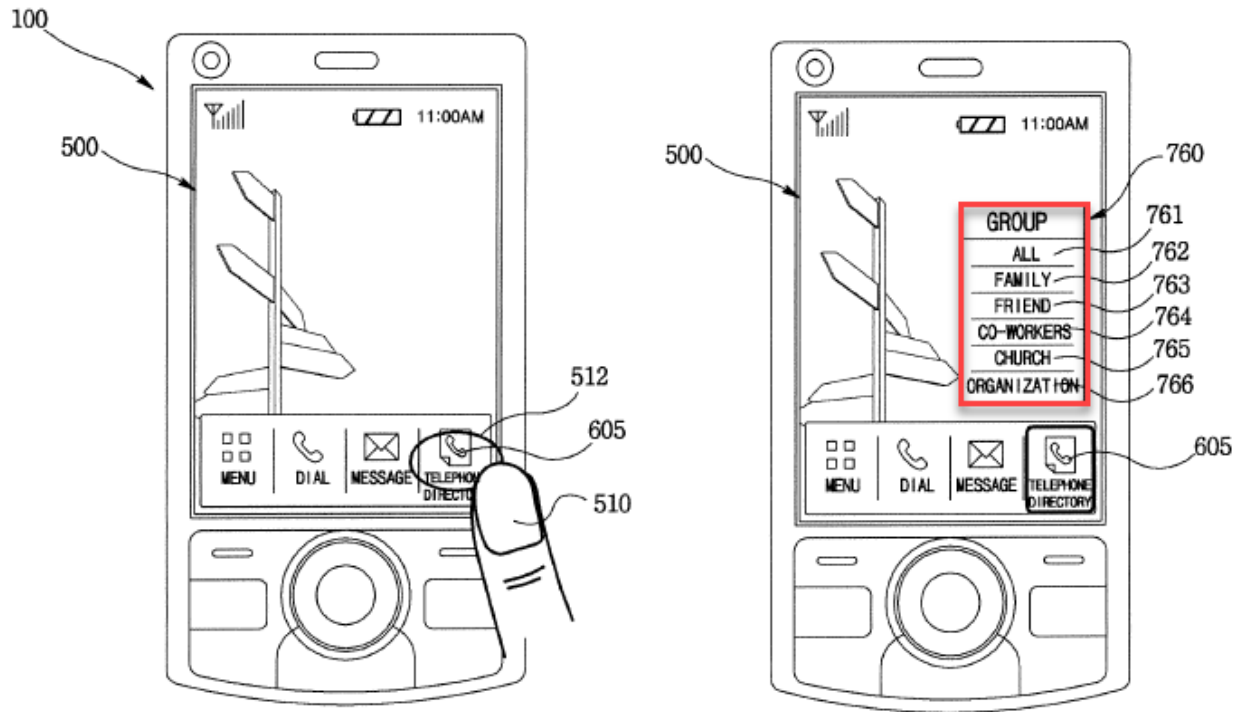
47. Even beyond Apple's '949 Patent, various other disclosures in the patent literature described touch screen GUIs with contextual menus before 2011. For example, U.S. 8,954,887, filed on February 9, 2009, described "a mobile telephone having a touch screen user interface," where a "long press selection" reveals "additional functionality" in the form of "a pop up control that a user may

then interact with”—e.g., “a pop up contextual menu that relates to an element in the display.” EX1024, 1:38-65; *see also* EX1024, 4:25-5:51, Figure 1 (excerpt featuring contextual menu below).



EX1024, Figure 1 (annotated)

48. As another example, US 2009/0244023, filed March 23, 2009, describes a touch screen mobile device where performing a “touch operation for a predetermined period of time” invokes “a second level menu.” EX1025, [0182-0183], Figures 12c-12d (illustrating menu).



EX1025, Figures 12c-12d (annotated)

3. Duration-Based Touch Gestures in Touch Screen Mobile Devices

49. It has long been the case that users can interact with a given GUI element in multiple different ways to access different operations and functions. For example, in a conventional desktop setting, a single mouse click may select an application icon, while a double mouse click on the icon may activate the corresponding application. GUIs for touch screen mobile devices likewise recognize distinct user touch inputs—called “gestures”—that serve as commands to trigger distinct operations.

50. The idea of detecting touch gestures is quite old. For example, a paper titled “Issues and Techniques in Touch-Sensitive Tablet Input” broached the subject

in 1985, decades before the 2011 Critical Date. EX1032, p.1-4. This 1985 paper described an exemplary touch gesture recognition technique that “would permit [the user] to select options from a menu, or activate light buttons by positioning the tracking symbol over the item and ‘pushing,’ which “is consistent with the gesture used with a mouse.” EX1032, p.3-4. Thus, the author surmised that a “touch tablet is capable of duplicating the behaviour [sic] of a one-button mouse.” EX1032, p.3-4.

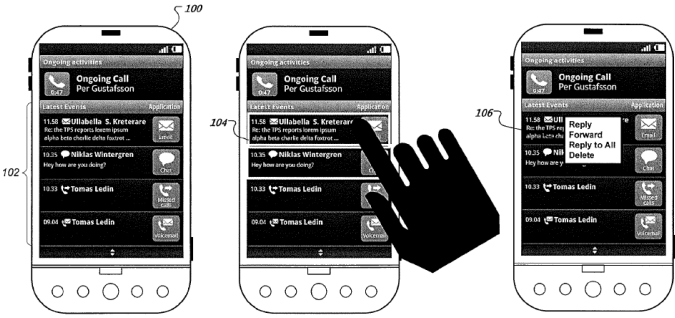
51. Over time, touch surface technology and gesture recognition techniques matured beyond that of a one-button mouse. For example, US 5,612,719, a patent filed in 1994 and issued in 1997 to Beernink et al., disclosed the concept of a “gesture sensitive button for a graphical user interface,” where executing different gestures—e.g., a tap, check-mark, or X-mark—on the button triggers different functionality. EX1033, Abstract, 2:5-45, Figures 8-9. Similarly, Apple’s pre-existing Newton MessagePad touch screen mobile device product was designed to distinguish between gestures based on the duration of a touch input—i.e., instances where the user interacts with a GUI element via a “tap” gesture versus a gesture where “the user presses and holds.” EX1022, p.84; *see also* EX1022, p.190 (“To select an object, a user holds down the pen on or near the object until a heavy mark appears under the pen and the Newton device makes a high-pitched sound.”), p.205 (“When

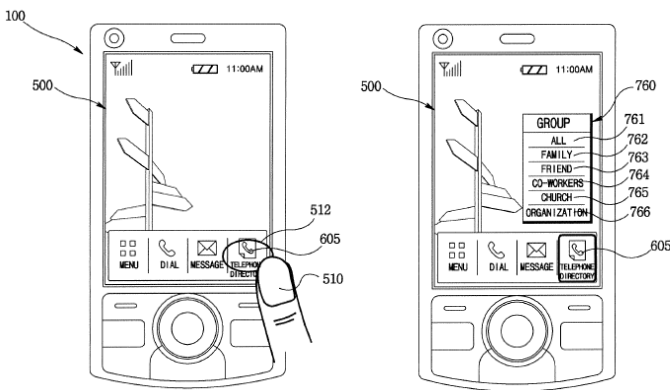
a user holds the pen on a key for a certain amount of time, the system acts as if the user were repeatedly tapping that key.”).

52. Prior art disclosures like Apple’s U.S. 2006/0197753 take gesture recognition a step further, leveraging the development of multi-touch touch screen technology and advancing robust “vocabularies” of touch gestures based on a “variety of variables including the UI mode, the force of the touch (e.g., light or hard), the number of fingers used, whether or not there is any movement during the touch, the duration of the touch, and the touch location, all or some of which can be combined to form a variety of behaviors and user feedback.” EX1031 (Hotelling), [0145], [0149], Figures 26, 27A-27B. Amongst various other gestures, an exemplary vocabulary of the ’753 Publication maps a “short” single-finger touch on a virtual button element with no movement (e.g., a tap) to the function of “execut[ing] the item clicked,” and maps a “LONG” single-finger touch with no movement (e.g., a touch-and-hold gesture) to the function of “bring[ing] up [a] context sensitive menu.” EX1031 (Hotelling), Figures 27A-27B.

53. Apple’s ’753 Publication is one of numerous prior art patent documents that describe duration-based touch gestures in touch screen mobile devices. The patent literature was replete with such disclosures, as demonstrated by the table below.

Document	Description
EX1034 US 2008/0036743 Inventors: Westerman, <i>et al.</i> Filed: Jan. 31, 2007	[0119]: The gesture event may include first order parameters such as motion, tapping, <u>dwell</u> , pressure and/or the like. The gesture event may also include <u>second order parameters</u> that define the first order parameters such as speed, direction, shape, <u>timing/duration</u> , length, and/or the like. Thereafter, in block 130, actions associated with gesture events can be implemented when gesture events are performed.
EX1024 US 8,954,887 Inventors: Tseng, <i>et al.</i> Filed: Feb. 9, 2009	5:11-17: <u>A user selection (e.g., by pressing on a touch screen interface)</u> of any of the messages may open the selected message. A user selection of an application icon next to one of the messages may open the full application, such as with the associated message opened in the application. Such actions may occur upon an up press event on the item when the user selects the item quickly. 5:35-45: <u>The third, and right-most, display shows the functionality generated by a long press by the user.</u> In this example, the functionality involves the generation of a contextual pop up menu 106 associated with the first message in the latest events area 102 that was long-pressed by the user. The menu is contextual because its content depends on the thing that was long pressed—here, the context involves basic operations that can be performed on the e-mail message that was selected (e.g., reply, forward, etc.). If a different event were selected, the contextual menu might have different values (e.g., it may not be possible to forward a missed telephone call).

Document	Description
	 EX1024, Figure 1 8:66-9:19: <u>At box 404, the process 400 determines whether sufficient time has expired for a long press period on the device.</u> If such a time period has not yet expired, the process 400 determines whether the selected item exhibits long press functionality (box 405). If it does not, the process 400 simply continues waiting for an up press event. If the selected item does exhibit long press functionality, the selected item is shown in highlighted form on the display (box 406)...<u>Once the long press period has expired (box 404), the process 400 may cause a contextual menu to be displayed on the device.</u> Such a menu may include a pop up menu that appears over or near the selected item or at the point where the selection occurred, for example (box 408).
EX1035 US 8,830,181 Inventors: Clark, <i>et al.</i> Filed: Jun. 1, 2009	2:63-67: In one embodiment, a gesture recognition system identifies gestures based on characteristics such as the <u>duration of the contact, start and end times of the contact,</u> acceleration of motion of the contact, direction of motion of the contact, or a path of motion of the contact. 11:19-24: The gesture recognition unit 102 may further distinguish between a tap and a touch by comparing the duration of the contact with a maximum duration for a tap, or a minimum duration for a touch. For example, the <u>gesture recognition unit may detect any non-moving contact with a duration of less than 500 milliseconds as a tap, rather than a touch.</u>

Document	Description
	16:42-48, Figure 14: At block 1409, <u>in response to identifying the gesture, gesture recognition unit 102 executes instructions associated with the identified gesture.</u> For example, a particular gesture may be associated with a function such as, for example, moving objects in a GUI, playing sounds or displaying images, activating relays or other switches, or initiating transmissions of data.
EX1025 US 2009/0244023 Inventors: Kim, <i>et al.</i> Filed: Mar. 23, 2009	[0182] FIG. 12c illustrates a graphic user interface provided to <u>a touch screen</u> during proximity touch operation of an input medium according to another embodiment of the present invention. [0183] A selection marker 512 of FIG. 12c defines an area where an input medium 510 has proximity-touched the telephone directory execution icon 605 displayed on the touch screen 500 within a touch identification distance of the touch screen 500. <u>The controller 180 determines that the input medium 510 has performed the proximity touch operation for a predetermined period of time and may display on the touch screen 500 a second level menu for providing a function associated with the telephone directory execution icon 605, as illustrated in FIG. 12d.</u>  EX1025, Figures 12c-12d

Document	Description
EX1036 US 9,760,241 Inventors: Lewbel Filed: Nov. 5, 2010	13:44-55: FIGS. 9A-9B illustrate an example of <u>variable tactile output in response to detection of a time duration of a touch input applied to the display 202 and/or the touch sensor 204</u>. For example, as illustrated in FIG. 9A, when a user's finger 902 touches the surface 904 of the display 202 for a first time duration T_1, a first intensity level or type of localized tactile output 906 may be provided as indicated by the broken lines. On the other hand, as illustrated in FIG. 9B, when the user's finger 902 touches the display 202 (at the same or different location) for a second, longer duration of time T_2, a second, different level or type of localized tactile output 908 may be provided as indicated by the broken lines. FIG. 9A FIG. 9B EX1036, Figures 9A-9B 14:5-16: In one example, an eBook or other content item may include an image 910 having a particular feature 912 displayed on the display 202. When the user's finger 902 touches the particular feature 912 for <u>a first duration of time T_1</u>, a first type or intensity of tactile output may be generated, <u>the feature 912 may change visually to a first configuration, and the electronic device may produce a first sound</u>. When the user's finger 902 continues to touch the particular feature 912 until <u>the second duration of time T_2</u> is

Document	Description
	reached, a second type or intensity of tactile output may be generated, <u>the feature 912 may change visually to a second configuration, and the electronic device may produce a second sound.</u>

VII. OVERVIEW OF CONCLUSIONS FORMED

54. This Declaration explains the conclusions that I have formed based on my independent analysis. To summarize those conclusions: based upon my knowledge and experience, and my review of the materials listed above, I believe that Claims 1, 9, 12, 19-22, 24-32, 35-43, 47, 57-59, 63, 71, 74, 81-84, 86-94, 97-105, 109, 119-121, 124 of the '758 patent are obvious: (1) in view of Chaudhri (EX1004), Martyn (EX1005), and Griffin (EX1006) (*see* Ground 1 at Section VIII); and (2) in view of Chaudhri, Martyn, Griffin, and Os (EX1007) (*see* Ground 2 at Section IX).

VIII. GROUND 1: CHAUDHRI, MARTYN, GRIFFIN

A. Chaudhri (EX1004)

55. Chaudhri describes user interfaces for mobile computing devices with touch-sensitive surfaces, such as touch screen displays. EX1004 (Chaudhri), [0003-0004], [0007-0008], [0073]. As shown below, Figure 4A illustrates a user interface page including a background wallpaper layer providing the backdrop for “a menu of applications,” each represented by a corresponding “application icon.” EX1004

(Chaudhri), [0180], [0215], [0366], [0368]. When the device detects a touch input associated with one of the application icons, it determines a responsive action based on certain gesture characteristics of the touch. EX1004 (Chaudhri), [0102], [0174], [0216-0217], [0276], [0280], [0302], [0310-0311], Figures 4A, 5A-B, 7A-B.

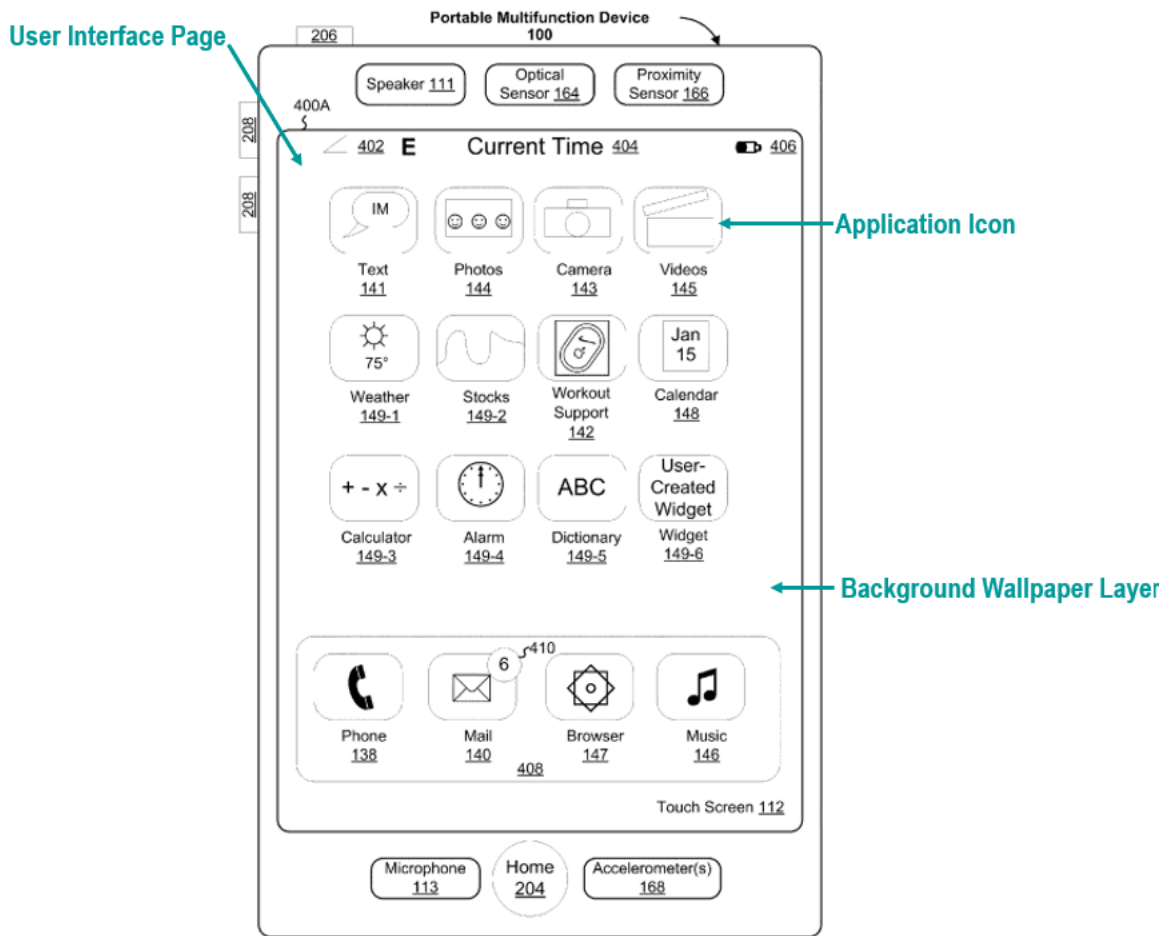
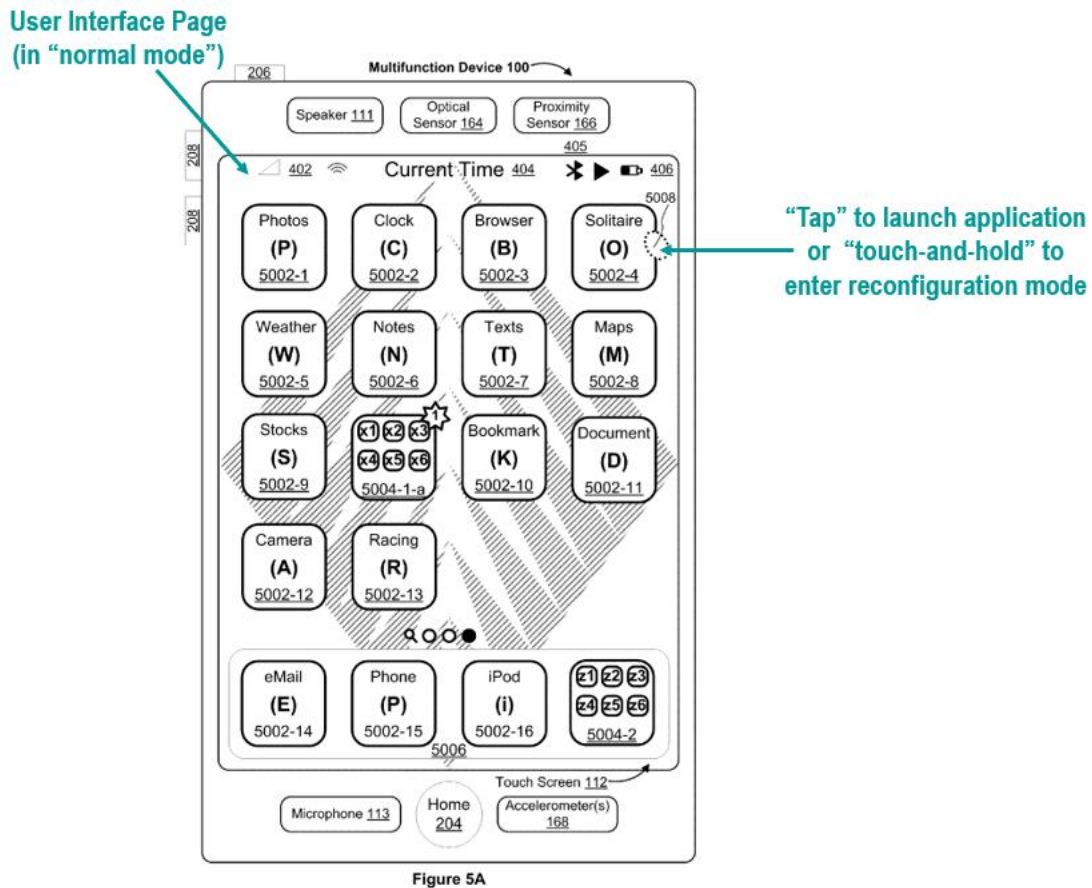


Figure 4A

EX1004 (Chaudhri), Figure 4A (annotated)

56. In the “normal” mode of operation for the application menu interface, Chaudhri’s device launches an application when the matching icon is selected with a “tap” gesture (also colloquially called a “short touch”). EX1004 (Chaudhri),

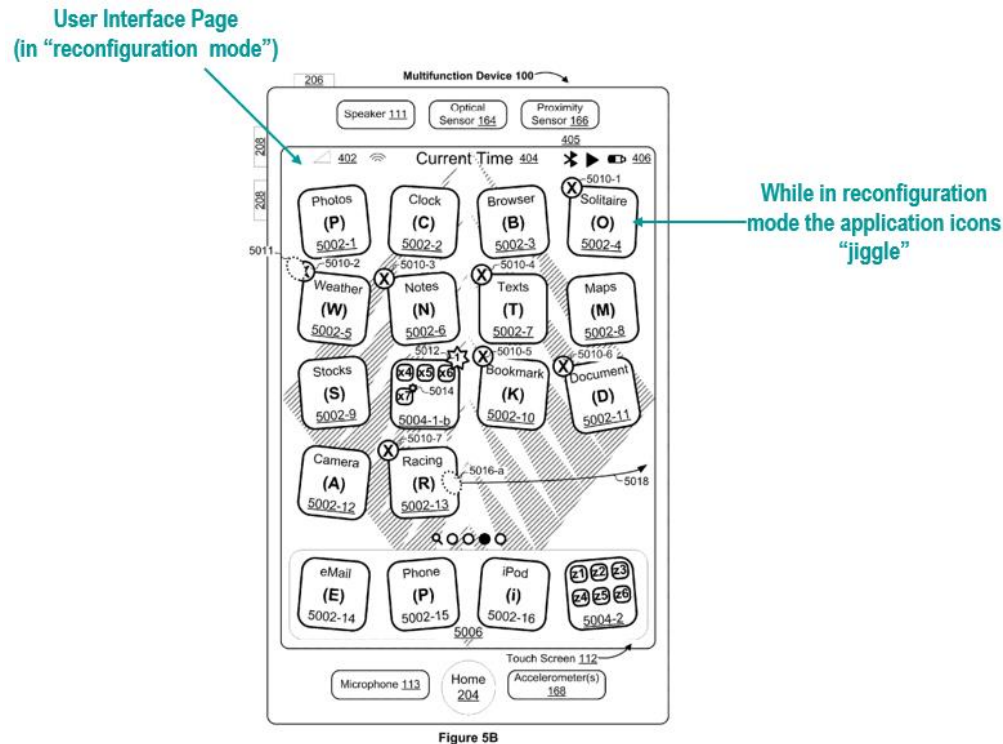
[0101-0102], [0174], [0217], [0276], [0280], [0289], [0302], Figure 5A. Using Figure 5A (below) to illustrate this rudimentary concept, Chaudhri explains that “detecting a tap gesture 5208 at a location on the touch-sensitive surface that corresponds to the photos [application] icon...launch[es] the photos application.” EX1004 (Chaudhri), [0276].



EX1004 (Chaudhri), Figure 5A (annotated)

57. In addition to the “tap” gesture, Chaudhri’s device also recognizes and responds to a touch-and-hold (also colloquially called a “long touch”) at an application icon. EX1004 (Chaudhri), [0217-0218], [0313], Figures 5B, 7A, 7B.

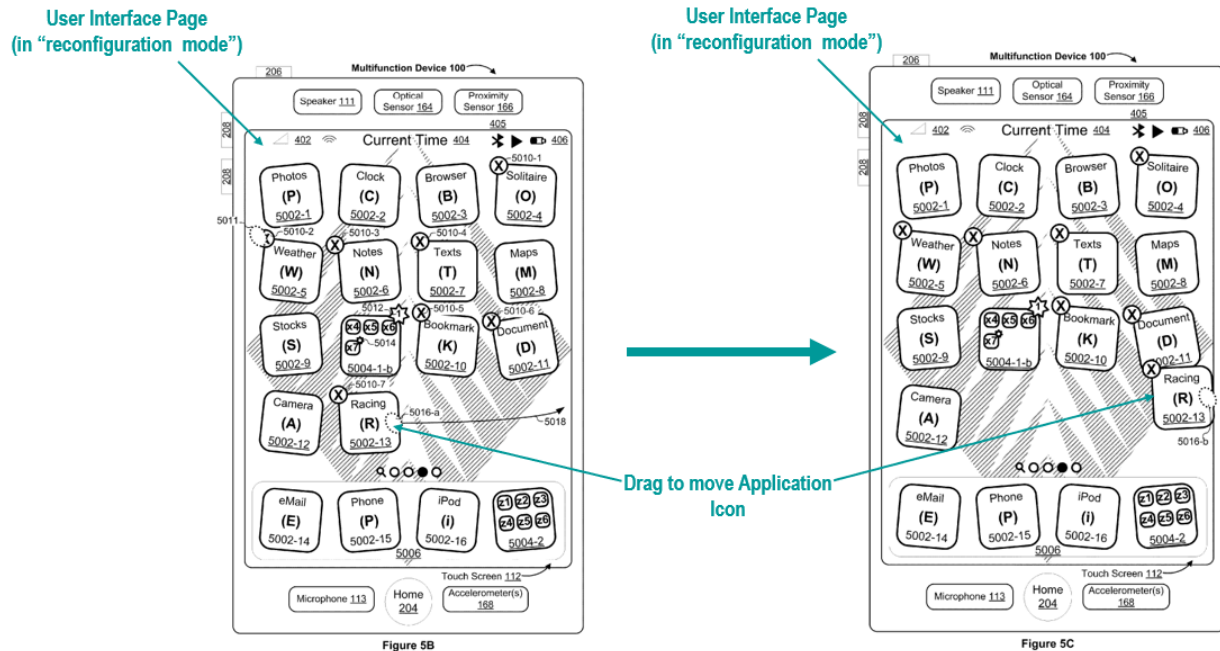
For example, if the duration of the user's touch at the photos application icon persists for "more than a predetermined period of time (e.g., 2 seconds)...the device enters a user interface reconfiguration mode" for reorganizing the application menu. EX1004 (Chaudhri), [0217], Figures 5A-B. As a signal to the user that the device is in the "reconfiguration mode," the application icons on the menu "jiggle as though they are floating on water." EX1004 (Chaudhri), [0218].



EX1004 (Chaudhri), Figure 5B (annotated)

58. While the interface for the application menu is in the "reconfiguration mode," Chaudhri's device recognizes yet another gesture—a drag—as a command to move an application icon. EX1004 (Chaudhri), [0087], [0101], [0218], [0220], [0328-0331], Figures, 5B-C, 9A-9B, 5KK-5MM. For example, as illustrated in

Figures 5B and 5C (below), when the device detects a touch “at a location that corresponds to a ‘racing’ [application] icon” coupled with “subsequent movement” of the touch “to the edge of the touch-sensitive surface,” the icon is likewise “moved to the edge of the display.” EX1004 (Chaudhri), [0220].



EX1004 (Chaudhri), Figures 5A-B (annotated)

B. Martyn (EX1005)

59. Martyn’s disclosure “relates to a computing device with an improved user interface for applications.” EX1005 (Martyn), [0002]. Like Chaudhri, Martyn is particularly concerned with improving “mobile” devices having “small screens.” EX1005 (Martyn), [0002], [0004]. According to Martyn, “[o]ne of the problems facing the designers” of these small-screen mobile devices “is how to allow the user to navigate quickly and efficiently...activate a desired function.” EX1005 (Martyn),

[0002], [0004]. To solve this problem, Martyn promotes the use of a shortcut/contextual sub-menu—i.e., “a snap-shot view which brings together, in one summary window, a limited list of common [application] functions.” EX1005 Martyn, [0015]. This “summary window,” which Martyn calls an “App Snapshot,” is accessible directly from the “App Launcher” main page by executing “a press and hold...when an application name is highlighted.” EX1005 (Martyn), [0015-0018]. “When an item in the App Snapshot is selected...[t]he required application may be automatically opened.” EX1005 (Martyn), [0015-0018].

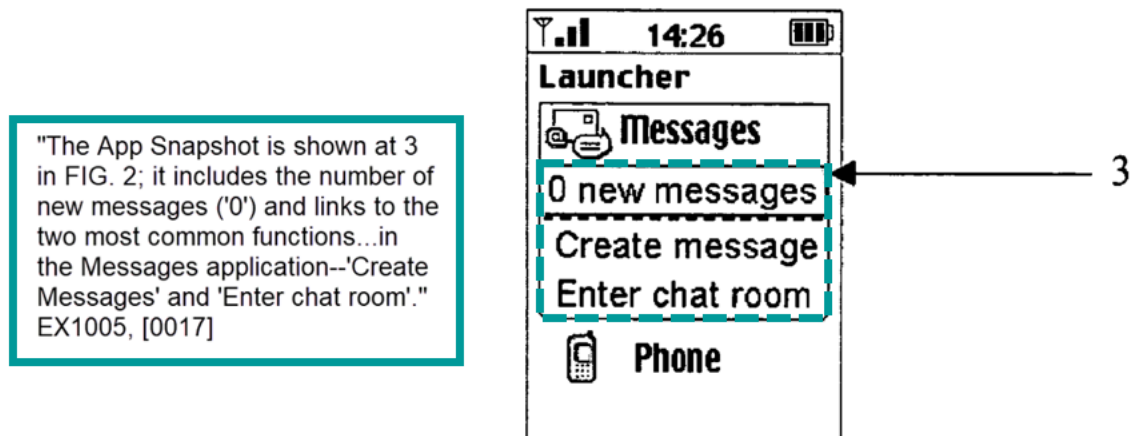


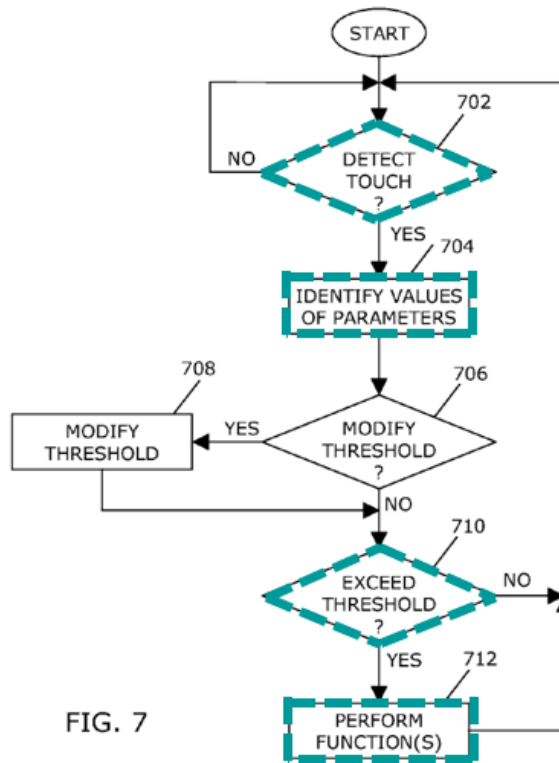
Figure 2

EX1005 (Martyn), Figure 2 (annotated)

C. Griffin (EX1006)

60. Griffin discloses the concept of applying “touch thresholds” to certain monitored “parameters” of the user’s contact with the touch screen of a mobile device. EX1006 (Griffin), [0032], [0040], [0053]. Based on a comparison between

the value of a touch parameter and a given threshold criterion, the device performs a corresponding functionality, as demonstrated in the flow chart below from Griffin's Figure 7. EX1006 (Griffin), [0053]. In this way, the user can access a variety of different functions by varying the duration, force, and/or area of contact.



EX1006 (Griffin), Figure 7 (highlighted)

D. The Chaudhri-Martyn-Griffin Combination

61. The Chaudhri-Martyn-Griffin combination represents the predictable result of applying in the context of Chaudhri's user interface for a touch screen device: **[a]** Martyn's teachings about providing a contextual shortcut sub-menu of common application functions in response to a press-and-hold user input; and **[b]**

Griffin's teachings about evaluating a user's touch input against predetermined threshold criteria.

62. From a POSITA's perspective in 2011, integrating the supplemental teachings of Griffin and Martyn with Chaudhri would have been nothing more than applying known solutions to known problems in the field of computer interfaces and applications to achieve predictable outcomes. In other words, Martyn's teachings about displaying a contextual sub-menu and Griffin's teachings about duration thresholds are all consistent with the POSITA's background knowledge and understanding as of 2011, a relevant portion of which I described above at Sections VI.B.2 (menus), and VI.B.3 (duration-based touch gestures). Supplementing Chaudhri's disclosure about user interfaces for touch screen mobile devices would have been simple and straightforward for a POSITA. The fundamental aspects of Chaudhri's disclosure would remain intact, bolstered by the well-known and beneficial teachings of Griffin and Martyn to successfully arrive at the '758 patent's claimed invention.

1. Reasons to Combine

(i) Applying Martyn's teachings regarding a summary window menu in the context of Chaudhri's user interface for a touch screen device

63. Multiple reasons would have motivated a POSITA to integrate Martyn's teachings about providing a contextual shortcut sub-menu in the form of a

“summary window” of common application functions (an “App Snapshot”) in response to a press-and-hold user input with Chaudhri’s disclosure of a touch screen mobile device with a user interface for displaying and reorganizing a menu of selectable application icons. The POSITA would have understood that the analog to Martyn’s press-and-hold input on a touch screen like Chaudhri’s is the well-known touch-and-hold gesture.³ Accordingly, the predictable result of the Chaudhri-Martyn combination is a mobile device featuring an application menu user interface that displays a contextual sub-menu, such as Martyn discloses, in response to a touch-and-hold gesture applied to Chaudhri’s touch screen. The following independent reasons support the Chaudhri-Martyn combination.

64. First, providing a sub-menu of selectable options corresponding to commonly used application functions was a ubiquitous feature in computer GUIs by 2011. Indeed, so-called “shortcut” or “contextual” sub-menus of this type had been a core feature in GUIs for decades by that time. Such sub-menus were an exceedingly well-known solution to the equally well-known problem of presenting contextually relevant and available actions and functionalities for selection by the user based on the state of the device. Martyn employs a contextual shortcut sub-

³ As I explained above, touch-and-hold gestures were well known in 2011. *See e.g.*, Section VI.B.3. Additionally, a touch-and-hold gesture on a touch screen is analogous to a press and hold of a physical button.

menu to augment a “main menu listing some or all applications” of a mobile device (EX1005 (Martyn), [0015]), and it would have been obvious for a POSITA to do the same in the context of Chaudhri’s user interface for “a menu of applications” (EX1004 (Chaudhri), [0180], Figure 4A). As I explained above at section VI.B.2, GUI menus date back at least to the 1970s and were subsequently implemented by skilled artisans in a variety of different forms (e.g., pop-up, drop down, toolbar, etc.) and in a variety of different settings, including touch screen mobile devices like Apple’s Newton MessagePad (1993) and iPhone (2007). In the context of touch screen mobile devices, a POSITA would have known that “[a]ll but the simplest applications have menus.” *See also* EX1037 (ANDROID DEVELOPERS GUIDE, CREATING MENUS), pp. 1 (“Menus are an important part of an application that provide a familiar interface for the user to access application functions and settings.”) (defining “Context Menu” as “[a] floating list of menu items that appears when the user performs a long-press on a View”), 4 (discussing the topic of “Creating a Context Menu”).

65. Described in the technical literature as one of the central “ingredients” of a “user-friendly interface,” menus were an exceedingly well-known solution to the equally well-known problem of presenting available actions and functionalities for selection by the user. EX1021, pp.1, 4. Martyn employs a contextual sub-menu to access common functions of an application, and it would have been axiomatic for

a POSITA to do the same in the context of Chaudhri's user interface for a "menu of applications."

66. Second, a POSITA would have recognized that applying Martyn's teaching of a contextual sub-menu would predictably improve Chaudhri's user interface for "a menu of applications" from a usability standpoint. EX1038, p.2 (identifying "Contextual Menus" as one of the "characteristics" relevant to "the usability of mobile devices"). Specifically, it would have been apparent to the POSITA that providing a sub-menu of options for invoking common application functions, as Martyn teaches, would allow the user to accomplish recurring tasks more quickly and efficiently (e.g., with fewer user inputs). Reducing the user's cognitive load by displaying common functionalities in a sub-menu would make Chaudhri's device and its user interface for a "menu of applications" easier to use. EX1039, p.3 (explaining certain "usability heuristics...for touchscreen-based mobile devices" that include "minimiz[ing] the user's memory load by making objects, actions, and options visible" and "provid[ing] shortcuts to the most frequent tasks").

67. As the POSITA would have known, usability in this context—e.g., the degree to which a given user interface efficiently facilitates the user's desired task—was a key differentiator amongst competing user interfaces for touch screen devices. The superior user interface from a usability standpoint would be more desirable by

consumers. As detailed in a contemporaneous technical paper entitled “The State of the Art of Mobile Application Usability Evaluation”:

Mobile devices and their applications provide significant advantages to their users, in terms of portability, location awareness, and accessibility. Lower price points and improvements in the hardware and software capabilities of smartphones in particular, the so-called “handhelds,” have led to tremendous expansion of the mobile and related markets. This has led to huge numbers of mobile applications (“apps”) being developed over the past few years.

This vast and increasing number of mobile apps in the marketplace has challenged developers to develop apps of superior quality in order to compete [1]. There are many aspects to the quality of mobile apps, an important one being usability.

EX1038, p.1.

68. Third, Martyn identifies specific “advantages” of the “App Snapshot” contextual sub-menu over other known techniques for accessing a desired functionality on a small-screen mobile device. EX1005 (Martyn), [0004-0008], [0015]. Where other techniques require the user to navigate between “many layers” and/or only show “one option...at any one time,” Martyn’s App Snapshot “brings together, in one summary window, a limited list of common functions,” which “yields many advantages in ease and speed of navigation.” EX1005 (Martyn), [0004-0008], [0015]. Understanding the similarities between Chaudhri and

Martyn's respective multi-functional mobile devices, the POSITA would have sought to predictably improve Chaudhri's interface for accessing desired application functions in the same way Martyn did—i.e., via a contextual shortcut sub-menu.

69. Fourth, the POSITA would have been prompted to pursue a combination with Martyn based on Chaudhri's suggestions to do so. For example, Chaudhri teaches the notion of displaying a contextual "pop-up dialogue" sub-menu that "provides the user with options for modifying the selectable user interface object." EX1004 (Chaudhri), [0274], [0317] (discussing "a contextual menu"), Figure 5LLL. This disclosure by Chaudhri would have prompted a POSITA to seek out and apply the teachings from other references in the same field, like Martyn, that describe analogous implementations of contextual sub-menus to augment a user interface for a multi-functional mobile device. Martyn's straight forward discussion about presenting commonly used application functions as selectable sub-menu options in an App Snapshot/summary window is a natural and obvious extension of Chaudhri.

(ii) Applying Griffin's concept of evaluating a user's touch against predetermined threshold criteria in the context of Chaudhri's user interface for a touch screen device

70. As discussed above in Sections VIII.A and VIII.C, Griffin and Chaudhri both describe touch screen mobile devices where different functionalities are triggered based on the characteristics of the user's contact with a touch screen.

Where Chaudhri (as supplemented by Martyn) provides a set of distinct functionalities invoked through specific touch gestures on an application icon, Griffin provides additional information regarding the underlying concept of evaluating the user's touch against predetermined threshold criteria. For example, Griffin provides an exemplary process flow for tracking touch contact, evaluating parameters of the contact (e.g., duration and/or location) against threshold criteria, and determining the corresponding device functionality based on the evaluation. EX1006 (Griffin), [0032], [0040], [0053]. For at least the following independent reasons, a POSITA would have had multiple reasons to pursue a predictable combination that supplements Chaudhri's disclosure based on Griffin's rudimentary concept of evaluating the parameters of a touch input against predetermined threshold criteria.

71. First, Chaudhri's instruction to trigger specific functionalities based on the duration of the user's touch contact on an application icon—e.g., a tap gesture to launch an application and a touch-and-hold gesture to trigger the reconfiguration mode as discussed above in Section VIII.A—would have prompted a POSITA to seek out and apply the teachings from references in the same field, like Griffin, that provide additional information on this subject. From the POSITA's perspective, the straightforward discussion in Griffin about tracking touch duration and evaluating the touch duration against predetermined threshold criteria are implicit and/or

expressly suggested by Chaudhri. In short, the POSITA would have been motivated by Chaudhri's teachings and suggestions to pursue this predictable combination with Griffin.

72. To explain further, Chaudhri describes having the device entering configuration mode in response to detecting a contact "for more than a predetermined period of time (e.g., 2 seconds)." EX1004 (Chaudhri), [0217]. A POSITA reading Chaudhri would, therefore, face the simple design problem of determining when the contact reaches or exceeds the "predetermined period of time." The solution to that problem would have been evident to the POSITA—track the touch duration and compare the duration to a threshold that reflects the "predetermined time." This solution is precisely what Griffin teaches.

73. In short, the POSITA would have been motivated by Chaudhri's teachings and suggestions to pursue a predictable combination that incorporates the rudimentary implementation details provided by Griffin.

74. Second, a POSITA would have appreciated that Griffin's implementation details were all well-known techniques. As I explained in detail above at Section VI.B.3, the prior art was replete with literature describing duration-based touch gestures and real-world products employing the same. Like Griffin, the pertinent literature on this subject described the common-sense solution of recognizing a touch-based gesture by tracking the duration of the user's touch and

comparing the duration to a predetermined threshold. EX1035, Abstract, 4:17-20, 16:26-41 (“comparing a duration of a contact with a range of durations”), Figure 14. Applying Griffin’s basic implementation details for touch-based gesture recognition in the context of a similar reference like Chaudhri to obtain a substantially similar result would have been obvious.

(iii) The Chaudhri-Martyn-Griffin combination

75. As I discussed above in Section VIII.A, the application menu user interface of Chaudhri’s mobile device begins in the “normal operation mode” and uses the well-known technique of launching an application in response to a “tap gesture” at an application icon. EX1004 (Chaudhri), [0217-0218]. Chaudhri further describes how the device transitions from the “normal operation mode” to a “reconfiguration mode” when the user executes a touch-and-hold gesture at the application icon—i.e., a touch that exceeds the criterion of a “predetermined period of time (e.g., 2 seconds).” EX1004 (Chaudhri), [0217]. Additionally, as a result of integrating Martyn’s teachings, the device provides the further functionality of responding to a touch-and-hold gesture at the application icon by displaying a contextual sub-menu comprising an App Snapshot summary window. EX1005 (Martyn), [0015-0018]; *above*, Section VIII.B.

76. Presented with three distinct operations invoked by duration-based touch gestures at an application icon—namely, [1] a tap to launch the application,

[2] a touch-and-hold to trigger a contextual sub-menu, and [3] another touch-and-hold to transition into the reconfiguration mode—the POSITA would have sought a solution to the problem of distinguishing between the different gesture commands. Thus, the POSITA would have looked to incorporate Griffin’s teachings to evaluate a duration parameter of the user’s touch against certain predetermined threshold criteria. *Above*, Section VIII.D(ii); EX1006 (Griffin), [0032], [0040], [0053]. Establishing such criteria would have been simple for a POSITA exercising common sense and ordinary creativity in view of the problem to be solved.

77. As a POSITA would have known, the “tap” gesture Chaudhri describes for launching an application in the “normal” mode is widely understood to connote a touch contact that ends within a short duration of time and, accordingly, a conventional technique for detecting a “tap” includes a criterion that the duration of the user’s touch contact is less than a first time threshold. *See above* Section VI.B.3; EX1035, 11:19-24 (describing a “gesture recognition unit” that distinguishes “between a tap and a touch” by comparing the duration of the contact, for example “the gesture recognition unit may detect any non-moving contact with a duration of less than 500 milliseconds as a tap, rather than a touch”); EX1033, 5:57-59 (defining a “tap” as “the placement of the tip of the stylus 38 on the screen 42 and its subsequent removal within a pre-determined period of time”); EX1046 (Saponas), [0027] (describing that “[v]arious types of touches may occur, including a tap (which

is defined as a single touch lasting less than or equal to a predetermined time)”). Next, understanding that Martyn’s contextual sub-menu “summary window” is related to selecting and launching the application (i.e., assisting the user with selecting a desired application functionality), the POSITA would have appreciated that this operation should likewise be part of the “normal” mode. Accordingly, the POSITA would have known to implement the duration criterion for the corresponding touch-and-hold gesture as being greater than the first time threshold of the tap, while also less than a second time threshold beyond which the interface transitions out of the “normal” mode and into the “reconfiguration” mode.

2. Reasonable Expectation of Success

78. A POSITA would have reasonably expected a successful outcome from the above-discussed combination of teachings from Chaudhri, Martyn, and Griffin. This conclusion is supported by my prior discussion on the POSITA’s background knowledge at Section VI.B and my prior discussion on motivation-to-combine at Section VIII.D.1. As I have explained, the user interface features involved in the Chaudhri-Martyn-Griffin combination—e.g., contextual sub-menus and duration-based touch gestures—were all very well known and widely adopted by 2011. A POSITA bringing these well-known features together in the manner I’ve proposed would have been reasonably certain that the result of the combination would arrive at the purported invention of ’758 patent (as outlined below in Section VIII.E). The

POSITA would have also understood that these integrated features are fully compatible and would work in combination in the same (or substantially the same way) that they work individually.

E. Claim Element Analysis

1. Claim 1

(i) Element [1.pre] An electronic device, comprising:

79. The Chaudhri-Martyn-Griffin combination renders obvious Element [1.pre] and Claim 1 as a whole. For example, Chaudhri explains that the disclosed embodiments “relate generally to **electronic devices**.” EX1004 (Chaudhri), [0003], [0009] (“a multi-function device”), [0074] (“a computing device”), Figures 2-3.

(ii) Elements [1.a] a display; [1.b] a touch-sensitive surface;

80. The Chaudhri-Martyn-Griffin combination renders obvious Elements [1.a], [1.b], and Claim 1 as a whole. For example, Chaudhri discloses “a computing device that includes **a display** and **a touch-sensitive surface**.” EX1004 (Chaudhri), [0074], *see also* [0009], [0074], [0078] (“Touch-sensitive display 112 is sometimes called a ‘touch screen’ for convenience, and may also be known or called a touch-sensitive display system.”), [0177], Figures 1A (“Touch-Sensitive Display System 112”), 1B, 2, 3.

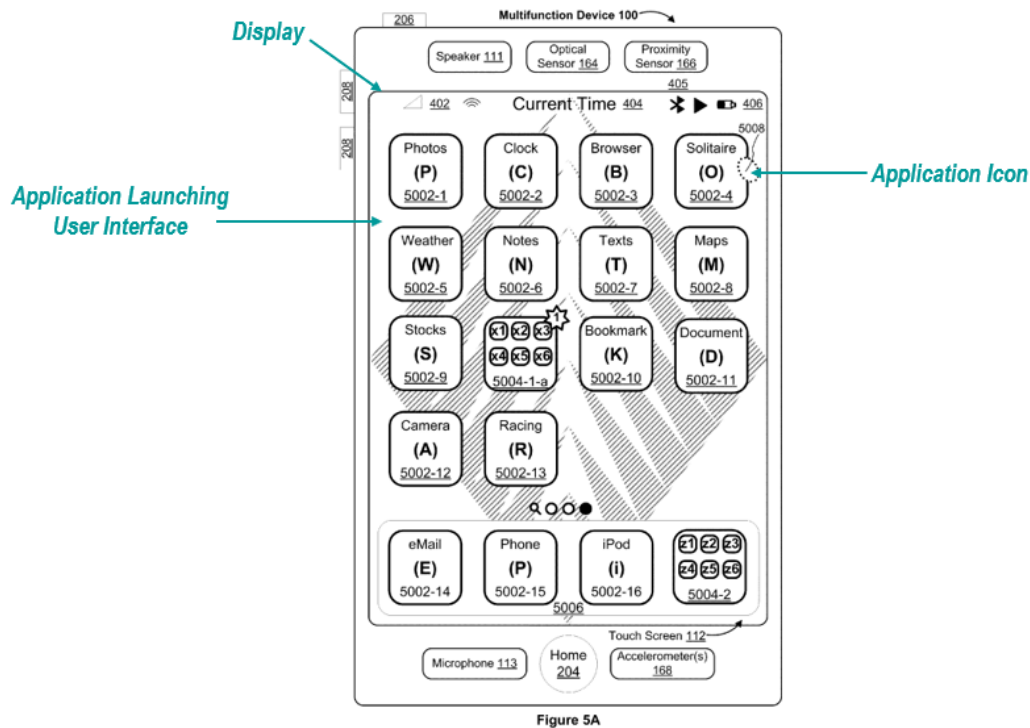
- (iii) ***Elements [1.c] one or more processors; [1.d] memory; and [1.e] one or more programs, wherein the one or more programs are stored in the memory and configured to be executed by the one or more processors, the one or more programs including instructions for:***

81. The Chaudhri-Martyn-Griffin combination renders obvious Elements [1.c], [1.d], [1.e], and Claim 1 as a whole. For example, Chaudhri discloses “a multi-function device [that] includes a display, ***one or more processors, memory, and one or more programs.***” EX1004 (Chaudhri), [0015], *see also* [0080]-[0081], [0177], Figures 1A, 1B, 3. “***The one or more programs are stored in the memory and configured to be executed by the one or more processors.***” EX1004 (Chaudhri), [0015], *see also* [0017], [0081] (“The one or more processors 120 run or execute various software programs and/or sets of instructions stored in memory 102 to perform various functions for device 100[.]”), [0098] (identifying programs, instructions, modules stored in memory), [0127], [0146] (explaining that the identified programs, instructions, and modules perform the functions throughout the disclosure), [0177], Figures 1A, 1B, 3.

- (iv) ***Element [1.f] displaying, on the display, an application launching user interface that includes a plurality of application icons for launching corresponding applications;***

82. The Chaudhri-Martyn-Griffin combination renders obvious Element [1.f] and Claim 1 as a whole. To start, Chaudhri describes and illustrates numerous ***user interface*** pages ***displayed*** on the touch screen ***display*** of a mobile electronic

device. EX1004 (Chaudhri), [0029], [0179-0180], [0216], Figures 4A-5PPP. Chaudhri further discloses that these user interface pages present “a menu of applications”—i.e., “a plurality of selectable user interface objects, including **a plurality of [application] icons** 5002...for activating [(**launching**)] respective **applications**.” EX1004 (Chaudhri), [0180], [0216], Figure 5A, *see also* [0029], [0179], [0217] (“selecting one of the action icons will activate an application (e.g., **launch an application** that is not currently running on the device...)”), [0280] (illustrating an example where “selecting a solitaire **application icon** 5002-1 in Figure 5A (e.g., while the device is in a normal operation mode) would **launch** a solitaire game **application**.”), Figures 4A, 5B.



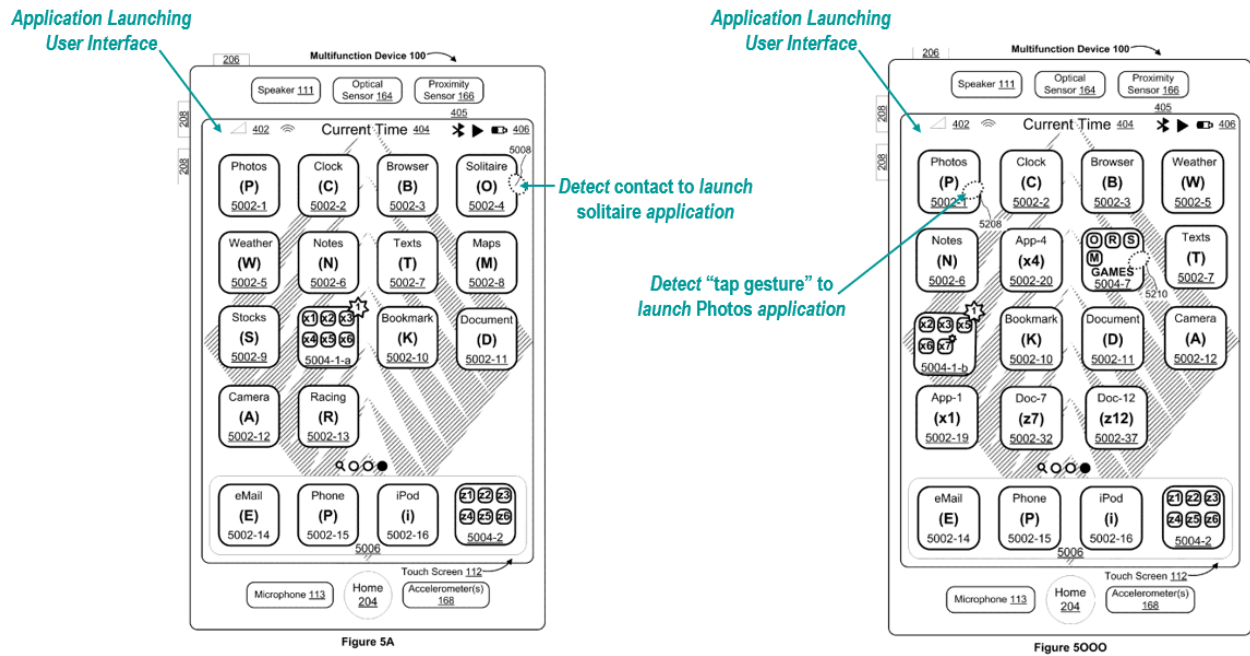
EX1004 (Chaudhri), Figure 5A (annotated)

- (v) *Element [1.g] while displaying the application launching user interface, detecting a first single-finger touch input that includes detecting the first single-finger touch input at a location on the touch-sensitive surface that corresponds to a first application icon of the plurality of application icons, wherein the first application icon is for launching a first application that is associated with one or more corresponding action options; and*

83. The Chaudhri-Martyn-Griffin combination renders obvious Element [1.g] and Claim 1 as a whole.

84. As I explained above at Element [1.f], Chaudhri discloses *displaying an application launching user interface* including one or more pages presenting *a plurality of icons* corresponding to respective *applications*.

85. Additionally, as illustrated in Figure 5A's depiction of a *displayed application launching user interface*, Chaudhri explains that "the device *detects* a contact 5008 with the solitaire application icon" and performs a responsive action (e.g., *launching the application* or entering the reconfiguration mode) based on the characteristics of the touch. EX1004 (Chaudhri), [0216-0217]; *see also above* Section VIII.A. Chaudhri provides a similar teaching in connection with Figure 5000, where "*detecting* a tap gesture 5208 at a location on the touch-sensitive surface that corresponds to the photos action icon 5002-1" causes the device to "*launch[] the photos application.*" EX1004 (Chaudhri), [0276].



EX1004 (Chaudhri), Figures 5A (annotated), 5000 (annotated)

86. Consistent with Chaudhri's disclosure as a whole, the **detected** contact is depicted in Figure 5A and Figure 5000 as a **single-finger touch input at a location of the touch screen (touch-sensitive surface) that corresponds to the solitaire (first) application icon**. EX1004 (Chaudhri), [0102] (“[D]etecting a finger tap **gesture**...at the position of an **icon**...”), [0101] (describing operations being “applied to **single** contacts (e.g., one **finger** contacts)”), [0216-0217], [0276], [0280], [0302], [0310-0311], Figures 5A, 5000, 7A, 7C; *see also below*, Elements [1.h]-[1.l] (discussing various touch inputs detected as having different durations).

87. Chaudhri discloses that each of the applications (including **the first application**) for which there is a corresponding application icon (including **the first application icon**) is **associated with** “one or more functions” (**action options**).

EX1004 (Chaudhri), [0146] (describing “each of the ... **applications** correspond to a set of executable instructions for performing one or more functions”), [0280]. Additionally, as discussed in Section VIII.D, the Chaudhri-Martyn-Griffin combination incorporates Martyn’s disclosure regarding an application-specific contextual “summary window” that includes “links to common functionality in [(**action options associated with**)] that **application.**” EX1005 (Martyn), [0017], *see also* [0015-0019], Figures 2-3; *below*, Element [1.j].

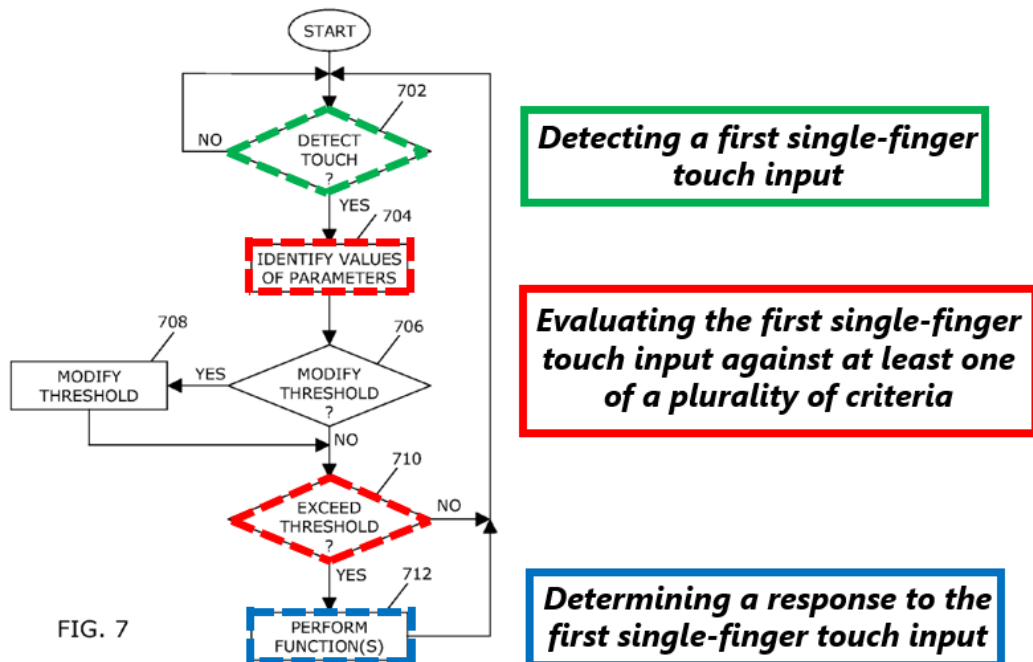
- (vi) ***Element [1.h] in response to detecting the first single-finger touch input, determining a response to the first single-finger touch input based on evaluating the first single-finger touch input against at least one of a plurality of criteria, including evaluating a duration of the first single-finger touch input against at least one of: one or more application-launch criteria, one or more action-option-display criteria, or one or more operation criteria, and further including evaluating a movement of the first single-finger touch input against one or more movement criteria, for:***

88. The Chaudhri-Martyn-Griffin combination renders obvious Element [1.h] and Claim 1 as a whole.

89. As I explained above at Element[1.g], Chaudhri provides the feature of ***detecting the first single-finger touch input*** and ***determining a responsive*** action based on the characteristics of the touch.

90. Moreover, as I explained at Section VIII.D, the Chaudhri-Martyn-Griffin combination incorporates Griffin’s teachings about ***determining a response to the first single-finger touch input based on evaluating the first single-finger***

touch input against at least one of a plurality of criteria. For example, Griffin describes a cyclical process flow where specific “values of one or more various parameters are identified.” EX1006 (Griffin), [0040], Figure 7 (elements 702, 704). These “parameters may include...touch parameters” like “touch duration.” EX1006 (Griffin), [0040], Figure 7 (elements 702, 704); *see also* [0032], [0037], [0042-0043], [0050]. Later in Griffin’s process flow, the touch duration value is evaluated against multiple touch duration *criteria* to *determine a responsive* “function.” *See* EX1006 (Griffin), [0053], [0032], Figure 7 (element 710, 712). After performing the function triggered by satisfying the given *criteria*, the cyclical process flow continues to monitor the touch duration value. EX1006 (Griffin), Figure 7 (elements 710, 712→ 702, 704).



EX1006 (Griffin), Figure 7 (annotated)

91. Turning back to Chaudhri, this aspect of the Chaudhri-Martyn-Griffin combination provides that the **plurality of criteria** against which the **touch input** is **evaluated** includes an **application-launch criteria, an operation criteria, and a movement criteria**. For example, Chaudhri distinguishes between a short-**duration** “tap gesture” for launching an application (**application-launch criteria**, per Element [1.i]) and a longer-**duration** touch-and-hold contact (e.g., 2 seconds) for initiating a reconfiguration mode (**operation criteria**, per Element [1.k]). EX1004 (Chaudhri), [0217], [0289]; *see also* [0101]-[0102], [0276], Figures 5A, 5000. Chaudhri further discloses that, while in the reconfiguration mode, detection of a **movement** contact results in the corresponding movement of an application icon (e.g., **detecting a drag, satisfying movement criteria**, per Element [1.l]). EX1004 (Chaudhri), [0087], [0101], [0220], Figures 5B-5C.

92. Finally, as I explained above at section VIII.D, the Chaudhri-Martyn-Griffin combination further includes Martyn’s “summary window” providing “a limited list of...common functions [(**particular actions**)] offered within an application.” EX1005 (Martyn), [0009-0011], [0017], Figures 1-3. As integrated with Chaudhri and Griffin, Martyn’s “summary window” is invoked by a touch-and-hold contact on an application icon that meets a predetermined **duration** threshold (the **action-option-display criteria** recited in Element [1.j]).

- (vii) ***Element [1.i] in accordance with a determination that the first single-finger touch input meets the one or more application-launch criteria that is met when the duration of the first single-finger touch input is evaluated to be less than a first time threshold, launching the first application,***

93. The Chaudhri-Martyn-Griffin combination renders obvious Element [1.i] and Claim 1 as a whole. For example, as discussed at Element [1.g], Chaudhri describes the concept of “detecting” that a ***first single-finger touch input*** is “a tap gesture” on an application icon and, ***in accordance with*** that detection, “***launching*** [that] ***application.***” EX1004 (Chaudhri), [0276], *see also* [0102], [0216-0217], [0302], [0310], Figures 5A, 5000, 7A, 7C. As I explained above at Section VIII.D(iii), it would have been evident to a POSITA that Chaudhri’s “tap gesture” teaches a touch input having a ***duration*** within (e.g., ***less than***) a predetermined short ***(first) time threshold***. Accordingly, the combination of Chaudhri’s teaching to detect a short-***duration*** tap gesture with Griffin’s teaching to ***evaluate*** the parameters of a touch input against predetermined ***criteria*** renders obvious the concept of ***determining that the first single-finger touch input meets the one or more application-launch criteria that is met when the duration of the first single-finger touch input is evaluated to be less than a first time threshold.*** Above, Section VIII.D (motivation-to-combine), Element [1.h].

94. Building on my prior discussion from Section VIII.D(iii), it was well known long before the ’758 patent to detect a tap gesture by determining that a touch

duration is less than a threshold. See above Section VI.B.3; EX1035, 11:19-24 (describing a “gesture recognition unit” that distinguishes “between a tap and a touch” based on the duration of the contact, for example “the gesture recognition unit may detect any non-moving contact with a duration of less than 500 milliseconds as a tap, rather than a touch”); EX1033, 5:57-59 (defining a “tap” as “the placement of the tip of the stylus 38 on the screen 42 and its subsequent removal within a pre-determined period of time.”); EX1046 (Saponas), [0027] (describing that “[v]arious types of touches may occur, including a tap (which is defined as a single touch lasting less than or equal to a predetermined time)”). Moreover, a POSITA would have appreciated that this duration-less-than-a-threshold approach is particularly well suited in the context of Chaudhri and the Chaudhri-Martyn-Griffin combination, which include other duration-based touch gestures from which the tap gesture must be distinguished. Given that Chaudhri’s tap is the gesture with the shortest duration, it would have been apparent to a POSITA exercising common sense and ordinary creativity to detect and distinguish that gesture using the well-known approach of determining that the duration of the user’s touch is less than a predetermined threshold.

(viii) *Element [1.j] in accordance with a determination that the first single-finger touch input meets the one or more action-option-display criteria that is met when the duration of the first single-finger touch input is evaluated to be greater than the first time threshold, displaying one or more action option objects associated with the first application without launching the first application,*

95. The Chaudhri-Martyn-Griffin combination renders obvious Element [1.j] and Claim 1 as a whole. As discussed at Section VIII.D, this combination incorporates Martyn’s teachings regarding a contextual sub-menu called the “App Snapshot,” which comprises a “summary window” providing “a limited list of...common functions ([*action option objects*]) offered within [*the first application*].” EX1005 (Martyn), [0009]-[0011], [0017], Figures 1-3; *above*, Section VIII.C (motivation-to-combine), Element [1.h]. According to Martyn, “[t]he App Snapshot can [] display data from an application and functions of that application *without* actually opening [*(launching)*] *the application*.” EX1005 (Martyn), [0018], *see also* [0010]-[0011], [0053], Figures 1-3.

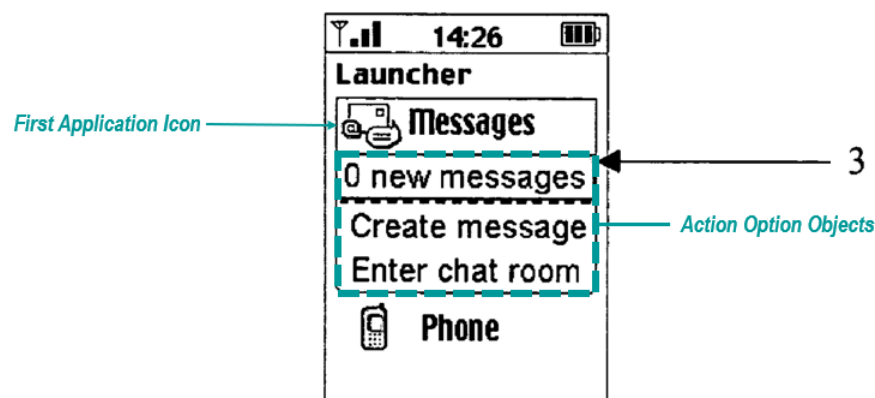


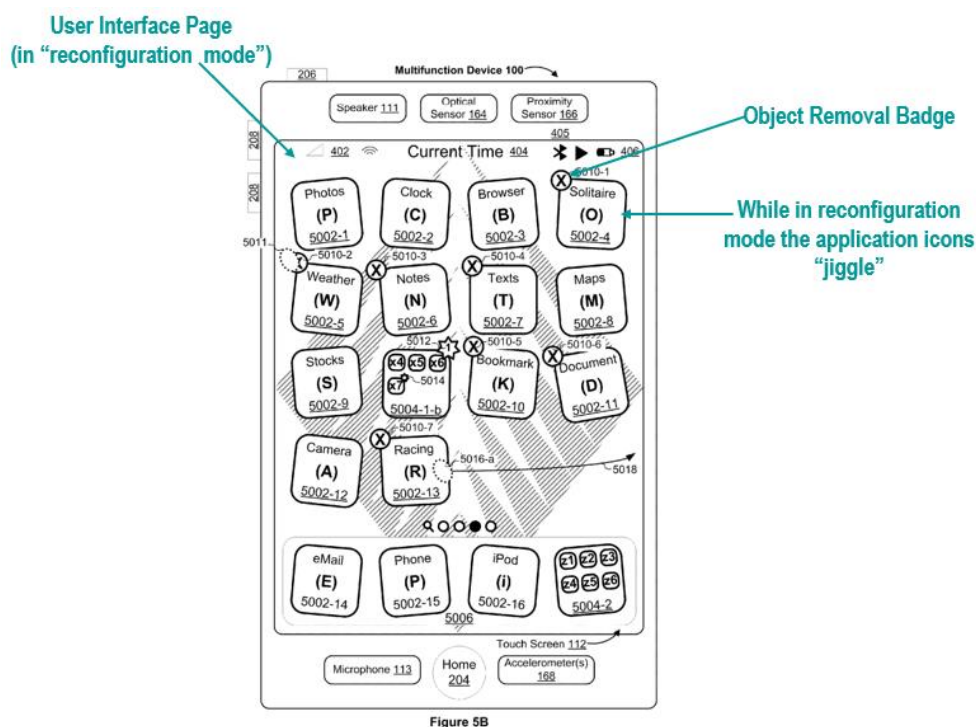
Figure 2

EX1005 (Martyn), Figure 2 (annotated)

96. As I discussed in Sections VIII.D, a POSITA would have integrated Martyn's teachings with Chaudhri and Griffin such that the App Snapshot summary window is displayed *in accordance with a determination that* the user's *single-finger touch input meets* a corresponding *action-option-display criterion* where the *duration* is *evaluated to be greater than the first time threshold*. See above, Sections VIII.D(i)-(ii) (discussing motivation-to-combine), Section VIII.D(iii) (explaining why a POSITA would have set the evaluation criterion for Martyn's App Snapshot to be *greater than a first time threshold*), Element [1.g] (discussing Chaudhri's teaching to detect a *single-finger touch input*), Element [1.h] (discussing Griffin's teaching to *evaluate* the user's touch against predetermined *criteria*). In other words, the Chaudhri-Martyn-Griffin combination features two operations for interfacing with an application when the device is operating in a "normal" mode, each invoked by a distinct gesture. See above, Sections VIII.D(i)-(ii). A tap gesture at an application icon launches the application, and a touch-and-hold gesture at the application icon triggers the App Snapshot. The *first time threshold* distinguishes the shorter tap gesture (*duration less than*) from the longer touch-and-hold gesture (*duration greater than*).

- (ix) ***Element [1.k] in accordance with a determination that the first single-finger touch input meets the one or more operation criteria that is met when the duration of the first single-finger touch input is evaluated to be greater than a second time threshold that is greater than the first time threshold, performing an operation in connection with the first application icon, and***

97. The Chaudhri-Martyn-Griffin combination renders obvious Element [1.k] and Claim 1 as a whole. For example, Chaudhri discloses that the device “enter[s] a user interface reconfiguration mode” (***performing an operation***) in response to detecting a touch at an “application icon...for more than a predetermined period of time (e.g., 2 seconds).” EX1004 (Chaudhri), [0217], Figure 5B. Further, I understand that dependent claim 26 of the ’758 Patent supports this mapping via the narrowing limitation of ***wherein...the operation includes entering an icon reconfiguration mode***. Upon entering the reconfiguration mode (***operation***), all of the application icons on the application menu (including the ***first application icon***) “jiggle as though they are floating on water,” and some of the application icons “are associated with an object removal badge.” EX1004 (Chaudhri), [0218], Figure 5B, *see also* [0180], [0313].



EX1004 (Chaudhri), Figure 5B (annotated)

98. As I discussed above in Section VIII.D, a POSITA would have understood that Chaudhri’s disclosure of detecting a touch lasting “more than a predetermined period of time (e.g., 2 seconds)” teaches or renders obvious making *a determination that the user’s single-finger touch input meets an operation criterion* where the *duration* is *evaluated to be greater than the second time threshold*. See above, Sections VIII.D(i)-(ii) (discussing motivation-to-combine), Section VIII.D(iii) (explaining why a POSITA would have set the evaluation criterion for Chaudhri’s reconfiguration mode to be *greater than a second time threshold*), Element [1.g] (discussing Chaudhri’s teaching to detect a *single-finger touch input*), Element [1.h] (discussing Griffin’s teaching to *evaluate* the user’s

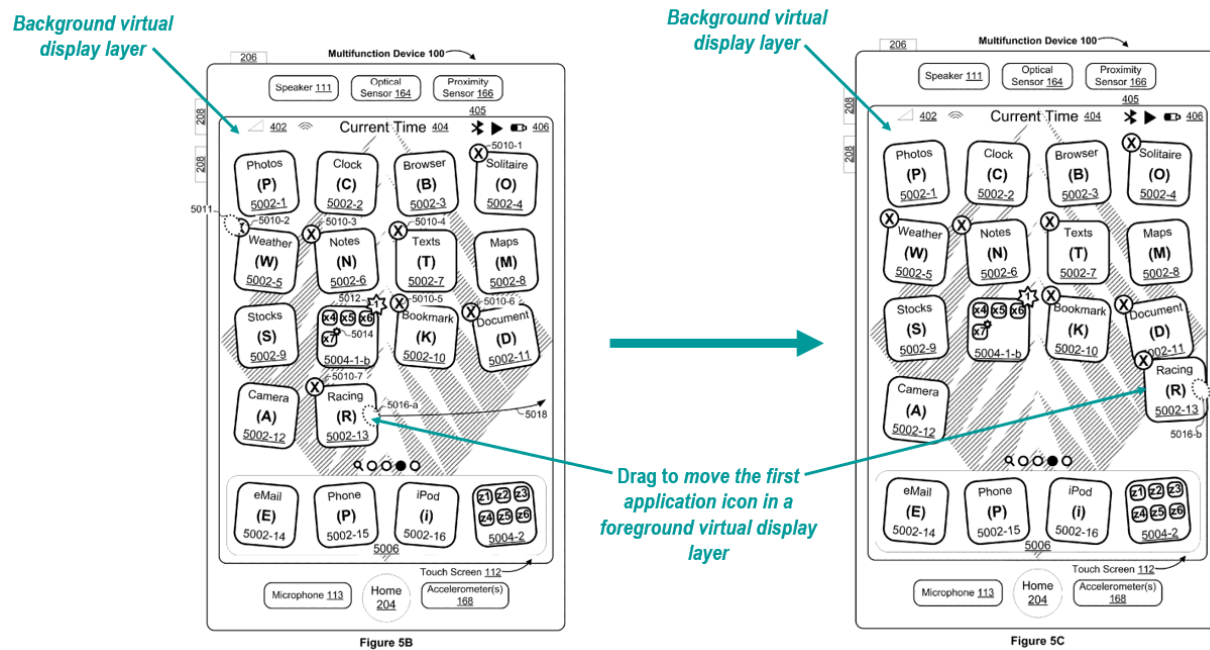
touch against predetermined *criteria*). The POSITA would have further understood that the *second time threshold* is distinct from and *greater than* the *first time threshold*. As I discussed above at section VIII.D(iii), a “tap” connotes a touch gesture that persists for a relatively short *duration* of time compared to the *duration* of a touch-and-hold that lasts for a significantly longer period of time—e.g., at least “2 seconds.”

99. I note further that a POSITA would have understood that, upon on reaching the second time threshold, the App Snapshot would be removed from the display in order to allow a user to interact with the application icons in “reconfiguration mode.” As the POSITA would have recognized, one primary purpose of the “reconfiguration mode” is to rearrange application icons (EX1004 (Chaudhri), [0015]). Thus, the “App Snapshot” logically would be removed from the display to prevent the App Snapshot from obstructing the view of locations on the display where application icons could be rearranged or otherwise interacted with by a user.

- (x) *Element [1.1] in accordance with a determination that the first single-finger touch input meets the one or more movement criteria, moving the first application icon in a foreground virtual display layer so that the first application icon appears to float above a background virtual display layer.*

100. The Chaudhri-Martyn-Griffin combination renders obvious Element [1.1] and Claim 1 as a whole. To start, Chaudhri discloses “*determining* if there is

movement of the contact [(**single-finger touch input**)] and tracking the **movement** across the touch-sensitive surface (e.g., detecting one or more finger-dragging events).” EX1004 (Chaudhri), [0101-102], *see also* [0087]; [0218], [0220], [0328-0331], Figures 5B-C, 9A-9B, 5KK-5MM. For example, as illustrated in Figures 5B and 5C (shown below), when the device is operating in the “reconfiguration mode” and detects a touch “at a location that corresponds to a ‘racing’ [application] icon” coupled with “subsequent movement” of the touch “to the edge of the touch-sensitive surface,” the **application icon** is likewise “**moved** to the edge of the display.” EX1004 (Chaudhri), [0220].



EX1004 (Chaudhri), Figures 5B-C (annotated)

101. Chaudhri's teaching to move an application icon in conjunction with a detected drag gesture combined with Griffin's teaching to evaluate a touch input against predetermined criteria renders obvious the claimed feature of **determining that the first single-finger touch input meets the one or more movement criteria and moving the first application icon**. For example, as discussed in Sections VIII.A, VIII.C, and VIII.D, Chaudhri teaches detecting a drag gesture which is a type of movement and Griffin teaches the concept of comparing the touch against different criteria. Accordingly, the combination includes comparing the user's **touch input** to **movement criteria** to detect the drag movement and, responsively, perform the corresponding function of **moving the first application icon**, as was well known in the art by 2011. *See above* Section VIII.D; EX1023, 78:14-21, 79:27-38, 106:64-107:7 (describing the detection of "finger-dragging events" on a touch screen); EX1048, [0032]-[0033] (describing detecting a touch and movement of the touch to reposition an icon on a GUI in a touch-sensitive display), *see also* [0038]; EX1045, p. 25 ("Arrange the icons by dragging them.").

102. Chaudhri further teaches and/or suggests that the first application is moved in **a foreground virtual display layer so that the first application icon appears to float above a background virtual display layer**. First, Chaudhri shows and describes that icons on the application menu user interface are displayed and **move** in front of a "wallpaper **background**." EX1004 (Chaudhri), [0368], Figures

5A-5D. Second, Chaudhri explains that, in the reconfiguration mode, the application icons “jiggle” as though they are *floating* on water.” EX1004 (Chaudhri), [0218], Figures 5B-E. Third, Chaudhri consistently shows the *application icon* being moved, with a drag touch, as being displayed *floating* on a *foreground virtual display layer above* the *virtual display layer* of the *background* wallpaper. EX1004 (Chaudhri), Figures 5B-5E, 5M-5N, 5JJ-5MM. For example, a POSITA would have understood that the movement of the icon over a static wallpaper demonstrates that the icon and wallpaper are in distinct virtual layers of the GUI. *See also* EX1001 (’758 patent), 72:34-48 (the ’758 patent confirming the mapping to Chaudhri by describing a background “display layer” that is “virtual” and “used to display a wallpaper”). This arrangement is evident in Chaudhri, for example, because the application icons occlude portions of the wallpaper. *See e.g.*, FIGs. 5A-5E.

103. Alternatively, the claimed *foreground virtual display layer* and *background virtual display layer* would have been exceedingly obvious to a POSITA. Given that the overwhelming majority of displays for computing devices in 2011 were flat two-dimensional structures, the use of multiple *virtual layers* to create a three-dimensional depth effect in a 2D-GUI environment was common practice. *See e.g.*, EX1021, p.4 (explaining the difference between “tiled windows, which are laid out side by side” and “overlapping windows, which can be stacked on top of each other, or overlaid, obscuring all or part of the lower *layers*”); EX1042,

13-14.⁴ Accordingly, it would have been obvious to a POSITA to use **virtual layers** to make the application icons appear overlaid on a wall paper background. See e.g., EX1049 8:56-61(describing components (e.g., widgets or icons) displayed in a “transparent layer that allows desktop 400 to be seen through it.”), see also FIG. 5.

104. Chaudhri also shows the **application icon** as being moved in a layer above another layer of the other application icons. EX1004 (Chaudhri), Figures 5B-5E, 5M-5N, 5JJ-5MM, [0282-0283] (describing the moving application icon as “overlapping” a non-moving application icon), [0348] (describing moving application icons behind a first application (e.g., the application icon being moved) when an automatic reconfiguration criteria is met to avoid overlap between the first application icon and the other application icons). In view of these disclosures, Chaudhri clearly teaches or renders obvious ***moving the first application icon in a foreground virtual display layer so that the first application icon appears to float above a background virtual display layer.***

105. I note that the '758 patent's claims do not include express language stating that the touch gestures embraced by Elements [1.i]-[1.l] must occur as part of a single continuous touch. Instead, the claims recite “evaluating the first single-

⁴ I note that this document bears a copyright date of 2013. I also note that the majority of cited references within this document are from the 2006 to 2012 timeframe. The quoted excerpt I rely on above is consistent with my knowledge and personal experience regarding the state of the art as of 2011.

finger touch input against at least one of a plurality of criteria,” (Element [1.h]), and performing particular functions “in accordance with” corresponding “determination[s]” about that touch input, (Elements [1.i]-[1.l]).

106. Still, even if the ’758 patent’s claims were interpreted to require a single continuous touch between Elements [1.k] and Elements [1.l], Claim 1 would be obvious. Indeed, based on my review, such an arrangement would have been apparent and obvious to a POSITA in view of Chaudhri’s teachings.

107. For example, a POSITA would have recognized that there are only three apparent design options to implement Chaudhri’s teachings for using a drag gesture to move an application icon after shifting from the “normal mode” to the “reconfiguration mode” via a touch-and-hold gesture. First, the device and interface could be designed so that the user must keep their finger down on the touch screen between the touch-and-hold gesture and the drag gesture. A POSITA would have appreciated that this option would allow the user to efficiently activate the “reconfiguration mode” at a particular target application icon and drag that target icon to a new location using a single gesture, without need to release the finger and start a second gesture at the same target icon. Second, the device and interface could be designed so that the user must break contact with the touch screen between the two gestures—i.e., inputting a touch-and-hold gesture followed by a distinct touch-and-drag gesture. Third, the device and interface could be designed so that the user

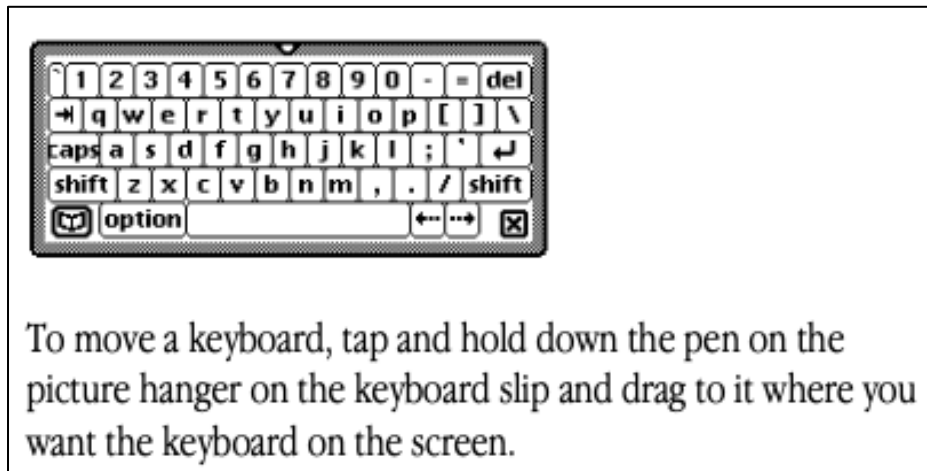
may input the two gestures either as a single continuous touch or as consecutive touches with a lift off in between.

108. All three of these design options—the first and third of which account for a single continuous touch—would have been apparent and predictable alternatives that a POSITA would have expected to yield virtually the same results (i.e., the ability to transition to a reconfiguration mode and move an application icon). This reason alone compels a finding of obviousness. Additionally, a POSITA applying common sense and ordinary creativity to the problem at hand would have appreciated that the most natural way to implement Chaudhri’s teachings would be to accommodate the third of the above-discussed design options, making the device and interface easier to use by providing multiple avenues for the user to move the application icon once activating the “reconfiguration mode.” In particular, a POSITA would have understood that the third option provides the greatest flexibility to the user, including the possibility for the user to change their mind about which icon to drag to a new location after activating the “reconfiguration mode.”

109. Further still, Chaudhri directly discloses the “exemplary components for event handling” that would enable activation of the “reconfiguration mode” and the dragging of an application icon in response to a single continuous gesture. EX1004 (Chaudhri), [0054], Figure 1C. Specifically, Chaudhri discloses that “[e]vent monitor 171 receives event information from peripherals interface 118.

Event information includes information about a sub-event (e.g., a user touch on a touch-sensitive display 112, as part of a multi-touch gesture). EX1004 (Chaudhri), [0152]. Once the target user interface element of a gesture is determined (by “[h]it view determination module 172”), “the hit view typically receives all sub-events related to the same touch.” EX1004 (Chaudhri), [0157]. Chaudhri goes on to disclose that “sub-events in an event 187 include, for example, touch begin, touch end, touch movement, touch cancellation, and multiple touching”, and that “dragging, for example, comprises a touch (or contact) on the displayed object for a predetermined phase, a movement of the touch across touch-sensitive display 112, and a lift off of the touch (touch end).” EX1004 (Chaudhri), [0164].

110. Chaudhri’s disclosure of multiple events being generated in response to a single continuous gesture is consistent with the POSITA’s understanding of the same, established at least a decade prior to the filing of the ’758 patent. For example, the Apple Newton MessagePad (released in 1993) included a gesture-based user interface in which objects (such as the on-screen keyboard) could be first selected with a tap and hold gesture (producing a “squeak” sound) and then moved over the display with a drag that was a continuation of the tap and hold gesture.



EX1047 (Newton Apple MessagePad Handbook), page 55 (pdf page 36)

111. Thus, Chaudhri renders obvious a single continuous touch between the gestures of Element [1.k] and Element [1.l].

2. Claim 9

- (i) *Element [9] The electronic device of claim 1, wherein the one or more programs include instructions for, in response to determining that the one or more action-option-display criteria has been met, generating a first tactile output that is indicative of a satisfaction of the one or more action-option-display criteria.*

112. The Chaudhri-Martyn-Griffin combination renders obvious Element [9] and Claim 9 as a whole. For example, Griffin teaches the concept of providing “**tactile** feedback” **in response to** determining that the user’s contact on the touch screen has **satisfied** a given evaluation **criteria**. EX1006 (Griffin), [0034]; *see also* [0014], [0024], [0030], [0032], [0035], [0053], [0057], Figure 1. A POSITA would have been motivated to apply this teaching by Griffin to the various evaluation criteria in the Chaudhri-Martyn-Griffin combination, including **the action-option-**

display criteria discussed above in Elements [1.h] and [1.j]. First, Chaudhri’s disclosure suggests and invites this aspect of the combination, incorporating by reference at Paragraph [0090] a teaching from U.S. patent application Ser. No. 11/367,749 about a “haptics mechanism...configured to vibrate” in response to certain “touch events” for the purpose of “alert[ing] a user that a user input has been made.” EX1041, p. 42 ([0161]); *see also generally id.*, pp. 42-43 ([0160-0163]). Second, tactile feedback was a well-known solution to the longstanding problem in mobile device computing of confirming user inputs, providing alerts, and giving contextual cues to users. *E.g.*, EX1026, Abstract; EX1027, pp.1-2; EX1028, pp.1-2; EX1029, p.4; EX1030, pp.1, 11. The POSITA would have recognized that Griffin’s “tactile feedback” teaching would serve this same purpose in the Chaudhri-Martyn-Griffin combination—e.g., confirming the user’s touch-and-hold gesture (***indicative of satisfaction***) and prompting the user to interact with Martyn’s forthcoming contextual sub-menu.

3. Claim 12

- (i) ***Element [12] The electronic device of claim 1, wherein displaying the one or more action option objects includes displaying the one or more action option objects in a menu that includes a plurality of action option objects.***

113. The Chaudhri-Martyn-Griffin combination renders obvious Element [12] and Claim 12 as a whole. As discussed, this combination includes Martyn’s

teaching of a contextual sub-**menu** called an “App Snapshot” that features a “summary window” displaying a plurality of “common functions” of an application (**action option objects**). Above, Element [1.j], Section VIII.B; see also EX1005 (Martyn), [0009]-[0011], [0017]-[0018], Figures 1-3.

4. Claim 19

- (i) *Element [19] The electronic device of claim 1, wherein: the first application is a content creation application; the one or more action option objects include a respective action option object that is associated with creating a new object; and wherein the one or more programs include instructions for: detecting selection of the respective action option object, and, in response to detecting selection of the respective action option object, creating the new object.*

114. The Chaudhri-Martyn-Griffin combination renders obvious Element [19] and Claim 19 as a whole. As discussed, this combination incorporates Martyn’s teachings regarding a contextual sub-menu called an “App Snapshot” that features a “summary window” displaying a plurality of “common functions [(**action option objects**)] offered within [**the first**] application.” EX1005, [0009]-[0011], [0017], Figures 1-3; above, Section VIII.C (motivation-to-combine), Elements [1.h] and [1.j]. Martyn further teaches that **the first application** can be a “Messages application” (**content creation application**). EX1005 (Martyn), [0017], Figure 3. Chaudhri teaches the same—i.e., **the first application** can be an “instant messaging” application or an “E-mail client” (**content creation applications**). EX1004

(Chaudhri), [0075], [0128], [0131-0132] (discussing an “e-mail client module” and an “instant messaging module”), [0187], [0191], Figure 4A (“Text”/“IM” application icon 141, “Mail” application icon 140). In the context of a “Messages application,” Martyn explains that one of the “common functions” (***action option objects***) includes a “***Create*** Messages” function. EX1005 (Martyn), [0017], Figure 3. “[W]hen ‘Create Messages’ in an App Snapshot is ***selected***, then the messaging application is opened up” to ***create the new*** message (***object***). EX1005 (Martyn), [0018].

5. Claim 20

- (i) ***Element [20] The electronic device of claim 19, wherein the content creation application includes an email application, and the new object includes a new email message.***

115. The Chaudhri-Martyn-Griffin combination renders obvious Element [20] and Claim 20 as a whole including for all the reasons discussed above at Element [19] (discussing Chaudhri’s disclosure of an “***E-mail*** client” application and corresponding icon); *see also* EX1005 (Martyn), [0030] (Martyn discussing the concept of generating “a new ***email***...”), Figure 3 (indicating the number of “unread ***emails***”).

6. Claim 21

- (i) *Element [21] The electronic device of claim 1, wherein: the first application is a content creation application; the one or more action option objects include a respective action option object that is associated with displaying at least a portion of previously created content; and wherein the one or more programs include instructions for: detecting selection of the respective action option object, and, in response to detecting selection of the respective action option object, displaying the at least portion of previously created content.*

116. The Chaudhri-Martyn-Griffin combination renders obvious Element [21] and Claim 21 as a whole including for all the reasons discussed above at Elements [19] and [20]. Martyn’s *action option object* for “unread emails” connotes *displaying content previously created* by other users. Moreover, Martyn’s App Snapshot includes an additional *selectable action option object* associated with the “Messages” *content creation application* for *displaying* a chat that is “ongoing.” EX1005 (Martyn), Figure 3, [0017-0018]. A POSITA would have understood that an “ongoing” chat includes *previously created* messages (*content*).

7. Claim 22

- (i) *Element [22] The electronic device of claim 21, wherein the content creation application includes an email application, and the displayed at least portion of previously created content includes a previous email message, for generating a reply thereto.*

117. The Chaudhri-Martyn-Griffin combination renders obvious Element [22] and Claim 22 as a whole including for all the reasons discussed above at Elements [19], [20], [21]. As discussed, Martyn’s App Snapshot includes a

selectable ***action option object*** associated with the “Messages” ***content creation application*** for interacting with “unread ***emails***” (***previous email messages***). EX1005 (Martyn), Figure 3, [0017-0018]. As a POSITA would have understood, the purpose of viewing “unread emails” is ***for generating a reply thereto***. See also EX1004 (Chaudhri), [0131] (explaining that a common functionality of an email client is to “create, send, receive, and manage e-mail”); EX1005 (Martyn), [0017] (Martyn teaching options in the App Snapshot include “common functionality”), [0030] (Martyn discussing functionality to create email messages).

8. Claim 24

- (i) ***The electronic device of claim 1, wherein the electronic device is configured such that the operation is related to a delete operation.***

118. The Chaudhri-Martyn-Griffin combination renders obvious Element [24] and Claim 24 as a whole. As discussed, Chaudhri discloses the notion of displaying “an object removal badge” for ***deleting*** application icons as part of entering the “reconfiguration mode” (***operation***). Above, Element [1.k]; EX1004 (Chaudhri), [2018], Figure 5B (reference number 50101).

9. Claim 25

- (i) ***Element [25] The electronic device of claim 1, wherein the electronic device is configured such that the operation includes displaying a graphical user interface element for, in response to detecting a selection thereof, deleting the first application icon.***

119. The Chaudhri-Martyn-Griffin combination renders obvious Element [25] and Claim 25 as a whole. As discussed, Chaudhri discloses the notion of ***displaying*** “an object removal badge” (***a graphical user interface element***) on each ***application icon*** as part of entering the “reconfiguration mode” (***operation***). Above, Element [1.k]; EX1004 (Chaudhri), [0218], Figure 5B (reference number 5010-1). “[W]hen the device ***detects*** activation [(***selection***)] ***of the object removal badge*** (e.g., tap gesture 5011 in Figure 5B), the selectable user interface object (e.g., weather ***application icon*** 5002-5 in Figure 5B) associated with the object removal badge is removed from the user interface (e.g., ***deleted***).” EX1004 (Chaudhri), [0218]; Figure 5B.

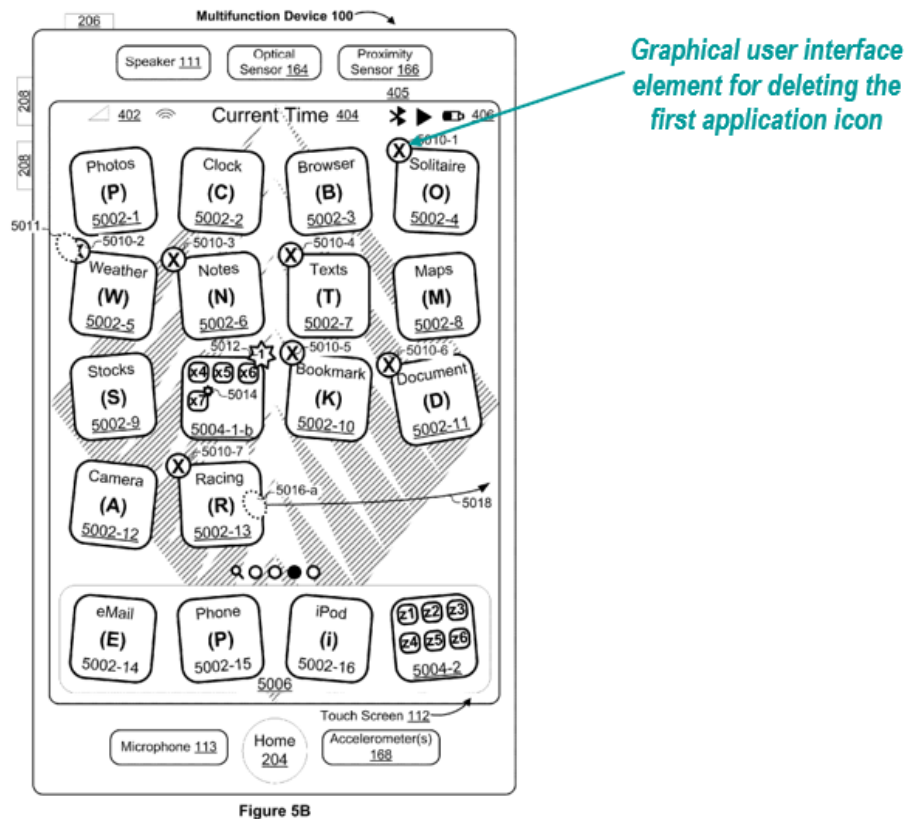


Figure 5B

EX1004 (Chaudhri), Figure 5B (annotated)

10. Claim 26

- (i) *Element [26] The electronic device of claim 1, wherein the electronic device is configured such that the operation includes entering an icon reconfiguration mode in which one or more of the plurality of application icons is capable of being reorganized on the application launching user interface.*

120. The Chaudhri-Martyn-Griffin combination renders obvious Element [26] and Claim 26 as a whole including for all the reasons discussed above regarding Chaudhri's “**reconfiguration** mode” (**operation**) and application menu (**application launching user interface**) at Elements [1.f], [1.k] and Section VIII.A; EX1004 (Chaudhri), [0015] (explaining that the “reconfiguration mode” is “for rearranging

the [application] icons...”), [0029], [0179-0180], [0216-0218], [0280], [0301] (explaining that the “reconfiguration mode” is where icons “can be moved around the display”), [0313], Figures 4A-5PPP, 7A-B.

11. Claim 27

- (i) *Element [27] The electronic device of claim 1, wherein the electronic device is configured such that the operation includes changing a mode of operation.*

121. The Chaudhri-Martyn-Griffin combination renders obvious Element [27] and Claim 27 as a whole including for all the reasons discussed above regarding Chaudhri’s “reconfiguration **mode**” (**operation**) at Element [1.k] and Section VIII.A (explaining that Chaudhri’s device is configured to operate in, and transitioning between, a “normal **mode**” and a “reconfiguration **mode**”).

12. Claim 28

- (i) *Element [28] The electronic device of claim 1, wherein the electronic device is configured such that the operation includes adding a graphical user interface element to the first application icon.*

122. The Chaudhri-Martyn-Griffin combination renders obvious Element [8] and Claim 28 as a whole including for all the reasons discussed above regarding Chaudhri’s teachings of a “reconfiguration mode” (**operation**) that **adds** an “object removal badge” (**graphical user interface element**) to the first **application icon** at Elements [1.k], [25] and Section VIII.A.

123. For example, as discussed, Chaudhri discloses the notion of displaying “an object removal badge” (*a graphical user interface element*) on some of the *application icons* as part of entering the “reconfiguration mode” (*operation*). Above, Element [1.k]; EX1004 (Chaudhri), [0218], Figure 5B (reference number 5010-1); see also [0180], [0313].

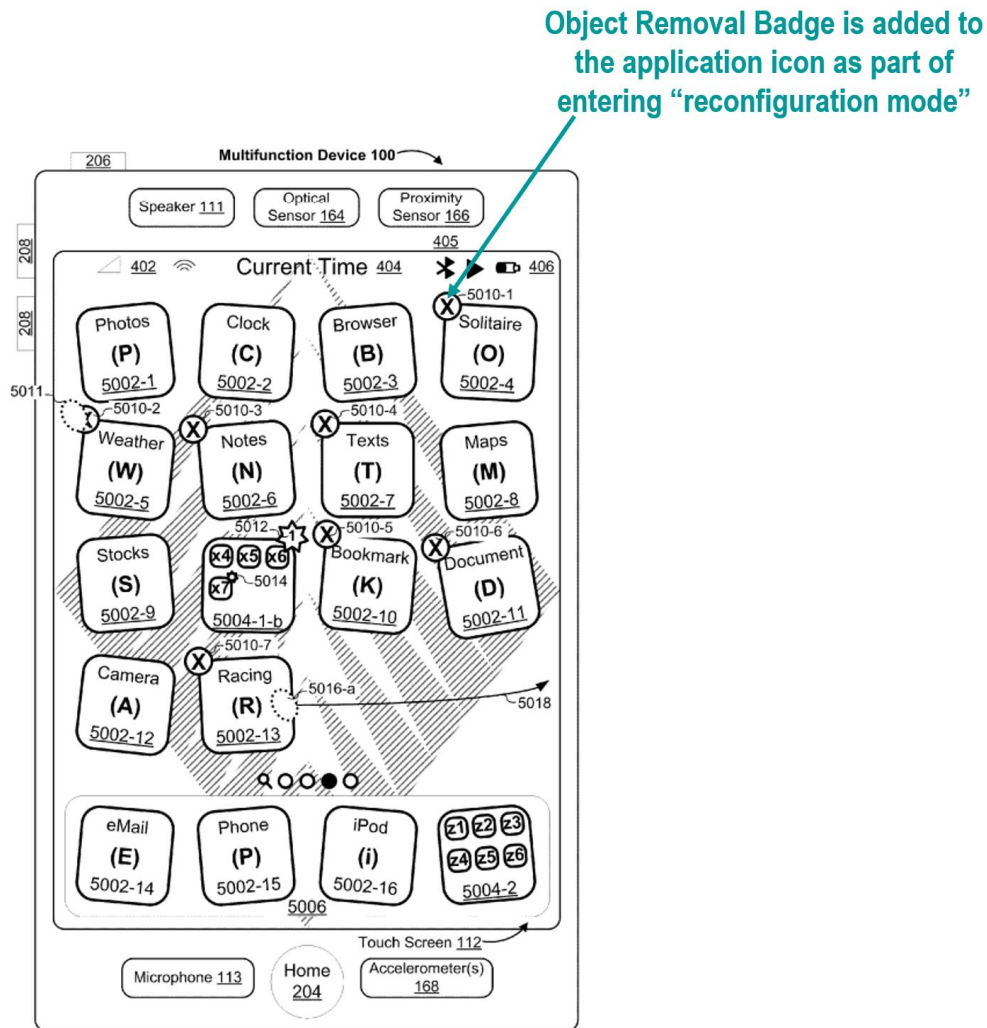


Figure 5B

EX1004 (Chaudhri), Figure 5B (annotated)

13. Claim 29

- (i) ***Element [29] The electronic device of claim 1, wherein the electronic device is configured such that the operation includes moving the first application icon.***

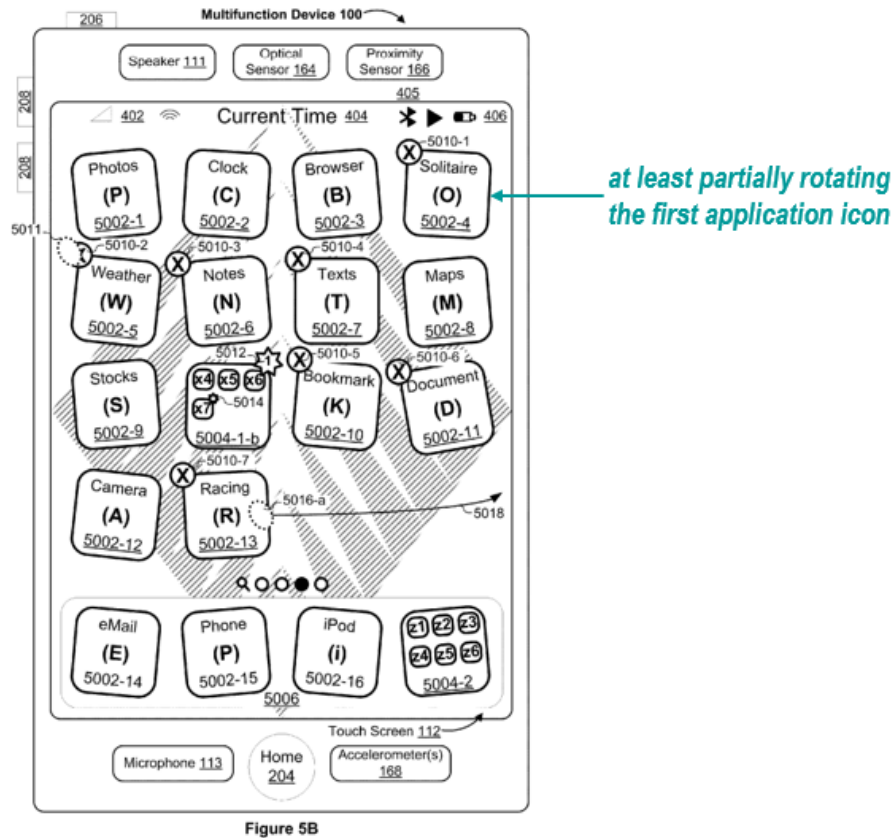
124. The Chaudhri-Martyn-Griffin combination renders obvious Element [29] and Claim 29 as a whole. As discussed at Element [1.k], Chaudhri discloses that the device “enter[s] a user interface reconfiguration mode” (***the operation***) in response to detecting a touch at an “application icon...for more than a predetermined period of time (e.g., 2 seconds).” EX1004 (Chaudhri), [0217], Figure 5B. As also discussed at Element [1.k], I understand that dependent claim 26 of the ’758 Patent supports this mapping via the narrowing limitation of ***wherein...the operation includes entering an icon reconfiguration mode.*** Upon entering the reconfiguration mode (***operation***), all of the application icons on the application menu (including the ***first application icon***) “jiggle as though they are floating on water.” EX1004 (Chaudhri), [0218], Figure 5B, *see also* [0180], [0313]. The jiggle is describes as oscillating the application icon about a respective average position. EX1004 (Chaudhri), [0218]. Oscillating an application icon about a respective average position is a clear example of moving the application icon. Accordingly, ***the operation*** (e.g., entering “reconfiguration mode”) includes ***moving*** (e.g., “jiggle”) ***the first application icon.*** See Figure 5B, [0180], [0217-0218], [0313].

125. As another independent basis to find obviousness, ***moving the first application icon*** is a consequence of entering the “reconfiguration mode” (***the operation***) and executing a drag gesture. See Element [1.l].

14. Claim 30

- (i) ***Element [30] The electronic device of claim 1, wherein the electronic device is configured such that the operation includes at least partially rotating the first application icon.***

126. The Chaudhri-Martyn-Griffin combination renders obvious Element [30] and Claim 30 as a whole including for all the reasons discussed above at Elements [1.k], [29] regarding Chaudhri’s teaching of a “reconfiguration mode” (***operation***) that causes all of the application icons, including ***the first application icon***, to “jiggle.” EX1004 (Chaudhri), [0218] (describing the “jiggle” movement as “oscillat[ing] about a respective average position”), Figure 5B, *see also* [0180], [0313]. As shown, for example, in Chaudhri’s Figure 5B, the oscillating “jiggle” movement includes ***at least partially rotating the application icons***. EX1004 (Chaudhri), Figure 5B, [0218].



EX1004 (Chaudhri), Figure 5B (annotated)

15. Claim 31

- (i) *Element [31] The electronic device of claim 1, wherein the electronic device is configured such that the operation includes animating the first application icon.*

127. The Chaudhri-Martyn-Griffin combination renders obvious Element [31] and Claim 31 as a whole for all the reasons discussed above at Elements [1.k], [29], [30] regarding Chaudhri's teaching of a "reconfiguration mode" (*operation*) that causes all of the application icons, including *the first application icon*, to perform a "jiggle" movement *animation*. EX1004 (Chaudhri), [0218], Figure 5B, *see also* [0180], [0313].

128. Specifically, as discussed at Element [1.k], Chaudhri discloses that the device “enter[s] a user interface reconfiguration mode” (***the operation***) in response to detecting a touch at an “application icon...for more than a predetermined period of time (e.g., 2 seconds).” EX1004 (Chaudhri), [0217], Figure 5B. As also discussed at Element [1.k], I understand that dependent claim 26 of the ’758 Patent supports this mapping via the narrowing limitation of ***wherein...the operation includes entering an icon reconfiguration mode***. Upon entering the reconfiguration mode (***operation***), all of the application icons on the application menu (including the ***first application icon***) “jiggle as though they are floating on water.” EX1004 (Chaudhri), [0218], Figure 5B, *see also* [0180], [0313]. The jiggle is describes as oscillating the application icon about a respective average position. EX1004 (Chaudhri), [0218]. Oscillating an application icon about a respective average position would have been understood to involve ***animating*** the first application icon to present the oscillating movement of the application icon to a user. Accordingly, ***the operation*** (e.g., entering “reconfiguration mode”) includes ***animating the first application icon*** to present the “jiggle” movement of the application icon. *See* Figure 5B, [0180], [0217-0218], [0313].

16. Claim 32

- (i) ***Element [32] The electronic device of claim 1, wherein the electronic device is configured such that the operation includes cyclically animating the first application icon.***

129. The Chaudhri-Martyn-Griffin combination renders obvious Element [32] and Claim 32 as a whole for all the reasons discussed above at Elements [1.k], [29], [30], [31] regarding Chaudhri's teaching of a "reconfiguration mode" (***operation***) that causes all of the application icons, including ***the first application icon***, to perform a "jiggle" ***animation*** comprising "oscillat[ing motion] about a respective average position." EX1004 (Chaudhri), [0218], Figure 5B, *see also* [0180], [0313]. A POSITA would have understood "oscillating" motion to connote a ***cyclical*** movement ***animation***.

17. Claim 35

- (i) ***Element [35] The electronic device of claim 1, wherein the electronic device is configured such that, in accordance with the determination that the first single-finger touch input meets the one or more movement criteria, multiple of the plurality of application icons is moved in the foreground virtual display layer so that the multiple of the plurality of application icons appear to float above the background virtual display layer.***

130. The Chaudhri-Martyn-Griffin combination renders obvious Element [35] and Claim 35 as a whole. As discussed at Element [1.l] and Section VIII.B, Chaudhri provides that entering the "reconfiguration mode" of the device triggers a "visual indication" where ***all of the application icons*** displayed on the application

menu *move in the foreground virtual display layer above the wallpaper in the background virtual display layer*—i.e., “jiggle as though they are *floating* on water.” EX1004 (Chaudhri), [0218], Figure 5B. As was also discussed at Elements [1.h], [1.l] and Sections VIII.A, VIII.D, Chaudhri’s teachings (as supplemented by Griffin) regarding the “reconfiguration mode” further provide the claim limitations of *determining that the first single-finger touch input meets the one or more movement criteria* and responsively *moving* the first application icon across the display *in a foreground virtual display layer above a background virtual display layer*. EX1004 (Chaudhri), [0220], Figures 5B-5C. As shown in Chaudhri’s Figures 5B and 5C, the remaining *plurality of application icons* continue to jiggle (*move*) as the first application icon moves across the display. Additionally/alternatively, the trivial notion of continuing the jiggling movement would have been exceedingly obvious to a POSITA exercising common sense and ordinary creativity. The continued jiggling would serve the purpose of confirming for the user that the device remains in the reconfiguration mode.

18. Claim 36

- (i) ***Element [36] The electronic device of claim 1, wherein the electronic device is configured such that the one or more action option objects associated with the first application is displayed along with the first application icon.***

131. The Chaudhri-Martyn-Griffin combination renders obvious Element [36] and Claim 36 as a whole. As discussed, this combination includes Martyn's teachings about ***displaying*** an "App Snapshot" listing selectable common functions (***the action option objects***) associated with ***the first application***. Above, Elements [1.g], [1.j]. Martyn also teaches that the "App Snapshot" is ***displayed along with the first application icon***. EX1005 (Martyn), Figures 2-3. For example, Figures 2-3 show the "App Snapshot" under the application icon for the "Messages application." EX1005 (Martyn), Figures 2-3.

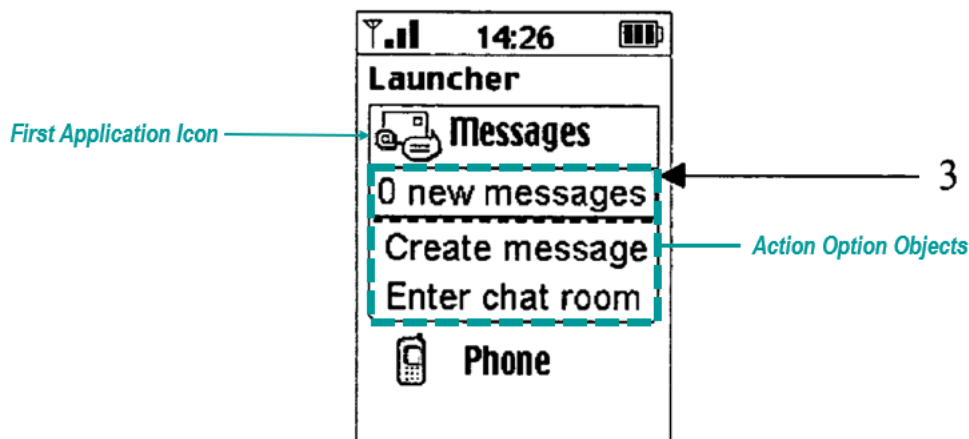


Figure 2

EX1005 (Martyn), Figure 2 (annotated)

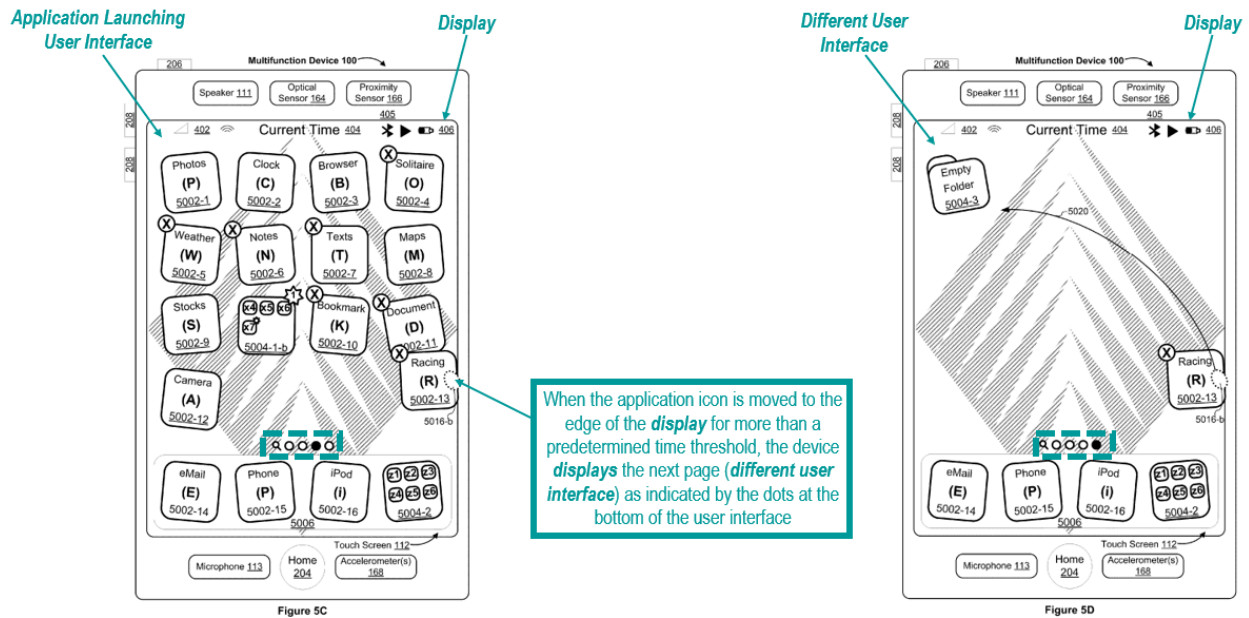
19. Claim 37

- (i) *Element [37] The electronic device of claim 1, wherein the electronic device is configured such that, in accordance with the determination that the first single-finger touch input meets the one or more movement criteria, at least a portion of a different user interface is displayed on at least a portion of the display that was previously occupied by at least multiple of the plurality of application icons in the application launching user interface.*

132. The Chaudhri-Martyn-Griffin combination renders obvious Element [37] and Claim 37 as a whole. As discussed at Elements [1.h], [1.l] and Sections VIII.A, VIII.D, Chaudhri's teachings (as supplemented by Griffin) regarding the "reconfiguration mode" provide the claim limitations of ***determining that the first single-finger touch input meets the one or more movement criteria*** and responsively ***moving*** the first application icon across the displayed application menu page (***application launching user interface***, per Element [1.f]). EX1004 (Chaudhri), [0220], Figures 5B-5C. Chaudhri also provides the additional limitations where ***at least a portion of a different user interface is displayed on at least a portion of the display that was previously occupied by at least multiple of the plurality of application icons in the application launching user interface***. For example, Chaudhri further teaches that, "[i]n response to detecting the [movement of application] icon 5002-13 [to] the edge of the display (e.g., touch screen 112) for more than the predetermined time threshold, the device navigates to [(***displays***)] a

next set/page of selectable user interface objects [(a ***different user interface***)].”

EX1004 (Chaudhri), [0220-0221] Figures 5B-5D.



EX1004 (Chaudhri), Figures 5C-D (annotated)

20. Claim 38

- (i) ***Element [38]*** The electronic device of claim 1, wherein the electronic device is configured such that, in accordance with the determination that the first single-finger touch input meets the one or more movement criteria, at least a portion of a different user interface is displayed on at least a portion of the display that was previously occupied by at least multiple of the plurality of application icons in the application launching user interface immediately prior to detecting the first single-finger touch input.

133. The Chaudhri-Martyn-Griffin combination renders obvious Element [38] and Claim 38 as a whole including for all the reasons discussed above at Element [37] regarding the shift from the original application menu page (***application launching user interface***, per Element [1.f]) to the next application

menu page (*a different user interface*). Additionally, as discussed at Elements [1.f]-[1.g], Chaudhri discloses or renders obvious that the original application menu page, including its *plurality of application icons*, is displayed *immediately prior to detecting the first single-finger touch input*. See also EX1004 (Chaudhri), Figures 5A-5D.

21. Claim 39

- (i) *Element [39] The electronic device of claim 1, wherein the electronic device is configured such that, in accordance with the determination that the first single-finger touch input meets the one or more movement criteria, at least a portion of the application launching user interface is changed to display at least a portion of a different user interface on a portion of the display that was previously occupied by at least multiple of the plurality of application icons in the application launching user interface immediately prior to detecting the first single-finger touch input.*

134. The Chaudhri-Martyn-Griffin combination renders obvious Element [39] and Claim 39 as a whole for all the reasons discussed above at Elements [37], [38].

22. Claim 40

- (i) *Element [40] The electronic device of claim 1, wherein the electronic device is configured such that, in accordance with the determination that the first single-finger touch input meets the one or more movement criteria, at least a portion of the application launching user interface is ceased to be displayed.*

135. The Chaudhri-Martyn-Griffin combination renders obvious Element [40] and Claim 40 as a whole including for all the reasons discussed above at

Element [37] regarding Chaudhri's teaching to replace (*cease to display*) the original application menu page (*application launching user interface*, per Element [1.f]) with the next application menu page. *See also* EX1004 (Chaudhri), Figures 5A-5D.

23. Claim 41

- (i) *Element [41] The electronic device of claim 1, wherein the electronic device is configured such that the floating is a function of the movement of the first application icon.*

136. The Chaudhri-Martyn-Griffin combination renders obvious Element [41] and Claim 41 as a whole. As I discussed at Element [1.l] and Sections VIII.A, VIII.D, Chaudhri's teachings regarding the "reconfiguration mode" also establish or render obvious the concept of a *floating movement of the first application icon* across the display at different locations in accordance with a drag touch moving the application icon. EX1004 (Chaudhri), [0220], [0282-0283], [0348], Figures 5B-5E, 5M-5N, 5JJ-5MM. As also discussed at element [1.l], the first application moves across the screen at a layer that is higher than a layer of the non-moving application icons in addition to being above the "wallpaper *background*" layer as *a function of the movement of the first application icon*. EX1004 (Chaudhri), [0282-0283], [0348]; Figures 5B-5E, 5M-5N, 5JJ-5MM. Accordingly, as a POSITA would have understood, the manner in which *the first application icon floats* depends on (*is a function of*) *the movement*—e.g., movement across the screen.

24. Claim 42

- (i) *Element [42] The electronic device of claim 1, wherein the electronic device is configured such that an action is performed utilizing the first application in response to detection of a selection of at least one of the one or more action option objects.*

137. The Chaudhri-Martyn-Griffin combination renders obvious Element [42] and Claim 42 as a whole including for all the reasons discussed above at Element [1.j] (explaining that Martyn’s App Snapshot provides selectable **action option objects** for performing “common functions” (**actions**) within **the first application**) and Elements [19]-[22] (discussing **actions** associated with Martyn’s “Messages” **application** that are accessible via the App Snapshot).

25. Claim 43

- (i) *Element [43] The electronic device of claim 1, wherein the electronic device is configured such that an action is performed utilizing another application other than the first application in response to detection of a selection of at least one of the one or more action option objects.*

138. The Chaudhri-Martyn-Griffin combination renders obvious Element [43] and Claim 43 as a whole. As discussed, this combination includes Martyn’s teachings about an App Snapshot presenting **one or more action option objects**. Above, Element [1.g], [1.j], Section VIII.D. In a particular example, Martyn teaches a “contacts manager” (**first application**) with an associated “App Snapshot” listing the “email addresses” (**action option objects**) of various contacts. EX1005 (Martyn), [0030]. In response to a user **selecting** the email address of a given contact, the

device ***performs an action utilizing another application***—an email application—to create “a new email form seeded with [the contact’s] email address.” EX1005 (Martyn), [0030].

26. Claim 47

- (i) ***Element [47] The electronic device of claim 1, wherein the electronic device is configured such that, during detection of the first single-finger touch input and prior to displaying the one or more action option objects, a user interface element is displayed to appear at least partially behind the first application icon.***

139. The Chaudhri-Martyn-Griffin combination renders obvious Element [45] and Claim 45 as a whole for all the reasons discussed above at Section VIII.A (explaining that Chaudhri’s user interface pages for the application menu include a background wallpaper (***user interface element***) ***displayed to appear behind the first application icon***), Element [1.1] (similar), and Element [1.g] (discussing ***the detection of a single-finger touch input*** while displaying the application menu).

27. Claim 57

- (i) ***Element [57] The electronic device of claim 1, wherein the electronic device is configured such that at least one of the one or more action option objects includes content that is dynamically generated.***

140. The Chaudhri-Martyn-Griffin combination renders obvious Element [57] and Claim 57 as a whole. As discussed, this combination includes Martyn’s teachings about an App Snapshot presenting ***one or more action option objects*** in the form of “common functions” of the associated application. Above, Element

[1.g], [1.j], Section VIII.D. Martyn also teaches that the device “may be able to learn what functionality [of the application]...[is] most likely to be of interest to a given user and which should therefore be included in a summary view to any given user.” EX1005 (Martyn), [0026]. In this way, the “constituency of the App Snapshot can [] vary as determined by...usage patterns of the user” in a **dynamic** way. EX1005 (Martyn), [0026].

28. Claim 58

- (i) ***Element [58] The electronic device of claim 1, wherein the electronic device is configured such that at least one of the one or more action option objects includes content that is dynamically generated based on historical usage.***

141. The Chaudhri-Martyn-Griffin combination renders obvious Element [58] and Claim 58 as a whole for all the reasons discussed above at Element [57] (discussing Martyn’s teaching to ***dynamically generate the action option objects*** of the App Snapshot based on application “***usage*** patterns”).

29. Claim 59

- (i) ***Element [59] The electronic device of claim 1, wherein the electronic device is configured such that at least one of the one or more action option objects includes content that is dynamically generated based on historical usage of the first application.***

142. The Chaudhri-Martyn-Griffin combination renders obvious Element [59] and Claim 59 as a whole for all the reasons discussed above at Element [57]

(discussing Martyn’s teaching to *dynamically generate the action option objects* of the App Snapshot based on application “*usage* patterns”).

30. Claims 63, 71, 74, 81-84, 86-94, 97-105, 109, 119-121, 124

143. Claims 63, 71, 74, 81-84, 86-94, 97-105, 109, 119-121 are substantially similar to claims 1, 9, 12, 19-22, 24-32, 35-43, 47, 57-59, respectively. Claim 124 is substantially similar to claim 1. These respective claim sets recite a similar series of steps in different forms and statutory categories—namely, as an “electronic device” with “one or more programs including instructions” to perform the steps (Claims 1, 9, 12, 19-22, 24-32, 35-43, 47, 57-59), as a “method” comprised of those steps (Claims 63, 71, 74, 81-84, 86-94, 97-105, 109, 119-121), and as a “on-transitory computer readable storage medium” with “one or more programs comprising instructions” to perform the steps (Claim 124). Accordingly, the Chaudhri-Griffin- Martyn combination satisfies Claims 63, 71, 74, 81-84, 86-94, 97-105, 109, 119-121, 124 for the same reasons discussed above regarding claims 1, 9, 12, 19-22, 24-32, 35-43, 47, 57-59. The tables below identify the corresponding elements between these two claim sets using the identifiers from the listing of claims at the outset of this Declaration.

Claim 63	
[63.pre]	N/A
[63.a]	See [1.a] and [1.b]
[63.b]	See [1.f]
[63.c]	See [1.g]
[63.d]	See [1.h]
[63.e]	See [1.i]
[63.f]	See [1.j]
[63.g]	See [1.k]
[63.h]	See [1.l]

Claim 71	
[71]	See [9]

Claim 74	
[74]	See [12]

Claim 81	
[81]	See [19]

Claim 82	
[82]	See [20]

Claim 83	
[83]	See [21]

Claim 84	
[84]	See [22]

Claim 86	
[86]	See [24]

Claim 87	
[87]	See [25]

Claim 88	
[88]	See [26]

Claim 89	
[89]	See [27]

Claim 90	
[90]	See [28]

Claim 91	
[91]	See [29]

Claim 92	
[92]	See [30]

Claim 93	
[93]	See [31]

Claim 94	
[94]	See [32]

Claim 97	
[97]	See [35]

Claim 98	
[98]	See [36]

Claim 99	
[99]	See [37]

Claim 100	
[100]	See [38]

Claim 101	
[101]	See [39]

Claim 102	
[102]	See [40]

Claim 103	
[103]	See [41]

Claim 104	
[104]	See [42]

Claim 105	
[105]	See [43]

Claim 109	
[109]	See [47]

Claim 119	
[119]	See [57]

Claim 120	
[120]	See [58]

Claim 121	
[121]	See [59]

Claim 124	
[124.pre]	See [1.a], [1.b], [1.c], [1.d], [1.e]
[124.a]	See [1.f]
[124.b]	See [1.g]
[124.c]	See [1.h]
[124.d]	See [1.i]
[124.e]	See [1.j]
[124.f]	See [1.k]
[124.g]	See [1.l]

IX. GROUND 2: CHAUDHRI, MARTYN, GRIFFIN, Os

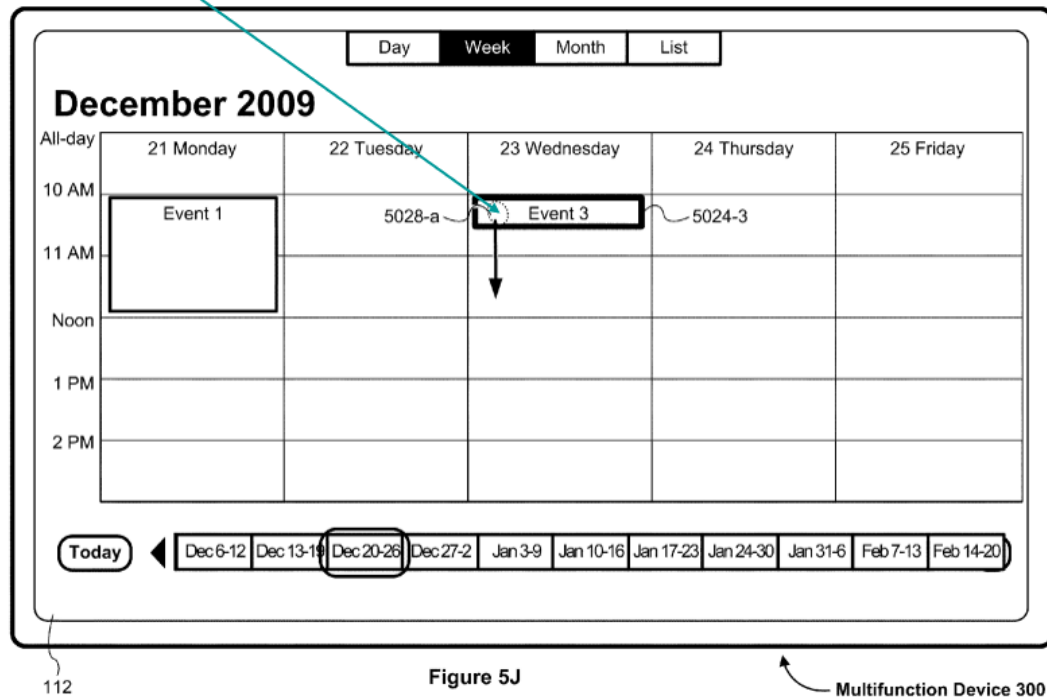
144. Ground 2 is identical to, and incorporates the analysis of, Ground 1 in all but one respect. Ground 2 introduces the additional disclosure of Os to provide an alternative basis for rendering obvious the notion of a continuous touch contact between Chaudhri's touch-and-hold gesture to invoke the "reconfiguration mode" (Element [1.k]) and Chaudhri's drag gesture to move the application icon (Element [1.l]). Integrating Os' disclosure of continuous multipart gestures does not disturb

the aspects of Chaudhri, Griffin, and Martyn mapped to the remaining claims and elements discussed above in Ground 1.

A. Os (EX1007)

145. Os discloses devices methods, and graphical user interfaces for manipulating selectable user interface objects. EX1007 (Os), [0007]. Os, a published patent application filed in 2010, demonstrates that “continuous multipart gesture[s]” were known and implemented before the ’758 patent was filed. EX1007 (Os), [0182]. In one example, Os describes detecting a “tap and hold gesture” on a “touch-sensitive surface...for more than a predetermined period of time...and subsequent lateral movement of the contract.” EX1007 (Os), [0182]. Here, Os describes using a touch-and-hold gesture to create a calendar event and a subsequent drag gesture to adjust the start and end times of that event. EX1007 (Os), [0182], Figure 5J.

Continuous Multipart Gesture includes a “tap and hold gesture” to create a calendar event (“Event 3”) and a subsequent movement of the contact to change the start and end times of the calendar event



EX1007 (Os), Figure 5J (annotated)

B. The Combination, Reasons to Combine, & Expectation of Success

146. As I discussed above, a POSITA would have been motivated to combine Chaudhri, Martyn, Griffin to arrive at the predictable result outlined above in Section VIII.D. There are multiple reasons that would have motivated a POSITA to further incorporate the “continuous multipart gesture[s]” taught by Os in conjunction with Chaudhri’s touch-and-hold gesture to enter the “reconfiguration mode” and subsequent drag gesture to move an application icon.

147. First, integrating continuous multipart gestures would predictably improve Chaudhri by making the user interface more intuitive to use. As discussed throughout Ground 1, Chaudhri's device recognizes and responds to a touch-and-hold gesture at an application icon to enter a "reconfiguration mode." EX1004 (Chaudhri), [0217-0218], [0313], Figures 5B, 7A, 7B. One primary purpose of the "reconfiguration mode" is to rearrange application icons, and the user would expect this functionality to manifest immediately. EX1004 (Chaudhri), [0015]. It could be confusing and frustrating to some users if they were forced to break contact with the touch screen before executing a drag gesture to move an application icon. To avoid these usability problems, a POSITA would have been motivated to make the touch-and-hold and drag gestures detectable as part of a "continuous multipart gesture," as taught by Os.

148. Second, a POSITA would have been motivated to incorporate Os' "continuous multipart gesture" teaching in this way to increase the efficiency of the user interface. Simply put, the POSITA would have appreciated that an experienced user would be able to input one continuous multipart gesture more quickly than two distinct gestures. Combining Chaudhri's touch-and-hold and drag gestures in this way would allow users to accomplish the task of moving an application icon faster and with fewer finger movements.

149. Third, continuous multipart gestures were well known and commonly used for interacting with a touch screen user interface by 2011. Such gestures were a well-known solution to the well-known problem of recognizing a series of related touch input commands. *See, e.g.*, Element [1.l] at Ground 1 (*above* at ¶110). Os implements a continuous multipart gesture to perform the related tasks of creating and manipulating an event GUI element in a calendar application (EX1007 (Os), [0182]), and it would have been axiomatic for a POSITA to do the same in the context of Chaudhri's related tasks of entering a "reconfiguration mode" and moving an application icon.

C. Element-by-Element Analysis

150. As discussed, Ground 2 is substantively identical to, and incorporates the analysis of, Ground 1. Ground 2 differs in that it relies on the additional disclosure of Os to provide an alternative basis for rendering obvious the notion of a continuous touch contact between Chaudhri's touch-and-hold gesture to invoke the "reconfiguration mode" (Element [1.k]) and Chaudhri's drag gesture to move the application icon (Element [1.l]). Integrating Os's teachings does not disturb the aspects of Chaudhri, Griffin, and Martyn mapped to the remaining claims and elements discussed above in Ground 1. To reduce repetition, and because the analysis of all other claim elements is identical, only Element [1.l] is addressed here in Section VI.B.3.

- (i) ***Element [1.l] in accordance with a determination that the first single-finger touch input meets the one or more movement criteria, moving the first application icon in a foreground virtual display layer so that the first application icon appears to float above a background virtual display layer.***

151. The Chaudhri-Martyn-Griffin-Os combination renders obvious Element [1.l] and Claim 1 as a whole.

152. As I discussed above in Section VIII.E.1.(x) (Element [1.k]), the Chaudhri-Martyn-Griffin combination teaches ***determining that the first single-finger touch input meets the one or more movement criteria and moving the first application icon in a foreground virtual display layer so that the first application icon appears to float above a background virtual display layer*** when the user executes a drag gesture while the device is in the “reconfiguration mode.”

153. Moreover, Os teaches a “continuous multipart gesture” that includes a “tap and hold gesture” combined with “subsequent lateral movement of the contact,” all while the user’s finger remains down on the touch screen. EX1007 (Os), [0182], Figure 5J; *above* Section IX.A (brief description of Os). As I discussed above at section IX.B, a POSITA would have been motivated to apply Os’s teachings to the Chaudhri-Martyn-Griffin combination to provide functionality for accommodating Chaudhri’s touch-and-hold gesture and drag gesture as a single “continuous multipart gesture.” In this way, the user could execute the touch-and-hold gesture to enter the “reconfiguration mode” and subsequently execute the drag gesture to

move an application icon without lifting their finger from the touch screen—i.e., as a single continuous touch input.

X. CONCLUSION

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

Executed this 26th day of June, 2024.

A handwritten signature in black ink, appearing to read 'Andrew Cockburn', written over a horizontal line.

Andrew Cockburn

APPENDIX A

Andy Cockburn

B.Sc.(Hons) Ph.D.

Curriculum Vitae

Full legal name	Andrew Jeremy Gavin Cockburn
University Address	Department of Computer Science and Software Engineering University of Canterbury Christchurch 8140 New Zealand
Telephone	+64 3 369 2119
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Date of birth	23rd July 1966
Date	June 24, 2024

Brief Summary

International research reputation

- Over one hundred and ninety publications in international journals and conferences.
- Elected to the CHI Academy (2015), which is an honorary group of individuals who have made substantial contributions to the field of human-computer interaction.
- Recipient of the 2009 Chris Wallace award for the outstanding research contribution to Computer Science (2005-2007) in Australasia.
- Deputy Chair of the national panel for assessing Computer Science and Mathematics research quality (MIST PBRF panel, 2016-2019).
- Technical programme committee chair for ACM CHI 2020; Papers co-chair for ACM CHI 2014 and 2015.
- Editorial Board Member for: ACM Transactions on Computer-Human Interaction (2012-2021); Human-Computer Interaction Journal (2015-); Foundations and Trends in HCI (2015-2023); International Journal of Human-Computer Studies (2004-2013); Interacting with Computers (2003-2013).
- Best paper awards at CHI 2018, 2013, 2012, 2011 (awarded to the top 1% of submissions) and 13 Honourable Mention awards (top 5%) at ACM CHI.
- H-index impact factor of 56 (Google Scholar).

Excellent educator and public speaker

- Long track record of outstanding student evaluations.
- Nominated for the New Zealand National Tertiary Teaching Award, 2010. Recipient of a University of Canterbury Teaching Award (2004) and many nominations for student-elected 'lecturer of the year' award.

Experienced expert witness and consultant

- Testifying expert witness on behalf of industry leaders in various jurisdictions, including the Federal Court of Australia, US Federal Court, US Patent Trial and Appeal Board, and the US International Trade Commission.

Education

Degree	PhD (June 1993)
Discipline	Computer Science — Computer Supported Cooperative Work
Location	University of Stirling, Scotland
Thesis Title	Groupware Design: Principles, Prototypes, and Systems

Degree	BSc(Hons) (July 1988)
Discipline	Computer Science
Location	University of York, England

Employment History

Position	Professor (promoted through lecturer, senior lecturer, associate professor)
Location	University of Canterbury Christchurch New Zealand
Period	June 1993 — current

Research Student Supervision

PhD candidates

Stewart Dowding	2021–	Interaction Pace and User Preferences
Pang Suwanaposee	2020–	Cognitive Biases and the Subjective Experience of Interaction
Sarmad Soomro	2017–2021	Interaction with In-Vehicle Touchscreens
Joshua Leung	2013–2017	Understanding the Noticeability and Distraction of Interactive Highlighting Techniques
Philip Quinn	2012–2016	Economic Behaviour & Psychological Biases in Human-Computer Interaction
Tham Piumsomboon	2011–2015	Adaptive and Multimodal Interfaces for Collaborative Augmented Reality
Joey Scarr	2011–2014	Improving Interaction with Spatial User Interfaces
Stephen Fitchett	2010–2013	Understanding and Improving Personal File Retrieval
Susanne Tak	2008–2011	Improving Interfaces for Window/Task Switching
Jason Alexander	2006–2009	Improving Interfaces for Document Navigation
Joerg Hauber	2004–2008	Understanding Remote Collaboration in Video Collaborative Virtual Environments
Julian Looser	2003–2007	AR Magic Lenses: Addressing the Challenge of Focus and Context in Augmented Reality
Volkert Buchmann (A. sup.)	2004–2008	Haptic Feedback in Augmented Reality
Carl Cook (A. sup.)	2002–2006	Collaborative Software Engineering
Tim Wright	2000–2004	Collaborative and Multiple-Notation Programming Environments for Children
Michael JasonSmith	2000–2006	User Interfaces for Temporal Awareness

M.Sc. candidates

Ben McDonald	2010–2011	Multuser interaction with large public displays
Dominic Winkler	2009–2011	Interaction Techniques for Cross Context Activities
Taher Amer	2005–2006	Evaluating SwiftPoint
Trond Nilsen	2004–2006	Hybrid Interfaces in Augmented Reality
Joshua Savage	2003–2004	The Calibration and Evaluation of Speed-Dependent Automatic Zooming Interfaces
Ben Schmidt	2001–2002	A Study of Bimanual Interaction
Elizabeth Ng (A. sup.)	1997–1998	Pen-based music input
Aaron Tay	1994–5	End-User Tailorability in Workflow Design

Honours candidates and Honours-level interns

Joel Harrison	2012	Improving Command Selection
Joshua Leung	2012	Improving File Access
Jerome Delamarche	2010	Multiple Trajectory Pointing Methods
Joey Scarr	2010	Improving Expertise Development in User Interfaces
Stephen Fitchett	2009	Improved Mobile Scrolling Interfaces
Philip Quinn	2007	Improving Command Interfaces
Keith Humm	2007	Improving Interfaces for Task Switching
Jason Alexander	2005	Improving Document Navigation with Space-Filling Thumbnails
Philip Brock	2005	An Investigation of Target Acquisition with Visually Expanding Targets in Constant Motor-Space
David Mitchell	2003	Evaluating Focus+Context Screens
Andrew Wallace	2003	Calibrating Speed-Dependent Automatic Zooming
Andrew Barrett	2002	Implementing RSVP as an Image Browser
Julian Looser	2002	3D Games as Motivation in Fitts' Law Experiments
Joshua Savage	2002	Implementing and Evaluating Speed-Coupled Scrolling
Amal Siresena	2002	Mobile Text Entry
Michael Moyle	2001	An Evaluation of Simple Gesture Based Controls
Lee Butts	2001	Mobile Phone Text Entry
Eddie Edwards	2001	Towards Scalable Interfaces Using Spatial Cues
Gene Thomas	1997	Smart Desktop
Olof Eilert	1997	User Interfaces for Object Oriented Literate Programming
Philip Weir	1996	Distortion Oriented Workspace Awareness
Carey Evans	1996	Assisting World Wide Web Navigation
Justin Macfarlane	1995	Mawd: A Collaborative Analysis Tool
Carl Cerecke	1995	TRAIL: An Email Based CSCW Toolkit
Andrew Bryant	1995	Leogo: An Equal Opportunity Programming Environment
Ian Bosely	1994	SPI: A Social Presence Indicator

Postgraduate Thesis Examinations

Katherine Fennedy	PhD	External Examiner	Singapore University of Tech. & Design	2021
Praveenkumar Kanithi	PhD	Chair	University of Canterbury	2020
Ori Gagoni	PhD	Chair	University of Canterbury	2019
Alaeddin Nassani	PhD	Chair	University of Canterbury	2019
Veera Mandalika	PhD	Chair	University of Canterbury	2018
Jessalyn Alvina	PhD	Examiner	Université Paris Sud	2017
Hyungon Kim	PhD	Chair	University of Canterbury	2017
Thomas Young	PhD	Chair	University of Canterbury	2017
Craig Sutherland	PhD	Examiner	University of Auckland	2016
David Thompson	PhD	Chair	University of Canterbury	2016
Philip Quinn	PhD	Supervisor	University of Canterbury	2016
Daniel Bradley	PhD	Examiner	University of Queensland	2016
David Altimera	PhD	Chair	University of Canterbury	2015
Jakub Zlotowsky	PhD	Chair	University of Canterbury	2015
Thammathip Piumsomboon	PhD	Supervisor	University of Canterbury	2015
Robert Schattschnieder	PhD	Chair	University of Canterbury	2014
Hazel Bradshaw	PhD	Chair	University of Canterbury	2014
Amur Al Manji	PhD	Examiner	University of Auckland	2014
Amir Shareghi Najar	PhD	Chair	University of Canterbury	2014
Joey Scarr	PhD	Supervisor	University of Canterbury	2014
Stephen Fitchett	PhD	Supervisor	University of Canterbury	2014
Amali Weeseringhe	PhD	Chair	University of Canterbury	2012
Sayan Ray	PhD	Chair	University of Canterbury	2012
Christina Dicke	PhD	Chair	University of Canterbury	2012
Minkyung Lee	PhD	Chair	University of Canterbury	2010
Jason Alexander	PhD	Supervisor	University of Canterbury	2009
Leah Findlater	PhD	Examiner	University of British Columbia	2009
Judy Bowen	PhD	Examiner	University of Waikato	2008
Joerg Hauber	PhD	Supervisor	University of Canterbury	2008
Julian Looser	PhD	Supervisor	University of Canterbury	2008
Michael JasonSmith	PhD	Supervisor	University of Canterbury	2006
Tim Wright	PhD	Supervisor	University of Canterbury	2005
Beryl Plimmer	PhD	Examiner	University of Waikato	2003
Gorden Paynter	PhD	Examiner	University of Waikato	2000
Gitesh K Raikundalia	PhD	Examiner	Bond University	1997
Ramon Craig Standing	PhD	Examiner	University of Western Australia	1997
Ying Leung	PhD	Examiner	Massey University	1995
Qi Min Ser	Masters	Examiner	University of Canterbury	2016
Taher Amer	Masters	Supervisor	University of Canterbury	2006
Trond Nilsen	Masters	Supervisor	University of Canterbury	2006
Akhil Mehra	Masters	Examiner	University of Auckland	2005
Aparna Krishnan	Masters	Examiner	University of Waikato	2003
Shaun Kaasten	Masters	Examiner	University of Calgary	2001
Boyd Ludlow	Masters	Examiner	University of Waikato	1999
Donald Cox	Masters	Examiner	University of Calgary	1998
Wallace Chigona	Masters	Examiner	Waikato University	1997
Simon Gianoutsos	Masters	Examiner	Waikato University	1997
Jing Deng	Masters	Examiner	Waikato University	1996 and 1997
Aaron Tay	Masters	Examiner	University of Canterbury	1996

Student glory

Pang Suwanaposee	PhD	2022	Google PhD Fellowship Award AUD\$15,000.
Pang Suwanaposee	PhD	2021	CHI Honourable Mention award.
Joey Scarr	PhD	2016	John Makepeace Bennett Award for the Distinguished Computer Science PhD thesis in Australasia.
Philip Quinn	PhD	2015	US Patent Awarded (Google Assignee).
Philip Quinn	PhD	2014	US Patent Awarded (Google Assignee).
Stephen Fitchett	PhD	2014	CHI Honourable Mention award.
Philip Quinn	PhD	2013	Google Mountain View Internship.
Stephen Fitchett	PhD	2013	CHI Best Paper award.
Joey Scarr	PhD	2013	CHI Honourable Mention award.
Joey Scarr	PhD	2013	CHI ReplicCHI award.
Joey Scarr	PhD	2012	CHI Best Paper award.
Stephen Fitchett	PhD	2012	CHI Honourable Mention award.
Philip Quinn	PhD	2012	Google Mountainview Internship.
Joey Scarr	PhD	2012	Google Sydney Internship.
Stephen Fitchett	PhD	2011	Outstanding reference from Darren Edge, Microsoft Research Asia.
Joey Scarr	PhD	2012	\$3K for 2nd place in University 'PhD in 3' competition.
Joey Scarr	PhD	2012	\$1K for 1st place in College 'PhD in 3' competition.
Stephen Fitchett	PhD	2012	\$1K for 3rd place in College 'PhD in 3' competition.
Philip Quinn	PhD	2011	Honourable Mention award ACM CHI'11.
Joey Scarr	PhD	2011	Google Sydney Internship.
Susanne Tak	PhD	2010	\$5K Google Anita Borg Scholarship
Susanne Tak	PhD	2010	\$3K from ACM for participation at CHI's Doctoral Consortium
Jason Alexander	PhD	2010	PhD Thesis placed on "Dean's list for excellence" (top 10%)
Susanne Tak	PhD	2009	\$2K award for 1st place in College Research Poster competition
Jason Alexander	PhD	2008	\$1K award for 2nd place in College Research Poster competition
Jason Alexander	PhD	2008	Michael Sweeney award for best student paper, Graphics Interface '08.
Mark Hancock	PhD	2007	Best paper nomination at ACM CHI'07.
Josh Savage and Andrew Wallace	M.Sc. Hons	2005	Best paper nomination at ACM CHI'05.
Mike Moyle	Hons	2005	NZ Hi-Tech Young Achiever of the Year Award

Publications

Edited Volumes

- EV1 J McGrenere and A Cockburn (Eds.) Proceedings of ACM CHI 2020 Conference on Human Factors in Computing Systems.
- EV2 J McGrenere and A Cockburn (Eds.) Extended Abstracts of ACM CHI 2020 Conference on Human Factors in Computing Systems.
- EV3 M Billinghamurst and A Cockburn (Eds.) Proceedings of the Sixth Australasian User Interface Conference (AUI2005). Volume 40 of the Conferences in Research and Practice in Information Technology, Australian Computer Society.
- EV4 A Cockburn (Ed.) Proceedings of the Fifth Australasian User Interface Conference (AUI2004). Volume 28 of the Conferences in Research and Practice in Information Technology, Australian Computer Society.

Papers in Refereed Journals and Collections

- J1 A Cockburn, D Hills, Z Che, and C Gutwin. User Interface Evaluation Through Implicit-Association Tests. *Proceedings of the ACM on Human-Computer Interaction*. EICS, Article v8eics262. 2024.
- J2 A Cockburn, A Goguey, C Gutwin, Z Chen, P Suwanaposee, and S Dowding. Automatically Adapting System Pace Towards User Pace – Empirical Studies. *International Journal of Human-Computer Studies*. 185:103228. May. 2024.
- J3 S Dowding, C Gutwin, and A Cockburn. User Speech Rates and Preferences for System Speech Rates. *International Journal of Human-Computer Studies*. 184:103222. April. 2024.
- J4 P Suwanaposee, C Gutwin, and A Cockburn. The Influence of Audio Effects and Attention on the Perceived Duration of Interaction. *International Journal of Human-Computer Studies*. 159:102756. March. 2022.
- J5 J Leung and A Cockburn. Design Framework for Interactive Highlighting Techniques. *Foundations and Trends in Human-Computer Interaction*. 14(2-3):96-271. 2021.
- J6 AF Mairena, C Gutwin, and A Cockburn. Which Emphasis Technique to Use? Perception of Emphasis Techniques with Varying Distractors, Backgrounds, and Visualization Types. *Information Visualization*. 21(2):95-129. 2022.
- J7 A Cockburn, P Dragicevic, L Besançon and C Gutwin. Threats of a Replication Crisis in Empirical Computer Science. *Communications of the ACM*. 63(8):70-79. August 2020.
- J8 M Claypool, A Cockburn and C Gutwin. The Impact of Motion and Delay on Selecting Game Targets with a Mouse. *ACM Transactions on Multimedia Computing, Communications, and Applications*. 16(2s):73, 1-14. June 2020.
- J9 P Quinn and A Cockburn. Loss Aversion and Preference in Interaction. *Human-Computer Interaction Journal*. 35(2):143-190. 2020. (Online from 2018).

- J10 A Cockburn, D Masson, C Gutwin, P Palanque, A Goguet, M Yung, C Gris and C Trask. Design and Evaluation of Braced Touch for Touchscreen Input Stabilisation. *International Journal of Human-Computer Studies*. 122:21-37. 2018.
- J11 B Lafreniere, C Gutwin, and A Cockburn. Investigating the Post-Training Persistence of Expert Interaction Techniques. *ACM Transactions on Human-Computer Interaction*. 24(4): Article 29 (46 pages). 2017.
- J12 A Cockburn, P Quinn and C Gutwin. The Effects of Interaction Sequencing on User Experience and Preference. *International Journal of Human-Computer Studies*. 108:89-104. 2017.
- J13 J Aceituno, S Malacria, P Quinn, N Roussel, A Cockburn and G Casiez. The Design, Use, and Performance of Edge-Scrolling Techniques. *International Journal of Human-Computer Studies*. 97:58-76. 2017.
- J14 J Scarr, C Gutwin, A Cockburn and A Bunt. StencilMaps and EphemeralMaps: Spatially Stable Interfaces that Highlight Command Subsets. *Behaviour and Information Technology*. 34(11):1092-1106. 2015.
- J15 S Fitchett and A Cockburn. An Empirical Characterisation of File Retrieval. *International Journal of Human-Computer Studies*. 74:1-13. 2015.
- J16 A Cockburn, C Gutwin, J Scarr and S Malacria. Supporting Novice to Expert Transitions in User Interfaces. *ACM Computing Surveys*. 47(2):31:1-36. 2014.
- J17 J Scarr, A Cockburn and C Gutwin. Supporting and Exploiting Spatial Memory in User Interfaces. *Foundations and Trends in Human-Computer Interaction*. 6(1):1-84. 2013.
- J18 P Quinn, A Cockburn and J Delamarche. Examining the Costs of Multiple Trajectory Pointing Techniques. *International Journal of Human-Computer Studies*. 71(4):492-509. 2013.
- J19 S Tak and A Cockburn. Enhanced Spatial Stability with Hilbert and Moore Treemaps. *Transactions on Visualization and Computer Graphics*. 19(1):141-148. 2013.
- J20 A Cockburn, D Ahlstrom and C Gutwin. Understanding Performance in Touch Selections: Tap, Drag, and Radial Pointing Drag with Finger, Stylus and Mouse. *International Journal of Human-Computer Studies*. 70(3):218-233. 2012.
- J21 J Hauber, A Cockburn, M Billinghamurst and H Regenbrecht. The Impact of Collaborative Style on the Perception of 2D and 3D Videoconferencing Interfaces. *Open Software Engineering Journal*. 6:1-20. 2012.
- J22 A Cockburn, P Quinn, C Gutwin, G Ramos and J Looser. Air Pointing: Design and Evaluation of Spatial Target Acquisition with and without Visual Feedback. *International Journal of Human-Computer Studies*. 69:401-414. 2011.
- J23 E Tanvir, A Bunt, A Cockburn and P Irani. Improving Cascading Menu Selections with Adaptive Activation Areas. *International Journal of Human-Computer Studies*. 69:769-785. 2011.
- J24 A Cockburn and C Gutwin. A Model of Novice and Expert Navigation Performance in Constrained Input Interfaces. *ACM Transactions on Computer-Human Interaction*. ACM Press. 7(3):1-38. 2010.

- J25 A Cockburn and C Gutwin. A Predictive Model of Human Performance with Scrolling and Hierarchical Lists. *Human-Computer Interaction Journal*. Taylor and Francis. 24(3): 273-314. 2009.
- J26 A Cockburn, A Karlson and B Bederson. A Review of Overview+Detail, Zooming, and Focus+Context Interfaces. *ACM Computing Surveys*. ACM Press. 41(1): 1-31. 2008.
- J27 J Alexander, A Cockburn and R Lobb. AppMonitor: A Tool for Recording User Actions in Unmodified Windows Applications. *Behavior Research Methods*. Psychonomic Society. 40(2): 413-421. 2008.
- J28 G Casiez, D Vogel, R Balakrishnan and A Cockburn. The Impact of Control-Display Gain on User Performance in Pointing Tasks. *Human-Computer Interaction Journal*. Taylor and Francis. 23(3): 215-250. 2008.
- J29 S Jones, M Jones, G Marsden, D Patel and A Cockburn. An Evaluation Of Integrated Zooming and Scrolling On Small Screens *International Journal of Human-Computer Studies*. 63(3): 271–303. Elsevier Science. 2005.
- J30 A Cockburn and S Brewster. Multimodal Feedback for the Acquisition of Small Targets *Ergonomics*. Taylor & Francis. 48(9): 1129–1150. 2005.
- J31 M Moyle and A Cockburn. A Flick in the Right Direction: A Case Study of Gestural Input *Behaviour and Information Technology*. 24(4): 275–288. Taylor & Francis. 2005.
- J32 A Cockburn. Web Browsers *Berkshire Encyclopedia of Human-Computer Interaction*. Bainbridge, WS (Editor). Volume 1: 80–83. Berkshire Publishing. 2004.
- J33 A Cockburn and B McKenzie. Evaluating Spatial Memory in Two and Three Dimensions *International Journal of Human-Computer Studies*. 61(3): 359–373. Elsevier Science. 2004.
- J34 A Cockburn and M Smith. Hidden Messages: Evaluating the Efficiency of Code Elision in Program Navigation *Interacting with Computers: The Interdisciplinary Journal of Human-Computer Interaction*. 15(3): 387–407. 2003.
- J35 A Cockburn, S Greenberg, S Jones, B McKenzie and M Moyle. Improving Web Page Revisitation: Analysis, Design, and Evaluation *Information Technology and Society: Special Issue on Web Navigation*, editors B Shneiderman, J Lazar, M Ivory. 3(1): 159–183. 2003.
- J36 A Cockburn, B McKenzie and M JasonSmith. Pushing Back: Evaluating a New Behaviour for the Back and Forward Buttons in Web Browsers *International Journal of Human-Computer Studies*. 57(5):397–414. Elsevier Science. 2002.
- J37 T Bell, A Cockburn, B McKenzie and J Vargo. Digital Lectures: If You Make Them, Will Students Use Them? Constraints on Effective Delivery of Flexible Learning Systems *International Multimedia Electronic Journal of Computer-Enhanced Learning*. 3(2). Association for the Advancement of Computing in Education. 2001 This paper was one of 25 (from 115 full papers) selected from the proceedings of ED-MEDIA 2001 for adaptation and inclusion in the journal.
- J38 A Cockburn. Supporting Tailorable Program Visualisations with Literate Programming and Fish-eye Views. *Information and Software Technology*. 43(13):745–758. Elsevier Science. 2001.

- J39 A Cockburn, T Bell and B McKenzie. Death to the Office of the Nineties: An HCI Perspective on Some Problems in Modern Office Information Systems *Journal of Research and Practice in Information Technology, Special Issue on Human-Computer Interaction (HCI)*., 33(1):68–82. Australian Computer Society. 2001.
- J40 A Cockburn and B McKenzie. What Do Web Users Do? An Empirical Analysis of Web Use. *International Journal of Human-Computer Studies*, 54(6):903–922. Academic Press. 2001.
- J41 A Cockburn and S Greenberg. Issues of Page Representation and Organisation in Web Browser’s Revisitation Tools. *Australian Journal of Information Systems*, 7(2):120–127. 2000.
- J42 A Cockburn and P Weir. An Investigation of Groupware Support for Collaborative Awareness Through Distortion-Oriented Views. *International Journal of Human Computer Interaction*, 11(3):231–255. Lawrence Erlbaum Associates. 1999.
- J43 A Cockburn and S Greenberg. The Design and Evolution of TurboTurtle, a Collaborative Microworld for Exploring Newtonian Physics. *International Journal of Human-Computer Studies*, 48(6):777–801. Academic Press. 1998.
- J44 A Cockburn and A Bryant. Leogo: An Equal Opportunity User Interface for Programming. *Journal of Visual Languages and Computing*, 8(5–6):601–619. Academic Press. 1997.
- J45 A Cockburn and S Jones. Which way now? Analysing and Easing Inadequacies in WWW Navigation. *International Journal of Human-Computer Studies*, 45(1):105–129. Academic Press. 1996.
- J46 A Cockburn and S Jones. Four Principles for Groupware Design. *Interacting with Computers: The Interdisciplinary Journal of Human-Computer Interaction*, 7(2):195–210. Elsevier. 1995.
- J47 HW Thimbleby, SP Marsh, SR Jones, and AG Cockburn. Trust in CSCW. In S Scrivener, editor, *Computer-Supported Cooperative Work*, pages 253–271. Ashgate Publishing, 1994.
- J48 H Thimbleby, A Cockburn, and S Jones. Hypercard: An Object-Oriented Disappointment. In P Gray and R Took, editors, *Building Interactive Systems: Architectures and Tools*, pages 35–55. Springer-Verlag, 1992.

Papers in Refereed Conference Proceedings

- C1 K Kargut, C Gutwin, A Cockburn. Effects of Device Environment and Information Layout on Spatial Memory and Performance in VR Selection Tasks. *Proceedings of ACM CHI 2024*. Hawai’i. 2024.
- C2 P Suwanaposee, C Gutwin, Z Chen, A Cockburn. ‘Specially For You’ – Examining the Barnum Effect’s Influence on the Perceived Quality of System Recommendations. *Proceedings of ACM CHI 2023*. Hamburg, Germany. 2023.
- C3 A Cockburn, P Quinn, C Gutwin, Z Chen, P Suwanaposee. Probability Weighting in Interactive Decisions: Evidence for Overuse of Bad Assistance, Underuse of Good Assistance. *Proceedings of ACM CHI 2022*. New Orleans, USA. 2022.
- C4 K Lam, C Gutwin, M Klarkowski, and A Cockburn. More Errors vs. Longer Commands: The Effects of Repetition and Reduced Expressiveness on Input Interpretation Error, Learning, and User Preference. *Proceedings of ACM CHI 2022*. New Orleans, USA. 2022.

- c5 A Goguy, C Gutwin, Z Chen, P Suwanaposee, and A Cockburn. Interaction Pace and User Preferences. *Proceedings of ACM CHI 2021*. Yokohama, Japan. 2021. **Honourable mention award**
- c6 K Lam, C Gutwin, M Klarkowski, and A Cockburn. The Effects of System Interpretation Errors on Learning New Input Mechanisms. *Proceedings of ACM CHI 2021*. Yokohama, Japan. 2021. **Honourable mention award**
- c7 S Liu, M Claypool, A Cockburn, R Eg, C Gutwin, and K Raaen. Datasets – Moving Target Selection with Delay. *Proceedings of the 12th ACM Multimedia Systems Conference (MMSys '21)*, Istanbul, Turkey. 2021.
- c8 N Bandeira Romao Tome, M Klarkowski, C Phillips, RL Mandryk, A Cockburn, and C Gutwin. Risking Treasure: Testing Loss Aversion in an Adventure Game. *Proceedings of ACM CHI PLAY 2020 Symposium on Computer-Human Interaction in Play*. Ottawa, Canada. 2020.
- c9 P Schmid, S Malacria, A Cockburn and M Nancel. Interaction Interferences: Implications of Last-Instant System State Changes. *Proceedings of ACM UIST'2020 Symposium on User Interface Software and Technology*. Minneapolis, USA. 2020.
- c10 P Palanque, A Cockburn and C Gutwin. A Classification of Faults Covering the Human-Computer Interaction Loop. *Proceedings of SafeComp 2020: 39th International Conference on Computer Safety, Reliability and Security*. Lisbon, Portugal. 2020.
- c11 A Mairena, M Dechant, C Gutwin and A Cockburn. A Baseline Study of Emphasis Effects in Information Visualization. *Proceedings of Graphics Interface 2020*. Toronto, Canada. 2020.
- c12 C Gutwin, A Cockburn, M van der Kamp, J Storrington and C Philips. Testing the Limits of the Spatial Approach: Comparing Retrieval and Revisitation Performance of Spatial and Paged Data Organizations for Large Item Sets. *Proceedings of Graphics Interface 2020*. Toronto, Canada. 2020.
- c13 A Cockburn, B Lewis, P Quinn and C Gutwin. Framing Effects Influence Interface Feature Decisions. *Proceedings of ACM CHI 2020*. Hawai'i. 2020.
- c14 B Lewis, G d'Eon, A Cockburn and D Vogel. KeyMap: Improving Keyboard Shortcut Vocabulary Using Norman's Mapping. *Proceedings of ACM CHI 2020*. Hawai'i. 2020.
- c15 A Goguy, S Malacria, A Cockburn, and C Gutwin. Reducing Error Aversion to Support Novice-to-Expert Transitions with FastTap. *Proceedings of the 31st Francophone Conference on Human-Computer Interaction – IHM 2019*. Grenoble, France. 2019. **Best paper award**
- c16 P Palanque, A Cockburn, L Désert-Legendre, C Gutwin and Y Délérès. Brace Touch: a Dependable, Turbulence-Tolerant, Multi-Touch Interaction Technique for Interactive Cockpits. *Proceedings of the 38th International Conference on Computer Safety, Reliability and Security - SafeComp 2019*. Turku, Finland. 2019.
- c17 C Martinie, P Palanque, E Bouzekri, A Cockburn, A Canny and E Barboni. Analysing and Demonstrating Tool-Supported Customizable Task Notations. *Proceedings of the 11th ACM SIGCHI Symposium on Engineering Interactive Computing Systems*. Valencia, Spain. 2019.

- c18 Q Roy, C Zakaria, W Kim, M Nancel, ST Perrault, A Misra and A Cockburn. A Comparative Study of Pointing Techniques for Eyewear Using a Simulated Pedestrian Environment. *Proceedings of the 17th IFIP TC.13 International Conference on Human-Computer Interaction*. Cyprus. 2019.
- c19 A Cockburn and C Gutwin. Anchoring Effects and Troublesome Asymmetric Transfer in Subjective Ratings. *Proceedings of ACM CHI 2019*. Glasgow, Scotland. 2019.
- c20 AF Mairena, C Gutwin, A Cockburn and LJ Elias The Effects of Feature Combination and Task Demands on Peripheral Notifications in Large Displays. *Proceedings of ACM CHI 2019*. Glasgow, Scotland. 2019.
- c21 M Claypool, A Cockburn and C Gutwin. Game Input with Delay – Moving Target Selection Parameters. *Proceedings of ACM Multimedia Systems Conference 2019*. Amhurst, MA. 2019.
- c22 A Cockburn, D Woolley, K Tran Pham Thai, D Clucas, S Hoermann, and C Gutwin. Reducing the Attentional Demands of In-Vehicle Touchscreens with Stencil Overlays. *Proceedings of ACM Automotive UI 2018*. Toronto, Canada. 2018.
- c23 A Cockburn, C Gutwin and A Dix. HARK No More: On the Preregistration of CHI Experiments. *Proceedings of ACM CHI 2018*. Montreal, Canada. 2018. Paper 141. **Best paper award**
- c24 A Goguet, G Casiez, A Cockburn and C Gutwin. Storyboard-Based Empirical Modelling of Touch Interface Performance. *Proceedings of ACM CHI 2018*. Montreal, Canada. 2018. Paper 445. **Honourable mention award**
- c25 A Cockburn, C Gutwin, P Palanque, Y Deleris, C Trask, A Coveney, M Yung and K MacLean. Turbulent Touch: Touchscreen Input for Cockpit Flight Displays. *Proceedings of ACM CHI 2017*. Denver, CO. 2017. 6742-6753.
- c26 C Gutwin, A Cockburn and N Gough. A Field Experiment of Spatially-Stable Overviews for Document Navigation. *Proceedings of ACM CHI 2017*. Denver, CO. 2017. 5905-5916.
- c27 C Gutwin, A Cockburn and A Coveney. Peripheral Popout: The Influence of Visual Angle on Popout Effects. *Proceedings of ACM CHI 2017*. Denver, CO. 2017. 208-219.
- c28 S Uddin, C Gutwin and A Cockburn. The Effects of Artificial Landmarks on Learning and Performance in Spatial-Memory Interfaces. *Proceedings of ACM CHI 2017*. Denver, CO. 2017. 3843-3855.
- c29 P Quinn and A Cockburn. When Bad Feels Good: Assistance Failures and Interface Preferences. *Proceedings of CHI'2016*. San Jose, California. 2016. 4005-4010.
- c30 B Lafreniere, C Gutwin, A Cockburn and T Grossman. Faster Command Selection on Touchscreen Watches *Proceedings of CHI'2016*. San Jose, California. 2016. 4663-4674.
- c31 K Schramm, C Gutwin and A Cockburn. Supporting Transitions to Expertise in Hidden Toolbars *Proceedings of CHI'2016*. San Jose, California. 2016. 4687-4698.
- c32 C Gutwin, C Rooke, A Cockburn, R Mandryk and B Lafreniere. Peak-End Effects on Player Experience in Casual Games *Proceedings of CHI'2016*. San Jose, California. 2016. 5608-5619. **Honourable mention award**

- c33 C Gutwin, A Cockburn and B Lafreniere. Testing the Rehearsal Hypothesis with Two FastTap Interfaces. *Proceedings of GI'2015*. Halifax, Canada. 2015. 223-231.
- c34 A Cockburn, C Gutwin and P Quinn. Examining the Peak-End Effects of Subjective Experience. *Proceedings of CHI'2015*. Seoul, S. Korea. 2015. 357-366.
- c35 S Malacria, J Acetuno, P Quinn, G Casiez, A Cockburn, and N Roussel. Push-Edge and Slide-Edge: Scrolling by Pushing Against the Viewport Edge. *Proceedings of CHI'2015*. Seoul, S. Korea. 2015. 2773-2776.
- c36 S Fitchett, A Cockburn and C Gutwin. Finder Highlights: Field Evaluation and Design of an Augmented File Browser. *Proceedings of CHI'2014*. Toronto, Canada. 2014. 3685-3694. **Honourable mention award**
- c37 C Gutwin, A Cockburn, J Scarr and S Malacria. Faster Command Selection on Tablets with FastTap. *Proceedings of CHI'2014*. Toronto, Canada. 2014. 2617-2626.
- c38 M Nancel and A Cockburn. Causality: A Conceptual Model of Interaction History. *Proceedings of CHI'2014*. Toronto, Canada. 2014. 1777-1786. **Honourable mention award**
- c39 J Scarr, A Cockburn, C Gutwin, A Bunt, and J Cechanowicz. The Usability of CommandMaps in Realistic Tasks. *Proceedings of CHI'2014*. Toronto, Canada. 2014. 2241-2250.
- c40 SA Seah, DM Plasencia, P Bennet, A Karnik, V Ortoloc, J Knibbe, A Cockburn, and S Subramanian. SensaBubble: A Chrono-Sensory Mid-Air Display of Sight and Smell. *Proceedings of CHI'2014*. Toronto, Canada. 2014. 2863-2872. **Honourable mention award**
- c41 P Quinn, S Malacria and A Cockburn. Touch Scrolling Transfer Functions. *Proceedings of ACM UIST'2013 Symposium on User Interface Software and Technology*. St Andrews, Scotland. 2013. 61-71.
- c42 S Malacria, J Scarr, A Cockburn, C Gutwin and T Grossman. Skillometers: Reflective Widgets that Motivate and Help Users to Improve Performance. *Proceedings of ACM UIST'2013 Symposium on User Interface Software and Technology*. St Andrews, Scotland. 2013. 321-330.
- c43 M Jain, A Cockburn, and S Madhvanath. Comparison of Phone-Based Distal Pointing Techniques for Point-Select Tasks. *Proceedings of INTERACT'13*. Cape Town, South Africa. 2013. 714-721.
- c44 S Malacria, G Bailly, J Harrison, A Cockburn, and C Gutwin. Promoting Hotkey Use through Rehearsal with ExposeHK. *Proceedings of CHI'2013*. Paris, France. 2013. 573-582.
- c45 J Scarr, A Cockburn, C Gutwin, and S Malacria. Testing the Robustness and Performance of Spatially Consistent Interfaces. *Proceedings of CHI'2013*. Paris, France. 2013. 3139-3148. **Honourable mention award**
- c46 S Fitchett, A Cockburn, and C Gutwin. Improving Navigation-Based File Retrieval. *Proceedings of CHI'2013*. Paris, France. 2013. 2329-2338. **Best paper award**
- c47 T Piumsomboon, A Clark, M Billingham, and A Cockburn. User-Defined Gestures for Augmented Reality. *Proceedings of INTERACT'13*. Cape Town, South Africa. September. 2013. 282-299.

- c48 P Quinn, A Cockburn, G Casiez, N Roussel, and C Gutwin. Exposing and Understanding Scrolling Transfer Functions. *Proceedings of ACM UIST'2012 Symposium on User Interface Software and Technology*. Cambridge, Massachusetts, October. 2012. 341-350.
- c49 A Cockburn, P Quinn, C Gutwin, and S Fitchett. Improving Scrolling Devices with Document-Length-Dependent Gain. *Proceedings of CHI'2012*. Austin, Texas, May. 2012. 267-276.
- c50 J Scarr, A Cockburn, C Gutwin, and A Bunt. Improving Command Selection with CommandMaps. *Proceedings of CHI'2012*. Austin, Texas, May. 2012. 257-266. **Best paper award**
- c51 S Fitchett and A Cockburn. AccessRank: Predicting What Users Will Do Next. *Proceedings of CHI'2012*. Austin, Texas, May. 2012. 2239-2242. **Honourable mention award**
- c52 J Scarr, A Cockburn, C Gutwin, and P Quinn. Dips and Ceilings: Understanding and Supporting Transitions to Expertise in User Interfaces. *Proceedings of CHI'2011*. Vancouver, Canada, May. 2011. 2741-2750.
- c53 V Levesque, L Oram, KE MacLean, A Cockburn, N Marchuk, D Johnson, JE Colgate, and M Peshkin. Enhancing Physicality in Touch Interaction with Programmable Friction. *Proceedings of CHI'2011*. Vancouver, Canada, May. 2011. 2481-2490. **Best paper award**.
- c54 P Quinn, A Cockburn, KJ Raiha, and J Delemarche. On the Costs of Multiple Trajectory Pointing Methods. *Proceedings of CHI'2011*. Vancouver, Canada, May. 2011. 859-862. **Honourable mention award**
- c55 R Xiao, M Nacenta, RL Mandryk, A Cockburn and C Gutwin. Ubiquitous Cursor: A Comparison of Direct and Indirect Pointing Feedback in Multi-Display Environments. *Proceedings of Graphics Interface '2011*. St Johns, Canada. 2011. 135-142. **Michael A. J. Sweeney best student paper award**.
- c56 S Bateman, A Doucette, C Gutwin, RL Mandryk and A Cockburn. Effects of View, Input Device, and Track Width on Video Game Driving. *Proceedings of Graphics Interface '2011*. St Johns, Canada. 2011. 207-214.
- c57 S Tak, J Scarr, C Gutwin and A Cockburn. Supporting Window Switching With Spatially Consistent Thumbnails Zones: Design and Evaluation. *Proceedings of INTERACT'2011*. Lisbon, Portugal. 2011. 331-347.
- c58 B Ens, D Ahlstrom, A Cockburn and P Irani. Characterizing User Performance with Assisted Direct Off-Screen Pointing. *Proceedings of Mobile HCI'2011*. Stockholm. 2011. 331-347.
- c59 D Ahlstrom, A Cockburn, C Gutwin, and P Irani. Why it's Quick to be Square: Modelling New and Existing Hierarchical Menu Designs. *Proceedings of CHI'2010*. Atlanta, GA, April. 2010. 1371-1380. **Best paper nomination**.
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Patents and Patent Applications

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Other: Refereed Videos, Media Reports and Non-Refereed Publications

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Grants and industry research/consulting

Project	Source	Date	Amount
Understanding the human experience of intelligent user interfaces	Marsden. (19-UOC-021)	2020-2023	\$530,000
Travel expenses	Airbus & U. Paul Sabatier	2018	≈ \$7,000
In-Vehicle Touchscreens	NZ Science for Innovation	2017	\$200,000
Travel expenses	ACM CHI Steering Committee	2017	≈ \$4,000
Travel expenses	Australian National University	2016	≈ \$3,000
Travel expenses	Airbus & U. Paul Sabatier	2016	≈ \$5,000
Travel expenses	ACM CHI Academy Award (Seoul)	2015	≈ \$5,000
Benjamin Meaker Visiting Professorship	University of Bristol	2013	£7,000
Understanding and improving the novice to expert transition with user interfaces	Marsden. (10-UOC-020)	2011-2014	\$496,000
Dynamic Multimodal Affordances	HP Innovations Award	2011-2012	US\$40,000
Travel expenses	ACM UIST conference	June 2009	≈ \$4,000
Postdoctoral Fellow	BuildIT	2011-2012	\$116,000
Dynamic Multimodal Affordances	HP Innovations Award	2010-2011	US\$40,000
Travel expenses	ACM UIST conference	June 2009	≈ \$4,000
Scrolling device studies	Logitech Inc	2010	\$10,000
Canadian GRAND project	Canadian Centres of Excellence	2010-2014	C\$25,000,000
BuildIT Emerging Researcher Mentoring Fund	BuildIT	2010	\$8,000
Pythodogical	UC Teaching and Learning	2009-2010	\$15,000
Dynamic Multimodal Affordances	HP Innovations Award	2009-2010	US\$40,000
Travel expenses	ACM UIST conference	June 2009	≈ \$4,000
Travel expenses	ACM CHI conference	Nov. 2008	≈ \$4,000
Improving document navigation interfaces	Marsden. (07-UOC-013)	2007–2010	\$400,000
Accessible AR on Everyday Devices	FRST (UOCX0704)	2007–2011	\$1,875,000
Usability training	Jade Software	2007	≈ \$2,000
Usability training	AMI	2007	≈ \$2,000
Expenses	Logitech Inc., California	April 2007	≈ \$5,000
Expenses	Logitech Inc., California	July 2006	≈ \$2,000
Grant in aid	University of Toronto	July 2006	≈ \$8,000
Grant in aid	University of Saskatoon	June 2006	≈ \$6,000
Grant in aid	University of Calgary	May 2006	≈ \$3,000
Grant in aid	IBM Almaden Research, California	April 2006	≈ \$3,000
NOKIA Pocket (Assoc. with HIT Lab).	Nokia Research Center	2006.	≈ \$100,000.
Speed-Dependent Automatic Zooming	Computer Science	2003	\$3,000
Evaluation of Speed-Coupled Scrolling	Computer Science	2002	\$3,000
Multimedia Learning of Graphics (Assoc.)	UoC Teaching and Learning Ctte.	2002	\$5,000
Fastap Evaluation	Digit Wireless LLC, MA, USA.	2002	\$3,000
Supermedia—The MagicBook Project (Assoc.)	NZ NERF (UOCX0204)	2002	\$333,000
Practical Flexible Delivery of Virtual Learning	UoC (U6360)	1999–2002	\$40,000
Collaborative Programming for Children	Marsden, Royal Soc. (UOC805)	2000–2002	\$135,000
Evaluation of Back/Forward in Web-browsers	Computer Science	2001	\$3,000
Interfaces for WWW navigation.	Microsoft Research, USA.	1999	≈ \$8,000
HCI and multi-media research lab	Computer Science	1999	\$7,400
Video analysis and multi-media lab	UoC (2313728)	1996	\$30,000
Collaborative video analysis	Computer Science	1996	\$3,000
Collaborative microworlds	Computer Science	1995	\$4,000
Asynchronous groupware toolkits	Computer Science	1994	\$2,000

Academic Service

EiC Cttee.	2024	Search committee for ACM ToCHI Editor in Chief.
Grant reviewer	2024	French National Research Agency (ANR).
Grant reviewer	2024	Israel Science Foundation (ISF).
External assessor	2019	Promotion to Full Professor: University of Toronto.
External assessor	2018	Promotion to Full Professor: University of Cambridge.
Rapporteur	2018	Habilitation, Dr Eric Lecolinet, Université Paris Sud, France.
Rapporteur	2018	Habilitation, Dr Marcos Serrano, University Toulouse III Paul Sabatier, France.
External assessor	2017	Promotion application: University of Waterloo.
Chair	2018–2021	Technical program chair for ACM CHI 2020 Conference
Committee member	2016–2020	Steering Committee for the ACM CHI Conference
Rapporteur	2017	Habilitation, Dr Caroline Appert, University Paris-Sud, France.
Chair	2016–2018	CORE Chris Wallace Research Award Panel
Deputy Chair	2016–2018	PBRF Mathematical and Information Sciences Panel
Editorial	2015–	Editorial Board of Foundations and Trends in Human-Computer Interaction.
Editorial	2015–	Editorial Board of Human-Computer Interaction. Taylor and Francis.
Chair	2012–2015	Papers co-chair for ACM CHI 2014 and 2015 (over 2000 submissions).
Service Award.	2014.	ACM SIGCHI Recognition of Service Award.
Editorial	2012–	Editorial Board of ACM Transactions on Computer-Human Interaction. ACM.
Panel member	2011–2012	Member of the Mathematics, Information Sciences and Technology PBRF panel.
Panel member	2008–2009	BuildIT Postdoctoral Award.
Governance board	2008–2010	Elected member of the governance board of BuildIT.
Panel member	2009, 2011	Member of the Mathematics and Information Sciences Marsden panel.
Panel member	2008–2009	BuildIT Postdoctoral Award.
Panel member	2008–2010	BuildIT Emerging Reseachers Travel Fund.
Mentor	2009–2010	BuildIT mentor for early career researchers.
External assessor	2010	Docent application advisor, University of Tampere, Finland.
External assessor	2010	Promotion application for University of Auckland.
External assessor	2007, 2009	Promotion applications for INRIA, University Paris-Sud.
External assessor	2007	Postdoctoral applicants for Ryerson Univerity, Canada.
Editorial	2002–2013	Associate Editor for International Journal of Human-Computer Studies.
Editorial	2002–2013	Member Editorial Board for Interacting with Computers Journal.
Chair	2010–2011	Subcommittee Chair ACM CHI'11.
Senior Reviewing	2004–	Associate Chair (Papers) for ACM CHI'04, CHI'08, CHI'09.
Senior Reviewing	2009	Associate Chair (Papers) for ACM UIST 2009.
Senior Reviewing	2007	Short papers chair for INTERACT 2007
Chair	2004–2005	Papers chair for Australasian User Interface Conferences
Competition judge	2009	Student Research Competition at CHI 2009.
Journal Reviewing	1993–	Communications of the ACM, Human-Computer Interaction Journal, IEEE Transactions on Visualization and Computer Graphics, ACM Transactions on Computer-Human Interaction, Ergonomics, Information and Software Technology, Information Technology and Society, Interacting with Computers, Virtual Reality, Personal and Ubiquitous Computing, Journal of Computer-Mediated Communication, and International Journal of Human-Computer Studies.
Misc.	2003	Organised the 'Masterclass and Symposium on Interacting with and Through Next Generation Computer Systems', held at the University of Canterbury.
Organising committees	1996, 1998	OzCHI
Doctoral consortium	2008	CHI 2008
Other reviewing	Ongoing	Graphics Interface 2009, 2010, 2011; UIST Demos 2009; ACM CHI 2007, 2006, 2005, 2004, 2003, 2002. AICCS-07; ACM UIST 2007, 2006, 2005, 2003; InfoVis 2006; BEyond time and errors: novel evaLuation methods for Information Visualization (BELIV'06); ACM Advanced Visual Interfaces (AVI) 2006; IEEE Tencon'05; CHINZ'05; Interact'05; MobileHCI'05; ACM CSCW 2004; ACM UIST 2003; INTERACT 2003; Australasian User Interface Conference, 2000–2003; The Active Web, '99; ACM Conference on Data Communications 1994; ACM Conference on Human Factors in Computing Systems 1996; OZCHI'94-97; APCHI'96 & '98; ACM Hypertext '97; Graphics Interface '97; InterAct '97; ACM Group '97.

Invited seminar presentations outside the University of Canterbury

Keynote address, ACM Interactive Surfaces and Spaces Conference, Wellington, NZ.	November, 2022.
Keynote address, INTERACT Conference, Mumbai.	September, 2017.
Dean's Colloquium, ANU, Australia.	August, 2016.
Engineering & Computer Science, ANU, Australia.	August, 2016.
Institute of Advanced Studies, University of Bristol, UK.	August, 2013.
Department of Computer Science, University of Glasgow, UK.	August, 2013.
Colloquium Polaris, INRIA, Lille, France.	July, 2013.
Department of Computer Science, University of Manitoba, Canada.	August, 2010.
Department of Computer Science, University of Manitoba, Canada.	August, 2010.
Department of Computer Science, University of British Columbia, Canada.	August, 2010.
Keynote address, Australasian Computer Science Week.	January, 2010.
Department of Computer Science, University of British Columbia, Canada.	July, 2009.
Department of Computer Science, University of Calgary, Canada.	July, 2008.
Department of Computer Science, Swansea University, UK.	September, 2008.
INRIA, Universite Paris-Sud, France.	September, 2006.
Department of Computer Science, Swansea University, UK.	August, 2006.
Logitech Inc., California.	July, 2006.
Department of Computer Science, Dalhousie University, Nova Scotia.	July, 2006.
Digital Graphics Project Lab, University of Toronto.	June, 2006.
Department of Computer Science, University of Saskatoon.	June, 2006.
Department of Computer Science, University of Calgary.	April, 2006.
IBM Almaden Research Centre.	March, 2006.
Digital Fusion Inc..	February, 2006.
Usability Professionals Association (UPA), Canterbury Innovation Incubator.	November, 2005.
Usability Professionals Association (UPA), Canterbury Innovation Incubator.	November, 2004.
Department of Computer Science, University of Calgary, Canada.	November, 2003.
Human-Computer Interaction Lab, Univ. of Maryland, College Park, USA.	October 2003.
Department of Computer Science, University of Glasgow.	September, 2003.
Department of Psychology, University of York.	September, 2003.
Interaction Centre, University College London.	September, 2003.
Department of Computer Science, University of Southampton.	September, 2003.
New Zealand Computer Society, Christchurch.	June, 2003.
Department of Computer Science, University of Waikato.	December, 2002.
Allied Telesyn Research.	November, 2002.
Department of Computer Science, University of Calgary, Canada.	October, 2001.
Institute for Info. Tech., National Research Center, Ottawa, Canada.	October, 2001.
Grouplab, University of Calgary, Canada.	October, 2001.
Department of Computer Science, University of Saskatchewan, Canada.	October, 2001.
Department of Computer Science, University of Cape Town, South Africa.	September, 2001.
Department of Computer Science, Victoria University of Wellington.	July, 2000.
Inaugural ACM SIGCHI.NZ meeting. Massey University.	June 2000.
Department of Computer Science, University of Waikato.	May, 2000.
Department of Computer Science, University of Calgary.	March, 1999.
Center for LifeLong Learning and Design, University of Colorado, Boulder.	November, 1998.
Norsk Regencentral (Norwegian Research Centre), Oslo, Norway.	August, 1998.
Department of Computer Science, University of Calgary.	January, 1996.
Department of Computer Science, Massey University.	January, 1993.
Department of Computer Science, University of Waikato.	January, 1993.

Visiting academics

I have attracted many world leaders in Human-Computer Interaction to the department. Most of them have presented several seminars while at Canterbury, including numerous ‘Science Prestige Lectures’ and Ben Sheiderman’s Royal Society Evening Lecture.

Prof. Joanna McGrenere	University of British Columbia, Vancouver, Canada.	One month, 2023.
Prof. Carl Gutwin	University of Saskatchewan, Saskatoon, Canada.	Two months, 2023.
Dr. Philip Quinn	Google Research, Mountain View, California.	One year, 2020-2021.
Prof. Carl Gutwin	University of Saskatchewan, Saskatoon, Canada.	Four weeks, 2020.
Prof. Carl Gutwin	University of Saskatchewan, Saskatoon, Canada.	Seven weeks, 2015-2016.
Prof. Wolfgang Stuerzlinger	University of Waterloo, Canada	Three months, 2011-2012
Prof. Kari-Jouko Raiha	University of Tampere, Finland	Nine months, 2009-2010
Dr. Saira Ovaska	University of Tampere, Finland	Nine months, 2009-2010
Dr. David Ahlstrom	Klagenfurt University, Austria.	Eighteen months, 2008-2010.
Prof. Carl Gutwin	University of Saskatchewan, Saskatoon, Canada.	Three months, 2008.
Prof. Karon MacLean	University of British Columbia, Canada.	Six months, 2007-2008.
Prof. Bob Kraut	Carnegie Mellon University.	Erskine Visitor. Three months, 2008.
Prof. Andrew Monk	University of York, UK.	Three months, 2008.
Dr. Gonzalo Ramos	University of Toronto, Canada.	One month, 2007.
Prof. Carl Gutwin	University of Saskatchewan, Saskatoon, Canada.	Erskine Fellow. Four months, 2007.
Prof. Alistair Sutcliffe	University of Manchester, UK.	One month, 2007.
Prof. Carl Gutwin	University of Saskatchewan, Saskatoon, Canada.	One week, 2005.
Prof. Ben Bederson	University of Maryland, Maryland, USA.	One week, 2004.
Prof. Ben Shneiderman	University of Maryland, Maryland, USA.	Erskine Fellow. One month, 2003.
Prof. Jenny Preece	University of Maryland, Baltimore County, Maryland.	Erskine Fellow. One month, 2003.
Prof. Stephen Brewster	University of Glasgow, UK.	Erskine Fellow. Six months, 2003.
Prof. Gerhard Fischer	University of Colorado, Boulder.	One year, 2002–2003.
Prof. Bob Spence	Imperial College London.	Erskine Fellow. One month, 2002.
Prof. Gerhard Fischer	University of Colorado, Boulder.	Erskine Fellow. One month, 2000.
Prof. Harold Thimbleby	Middlesex University, UK.	Erskine Fellow. One month, 1997.
Dr Allen Cypher	Apple Research, Cupertino, California.	One week, 1996.
Dr Akihiko Machizawa	Communications Research Laboratory, Japan.	Three years, 1996–1998.
Professor Brian Wyvill	University of Calgary, Canada.	Erskine Fellow. Two months, 1996.
Professor Saul Greenberg	University of Calgary, Canada.	Erskine Fellow. Six months, 1995.
Carl Gutwin	University of Calgary, Canada.	Two months, 1995.
Dr Steve Jones	University of Abertay, Dundee.	Six months, 1995.

Expert Witness Consulting

Role	Expert witness for SBM Legal, counsel for New Zealand Te Whatu Ora Waitemata. (analysis, reports).
Case	Vinod Chand v Health New Zealand Te Whatu Ora Waitemata. <i>Employment relations authority (regarding text auto-correct functionality).</i>
Dates	May 2024 – June 2024.
Role	Expert witness for Fish & Richardson, counsel for Apple. (analysis, reports).
Case	Smith Interface Technologies v. Apple. <i>Patent Trial and Appeal Board.</i>
Dates	December 2023 –
Role	Expert witness for Finnegan, Henderson, Farabow, Garrett & Dunner, counsel for Samsung.
Role	Expert witness for Fish & Richardson, counsel for Apple. (analysis, reports, deposition).
Case	Masimo v. Apple. <i>Patent Trial and Appeal Board. IPR2023-00664, IPR2024-00290</i>
Dates	July 2023 –
Role	Expert witness for Finnegan, Henderson, Farabow, Garrett & Dunner, counsel for Samsung. (analysis).
Case	Smith Interface Technologies v. Samsung. <i>Eastern District of Texas. 2:22-cv-00290-JRG</i>
Dates	November 2022 – June 2023.
Role	Expert witness for Morrison Foerster, counsel for Apple. (analysis, reports, deposition).
Case	Firstface Co. Ltd. v. Apple Inc. <i>Northern District of California. 3:18-cv-02245-JD.</i>
Dates	June 2022 – March 2024.
Role	Expert witness for Finnegan, Henderson, Farabow, Garrett & Dunner, counsel for Samsung. (analysis).
Case	Village Green Technologies v. Samsung. <i>Eastern District of Texas. 2:21-cv-00323-JRG-RSP</i>
Dates	January 2022 – March 2022.
Role	Expert witness for Desmarais, counsel for IBM. (analysis, reports, deposition).
Case	Chewy, Inc. v. IBM. <i>Southern District of New York. 1:21-cv-01319-JSR.</i>
Dates	August 2021 – Jan 2023.
Role	Expert witness for Farella, Braun & Martel, counsel for Google. (analysis, reports, testimony at trial).
Case	Profectus Technology versus Google. <i>Western District of Texas. 6:20-cv-101-ADA.</i>
Dates	March 2021 – October 2021.
Role	Expert witness for Latham & Watkins and Allen & Overy, counsel for Facebook/Instagram/WhatsApp/Meta. (analysis, reports, deposition).
Case	Facebook/Meta Platforms <i>et al.</i> versus Wrinkl <i>Patent Trial and Appeal Board. IPR2021-00882, -00883</i>
Dates	February 2021 – November 2022.

Role	Expert witness for Morrison & Foerster, counsel for Renesas. (analysis).
Case	Neodron versus Renesas Electronics Corp. <i>Western District of Texas</i> . 6:20-CV-00529.
Dates	December 2020 – August 2021.
Role	Expert witness for DLA Piper, counsel for Samsung. (analysis, declaration).
Case	Neonode versus Samsung. <i>Western District of Texas</i> . 6:20-CV-00507.
Dates	September 2020 – July 2023.
Role	Expert witness for DLA Piper (counsel for Apple, Microsoft and ASUS), Morrison & Foerster (counsel for Amazon), Finnegan, Henderson, Farabow, Garrett & Dunner (counsel for LG), O'Melveny & Myers (counsel for Samsung), Vasquez Benisek & Lindgren (counsel for ASUS). (analysis).
Case	Neodron versus Apple, Microsoft, Amazon & others. <i>US International Trade Commission</i> . 337-TA-1193.
Dates	May 2020 – November 2020.
Role	Expert witness for Desmarais, counsel for IBM. (analysis, reports).
Case	IBM versus Zillow Group. <i>Central District of California</i> . 8:19-CV-01777.
Dates	October 2019 – May 2020.
Role	Expert witness for DLA Piper (counsel for Microsoft, HP, Lenovo), Morrison & Foerster (counsel for Amazon), Finnegan, Henderson, Farabow, Garrett & Dunner (counsel for Motorola and Lenovo), Alston & Bird (counsel for Dell), O'Melveny & Myers (counsel for Samsung). (analysis, reports, deposition).
Case	Neodron versus Microsoft, HP, Amazon, Samsung, Dell, Motorola, Lenovo. <i>US International Trade Commission</i> . 337-TA-1162.
Dates	August 2019 – December 2020.
Role	Expert witness for Jones Day, counsel for Google and Huawei. (analysis).
Case	American Patents versus Huawei.
Dates	April 2019 – July 2019
Role	Expert witness for Gilbert+Tobin, counsel for Aristocrat Technologies. (reports, testimony at trial).
Case	Aristocrat Technologies versus Commissioner of Patents. <i>Federal Court of Australia</i> . NSD 1343/2018.
Dates	September 2018 – June 2020
Role	Expert witness for Williams & Connolly and Alston & Bird, counsel for Google and ASUS Inc. (reports, deposition).
Case	Koninklijke Philips versus ASUS. <i>Northern District of California</i> 4:18-cv-01885-HSG.
Dates	March 2016 – March 2020
Role	Expert witness for Williams and Connolly, counsel for Google Inc. (reports, deposition).
Case	Google versus Philips. <i>Patent Trial and Appeal Board</i> . IPR2017-00386/387/388/389.
Dates	March 2016 – March 2020

Role	Expert witness for DLA Piper, counsel for Apple Inc. (reports, deposition, testimony at trial).
Case	Immersion versus Apple. <i>US International Trade Commission</i> . 337-TA-1004 and 337-TA-990 (consolidated).
Dates	June 2016 – May 2017
Role	Expert witness for DLA Piper, counsel for Apple Inc. (reports).
Case	Apple versus Immersion. <i>Patent Trial and Appeal Board</i> . IPR2016-01777.
Dates	June 2016 – May 2017
Role	Expert witness for Wilmer Cutler Pickering Hale and Dorr, counsel for Apple Inc. (analysis).
Case	Core Wireless Licensing S.a.r.l. v. Apple Inc. <i>Eastern District of Texas</i> . 6:14-cv-00751 and 6:14-cv-00752.
Dates	August 2015 – June 2016
Role	Expert witness for Weil, Gotshal & Manges, counsel for Apple Inc. (analysis).
Case	Motorola Mobility Inc. versus Apple Inc. <i>Southern District of Florida</i> . 10-CV-23580-RNS-TEB and 12-CV-20271-RNS-TEB.
Dates	October 2013 – March 2014
Role	Expert witness for Gibson, Dunn & Crutcher, counsel for Apple Inc. (reports, deposition, testimony at trial).
Case	Apple Inc. versus Samsung Electronics Co. Ltd. <i>Northern District of California</i> . 12-CV-0630-LHK.
Dates	June 2013 – June 2014
Role	Expert witness for Herbert Smith Freehills, counsel for Apple Inc. (reports, testimony at trial).
Case	Apple Inc. versus Samsung Electronics Co. Ltd. <i>Federal Court of Australia</i> . NSD 1243 of 2011.
Dates	September 2011 – May 2013

Other

- Member of the Association of Computing Machinery (ACM).
- Member of the ACM Special Interest Group of Computer-Human Interaction.