

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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SAMSUNG ELECTRONICS CO. LTD., SAMSUNG ELECTRONICS

AMERICA, INC. AND APPLE, INC.,

Petitioners

v.

NEONODE SMARTPHONE LLC,

Patent Owner

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Case IPR2021-00145

U.S. Patent No. 8,812,993

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**DECLARATION OF CRAIG ROSENBERG, Ph.D.**

## TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION .....	1
II. QUALIFICATIONS .....	1
III. TESTIFYING EXPERIENCE.....	8
IV. INFORMATION CONSIDERED.....	10
V. RELEVANT LEGAL STANDARDS .....	10
A. Claim Interpretation .....	10
B. Perspective of one of Ordinary Skill in the Art .....	11
C. Anticipation .....	11
D. Obviousness.....	12
E. Summary of my Opinions .....	14
VI. THE ‘993 PATENT.....	15
A. Priority Date. ....	15
B. Level of Skill Ordinary in the Art. ....	15
VII. CLAIM CONSTRUCTION .....	16
A. “An Electronic Device” (Claim 1, Preamble).....	16
B. “Tap-Activatable” (Claim 1, Limitation 1[b]) .....	19
C. “System Function(s)” (Claim 1, Limitation 1[b]).....	21
VIII. EXPLANATION OF PATENTABILITY .....	23
A. Ground 1A: Claims 1-3, 7 and 8 .....	24
1. Claim 1 .....	24

a.	Hisatomi Does Not disclose Tap-Activatable Icons or a Tap-Present State (Limitation 1[b]).....	24
b.	A POSA Would Not have been Motivated to Incorporate the $a \rightarrow c \rightarrow a$ Variant of Ren's Direct Off Strategy into Hisatomi (Limitation 1[b]).....	37
c.	Hisatomi does Not Disclose Icons for a Plurality of System Functions (Limitation 1[b]) .....	50
2.	Claim 3 .....	53
3.	Claims 2, 7-8 .....	57
B.	Ground 1B: Claim 4 .....	57
1.	Allard-656 is Not in the Same Field of Endeavor as the '993 Patent, and is Not Reasonably Pertinent to the Problem the Inventor Sought to Solve.....	57
2.	A POSA Would Not have been Motivated to Combine Allard-656 with Hisatomi .....	62
C.	Ground 1C: Claim 5 .....	65
D.	Ground 1D: Claim 6 .....	67
E.	Ground 2A: Claims 1-3, 7 and 8 .....	69
1.	Claim 1 .....	69
a.	Hansen Does Not Disclose an "Electronic Device" as Recited in the Preamble (Limitation 1[pre]).....	69
b.	Hansen does Not Disclose Icons for a Plurality of System Functions (Limitation 1[b]) .....	72
c.	Hansen Does Not Disclose a Tap-Absent State (Limitation 1[c]) .....	73

d.	A POSA Would Not have been Motivated to Incorporate an “Otherwise Activatable Graphic” Into Hansen’s Display (Limitation 1[c]).....	75
2.	Claim 3 .....	78
3.	Claims 2, 7-8 .....	80
F.	Ground 2B: Claim 4 .....	80
G.	Ground 2C: Claim 5 .....	82
H.	Ground 2D: Claim 6 .....	83

I, Craig Rosenberg, Ph.D., declare as follows:

## **I. INTRODUCTION**

1. I have been retained by Neonode Smartphone LLC (“Respondent”) as an independent expert consultant in this *inter partes* review (“IPR”) proceeding before the United States Patent and Trademark Office (“PTO”).

2. I have been asked by Respondent’s counsel (“Counsel”) to consider whether certain references render Claims 1-8 of U.S. Patent No. 8,812,993 (“the ‘993 Patent” (EX1001)) unpatentable under 35 U.S.C. § 103, for the reasons set forth in the Petition for Inter Partes Review of United States Patent No. 8,095,879 Pursuant to 35 U.S.C. §§311-319, 37 C.F.R. §4 (“Petition”) and the accompanying Declaration of Dr. Benjamin B. Bederson (“Bederson Declaration”). My opinions and the bases for my opinions are set forth below.

3. I am being compensated at my ordinary and customary consulting rate for my work, which is \$450 per hour. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this or any other proceeding. I have no financial interest in this proceeding.

## **II. QUALIFICATIONS**

4. All of my opinions stated in this declaration are based on my own personal knowledge and professional judgment. In forming my opinions, I have

relied on my knowledge and experience in human factors, user interface design, user interaction design, human-computer interaction, and software engineering.

5. I am over 18 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth herein. My qualifications to testify about the '993 Patent and the relevant technology are set forth in my curriculum vitae ("CV"), which I have included as EX2002. In addition, a brief summary of my qualifications is included below,

6. I hold a Bachelor of Science in Industrial Engineering, a Master of Science in Human Factors, and a Ph.D. in Human Factors from the University of Washington School of Engineering. For 30 years, I have worked in the areas of human factors, user interface design, software development, software architecture, systems engineering, and modeling and simulation across a wide variety of application areas, including aerospace, communications, entertainment, and healthcare.

7. I graduated from the University of Washington in 1988 with a B.S. in Industrial Engineering. After graduation, I continued my studies at the University of Washington. In 1990, I obtained an M.S. in Human Factors. In 1994, I graduated with a Ph.D. in Human Factors. In the course of my doctoral studies, I worked as an Associate Assistant Human Factors Professor at the University of Washington Industrial Engineering Department. My duties included teaching,

writing research proposals, designing and conducting funded human factors experiments for the National Science Foundation, as well as hiring and supervising students. While studying at the University of Washington, I also worked as a human factors researcher and designed and performed advanced human factors experiments relating to virtual environments and interface design, stereoscopic displays, and advanced visualization research, which was funded by the National Science Foundation. My duties included user interface design, systems design, software development, graphics programming, experimental design, as well as hardware and software interfacing.

8. I have published twenty-one research papers in professional journals and proceedings in the areas of user interface design, computer graphics, and the design of spatial, stereographic, and auditory displays. I also authored a book chapter on augmented reality displays in the book “*Virtual Environments and Advanced Interface Design*” (Oxford University Press, 1995). In addition, I created one of the first virtual spatial musical instruments called the MIDIBIRD that utilized the MIDI protocol, two six-dimensional spatial trackers, a music synthesizer, and a computer graphics workstation to create an advanced and novel musical instrument.

9. For the past 21 years, I have served as a consultant for Global Technica, Sunny Day Software, Stanley Associates, Techrizon, CDI Corporation,

and the Barr Group. In this capacity, I have provided advanced engineering services for many companies.

10. I consulted for the Boeing Company for over 16 years as a senior human factors engineer, user interface designer, and software architect for a wide range of advanced commercial and military programs. Many of the projects that I have been involved with include advanced software development, user interface design, agent-based software, and modeling and simulations in the areas of missile defense, homeland security, battle command management, computer aided design, networking and communications, air traffic control, location-based services, and Unmanned Aerial Vehicle (“UAV”) command and control. Additionally, I was the lead system architect developing advanced air traffic controller workstations and air traffic control analysis applications, toolsets, and trade study simulations for Boeing Air Traffic Management.

11. I was also the architect of the Boeing Human Agent Model. The Boeing Human Agent Model is an advanced model for the simulation of human sensory, cognitive, and motor performance as applied to the roles of air traffic controllers, pilots, and UAV operators. In another project, I was the lead human factors engineer and user interface designer for Boeing’s main vector and raster computer aided drafting and editing system that produces the maintenance manuals, shop floor illustrations, and service bulletins for aircraft produced by the



Boeing Commercial Aircraft Company. Additional responsibilities in my time as a consultant include system engineering, requirements analysis, functional specification, use case development, user stories, application prototyping, modeling and simulation, object-oriented software architecture, graphical user interface analysis and design, as well as UML, C++, C#, and Java software development.

12. In 1995 and 1996, I was hired as the lead human factors engineer and user interface designer for the first two-way pager produced by AT&T. Prior to this technology, people could receive pages but had no way to respond utilizing their pager. This new technology allowed users to use a small handheld device to receive and send canned or custom text messages, access and update an address book, and access and update a personal calendar. This high-profile project involved designing the entire feature set, user interface/user interaction design and specification, as well as all graphical design and graphical design standards.

13. From 1999–2001, I was the lead human factors engineer and user interface designer for a company called Eyematic Interfaces that was responsible for all user interface design and development activities associated with real-time mobile handheld 3D facial tracking, animation, avatar creation and editing software for a product for Mattel. My work involved user interface design, human factors analysis, requirements gathering and analysis, and functional specifications.

14. In 2001, I was the lead user interface designer for a company called Ahaza that was building IPv6 routers. I designed the user interfaces for the configuration and control of these advanced network hardware devices. My responsibilities included requirements analysis, functional specification, user interface design, user experience design, and human factors analysis.

15. In 2006-07, I was the lead user interface designer for a company called ObjectSpeed that developed a portable handheld telephone for use in homes and businesses that had many of the same capabilities that we take for granted in mobile cellular phones. This portable multifunction device supported voice, email, chat, video conferencing, internet radio, streaming media, Microsoft Outlook integration, photo taking and sharing, etc. The ObjectSpeed device was specifically designed and developed as a portable handheld device.

16. I am the founder, inventor, user interface designer, and software architect of WhereWuz. WhereWuz is a company that produces advanced mobile software running on GPS-enabled smartphones and handheld devices. WhereWuz allows users to record exactly where they have been and query this data in unique ways for subsequent retrieval based on time or location. WhereWuz was specifically designed and developed to run on small handheld devices.

17. I am the co-founder of a medical technology company called Healium. Healium developed advanced wearable and handheld user interface

technology to allow physicians to more effectively interact with electronic medical records.

18. I am the co-founder of a medical technology company called StratoScientific. StratoScientific is developing an innovative case for a smartphone that turns a standard handheld smartphone into a full featured digital stethoscope that incorporates visualization and machine learning that can be utilized for telemedicine and automated diagnosis.

19. In 2012-13, I designed and developed a large software project for Disney World called xVR that allowed the operational employees of Disney World to utilize a handheld device to view the current and historical status of all of the guests of Disney World within multiple attractions as well as within one of their restaurants. The application could run in a real-time/live mode where it would display data collected from sensors that showed the location and status of all guests within the attraction; the application could also be run in a fast-time/simulated mode. The application was developed on a laptop computer and was specifically designed to run on a variety of devices, including laptops, PCs, smartphones, and tablets.

20. I have received several awards for my engineering work relating to interface design, computer graphics, and the design of spatial, stereographic, and auditory displays, including a \$10,000 scholarship from the I/ITSEC for advancing

the field of interactive computer graphics for flight simulation and a Link Foundation award for furthering the field of flight simulation and virtual interface design. I have also created graphics for several popular book covers as well as animations for a movie produced by MIRAMAR.

### III. TESTIFYING EXPERIENCE

- *Foursquare Labs v. Silver State Intellectual Technologies*, IPR2014-00159
- *Silver State Intellectual Technologies v. Garmin*, District of Nevada, 2:11-cv-01578-PMP-PAL
- *Select Retrieval v. Overstock*, District of Delaware, 1:11-cv-00812-RGA
- *Location Labs v. LocatioNet*, IPR2014-00199
- *Intellectual Ventures v. Google*, IPR2014-00787
- *FTC v. Amazon*, 2:14-cv-01038-JCC (Eastern District of Texas)
- *Valmont v. Lindsay*, IPR2015-01039
- *Ford Class Action*, 13-cv-3072-EMC (N.D. California.)
- *BeUbiq v. Curtis Consulting Group*, 1-14-cv-270691 (S.D.N.Y.)
- *EduLog v. DML*, DV-06-1072 (Montana Fourth Judicial Court, Missoula)
- *GEMSA v. Alibaba*, 6:16-cv-00098 (M.D. Florida)
- *Level One Technologies v. Penske Truck Leasing*, 4:14-cv-1305-RWS (E.D. Missouri)
- *Title Source v. HouseCanary*, 016-CI-06300 (Texas Dist. (state court), Bexar Co.)
- *Sony v. Arris, Pace*, 337-TA-1049 (International Trade Commission case)

- *Tatsoft v. InduSoft*, D-1-GN-14-001853 (Texas state court case)
- *Courthouse News Service v. Yamasaki*, 8:17-cv-00126 AG (KESx) (C.D. Cal.)
- *Princeton Digital Image Corp. v. Konami*, 12-1461-LPS-CJB (D. Del)
- *FCA US LLC Monostable Electronic Gearshift Litigation*, 16-md-02744 (E.D. Michigan)
- *Barbaro Technologies, LLC v. Niantic, Inc.*, 3:18-cv-02955-RS (N.D. California)
- *Blackberry Limited. v. Facebook, Inc.*, 2:18-cv-01844 (C.D. California)
- *Blackberry Limited. v. Snap, Inc.*, 2:18-cv-02693 (C.D. California)
- *Saracen LLC v. Marginal Unit, Inc.*, 4:18-cv-3714 (S.D. Texas)
- *Fidelity Information Services, LLC v. Groove Digital, Inc.*, IPR2019-00050
- *U.S. Oil & Refining Co., v. City of Tacoma*, 18-2-07232-3 (Superior Court of Washington)
- *X One v. Uber*, 5:16-CV-06050-LHK (N.D. California, San Jose Div.)
- *Kipu Systems, LLC v. ZenCharts, LLC*, 1:17-cv-24733-KMW-EGT (S.D. Florida)
- *Maxell, LTD., v. Apple Inc.*, 5:19-cv-0036-RWS (E.D. Texas)
- *Aatrix Software, Inc. v. Green Shades Software, Inc.*, 3:15-cv-00164-J-IOMCR (M.D. Florida)
- *Universal Electronics Inc. v. Roku, Inc.*, 337-TA-1200 (I.T.C)
- *Opal Labs, Inc., v. Sprinklr, Inc.*, 3:18-cv-01192-HZ (Dist. of Oregon, Portland Div.)
- *ExactLogix, Inc. d/b/a AccuLynx.com, v. JobProgress, LLC.*, 3:18-cv-50213 (Northern Dist. of Illinois, Western Div.)

#### **IV. INFORMATION CONSIDERED**

21. In preparing this declaration, I have considered the materials discussed in this declaration, including, for example, the '993 Patent, the references cited by the '993 Patent, the prosecution histories of the '993 Patent and applications derived therefrom (including the references cited therein), various background articles and materials referenced in this declaration, the Petition for Inter Partes Review, the Declaration of Benjamin B. Bederson, Ph.D., and the exhibits identified in this declaration. And my opinions are further based on my education, training, experience, and knowledge in the relevant field.

22. In addition, I have considered the exhibits filed concurrently with my declaration in support of Patent Owner's Preliminary Response, as well as the exhibits filed concurrently with this declaration in support of Patent Owner's Response.

#### **V. RELEVANT LEGAL STANDARDS**

23. I am not an attorney and offer no legal opinions. For the purposes of this Declaration, I have been informed about certain aspects of the law that are relevant to my analysis, as summarized below.

##### **A. Claim Interpretation**

24. I have been informed and understand that in an IPR proceeding, claims are to be interpreted according to the *Phillips* claim construction

methodology, which, generally speaking, requires that claims be given their ordinary and customary meaning to a person of ordinary skill in the art at the time of the invention, by considering the claims, the specification and the prosecution history, as well as evidence extrinsic to the patent. *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005). I have been informed and understand that claim construction is a matter of law and that the final claim constructions for this proceeding will be determined by the Patent Trial and Appeal Board (“PTAB”).

**B. Perspective of one of Ordinary Skill in the Art**

25. I have been informed and understand that a patent is to be understood from the perspective of a hypothetical “person of ordinary skill in the art” (“POSA”). Such an individual is considered to possess normal skills and knowledge in a particular technical field (as opposed to being a genius). I understand that in considering what the claims of a patent require, what was known prior to that patent (prior art), what a prior art reference discloses, and whether an invention is obvious or not, one must use the perspective of such a POSA.

**C. Anticipation**

26. I have been informed and understand that a patent claim is anticipated under 35 U.S.C. § 102, and is therefore invalid, if all of the elements of the claim are disclosed by a single prior art reference. I understand that a claim is anticipated if each and every element as set forth in the claim is found, either

expressly or inherently, in a single prior art reference. For example, I understand that a claim limitation is inherently disclosed if it is not explicitly present in the written description of the prior art, but would necessarily be embodied or met by an apparatus or method as taught by the prior art. Moreover, I understand that anticipation does not require that the prior art use the same terminology recited within the patent claims.

**D. Obviousness**

27. I have been informed and understand that a patent claim is obvious under 35 U.S.C. § 103, and is therefore invalid, if the claimed subject matter, as a whole, would have been obvious to a POSA as of the date of the invention claimed in the patent based on one or more prior art references and/or the knowledge of a POSA.

28. I understand that an obviousness analysis must consider (1) the scope and content of the prior art, (2) the differences between the claims and the prior art, (3) the level of ordinary skill in the pertinent art, and (4) secondary considerations, if any, of non-obviousness (such as unexpected results, commercial success, long felt but unmet need, failure of others, copying by others, and skepticism of experts).

29. I understand that a prior art reference may be combined with other references to disclose each element of the invention under 35 U.S.C. § 103. I understand that a reference may also be combined with the knowledge of a POSA,



and that this knowledge may be used to combine multiple references. I further understand that a POSA is presumed to know the relevant prior art. I understand that the obviousness analysis may take into account the inferences and creative steps that a POSA would employ.

30. In determining whether a prior art reference would have been combined with other prior art or other information known to a POSA, I understand that the following principles may be considered:

- a. whether the references to be combined involve non-analogous art;
- b. whether the references to be combined are in different fields of endeavor than the alleged invention in the Patent;
- c. whether the references to be combined are reasonably pertinent to the problems to which the inventions of the Patent are directed;
- d. whether a POSA would have been motivated to combine the specified references, and would have had a reasonable expectation of success in doing so;
- e. whether a reference “teaches away” from a particular combination or solution;
- f. whether the combination requires modifications that render the prior art unsatisfactory for its intended use;
- g. whether the combination requires modifications that change the principle of operation of the reference;
- h. whether the combination is of familiar elements according to known methods that yields predictable results;
- i. whether a combination involves the substitution of one known element for another that yields predictable results;

- j. whether the combination involves the use of a known technique to improve similar items or methods in the same way that yields predictable results;
- k. whether the combination involves the application of a known technique to a prior art reference that is ready for improvement, to yield predictable results;
- l. whether the combination is “obvious to try;”
- m. whether the combination involves the known work in one field of endeavor prompting variations of it for use in either the same field or a different one based on design incentives or other market forces, where the variations are predictable to a POSA;
- n. whether there is some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill in the art to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention;
- o. whether the combination is reasonably expected to be a success; and
- p. whether the combination possesses the requisite degree of predictability at the time the invention was made.

31. I understand that in determining whether a combination of prior art references renders a claim obvious, it is helpful to consider whether there is some teaching, suggestion, or motivation to combine the references and a reasonable expectation of success in doing so. I understand, however, that a teaching, suggestion, or motivation to combine is not required.

#### **E. Summary of my Opinions**

32. I have been asked to consider whether the claims of the ‘993 Patent identified in the Petition are unpatentable for the reasons asserted in the Petition

and in Dr. Bederson's declaration. As explained below in detail in this declaration, it is my opinion that none of the claims of the '993 Patent identified in the Petition and in Dr. Bederson's declaration are unpatentable for the reasons asserted therein.

## **VI. THE '993 PATENT**

### **A. Priority Date.**

33. I assume that the priority date for the invention claimed in the '993 Patent is December 10, 2002. Accordingly, when I reference the knowledge of a POSA, or how a POSA would understand various disclosures, I do so as of December 10, 2002. If the priority date of the '993 Patent were to be determined to be an earlier date in 2002, or in 2000 or 2001, my opinions expressed herein would not change.

### **B. Level of Skill Ordinary in the Art.**

34. Dr. Bederson contends that "A POSA for the '993 Patent during the relevant time period would have had at least a bachelor's degree in computer science, computer engineering, or the equivalent education and at least two years of experience in user-interface design and development. Additional years of experience could substitute for formal education, and vice versa." For the purpose of this declaration, I will apply the same definition of the level of skill of a POSA.

35. Based on my experience, education, and training, I met the definition of a POSA in December 2002, the time of filing of the application that issued as

the '993 Patent, and I meet this definition today. I also had greater knowledge and experience than a POSA. I worked with POSAs in 2002, and I am able to render opinions from the perspective of a POSA based on my knowledge and experience. My opinions concerning the '993 Patent claims and the prior art are from the perspective of a POSA, as set forth above.

## VII. CLAIM CONSTRUCTION

36. I interpret the claims of the '993 Patent according to the *Phillips* claim construction methodology. *Phillips*, 415 F.3d 1303. I have reviewed the specification and file history of the '993 Patent from the point of view of a POSA, which informs my understanding of the scope of the claims.

### A. “An Electronic Device” (Claim 1, Preamble)

37. A POSA reading claim 1 in light of the specification, and applying the knowledge of a POSA, would conclude that “an electronic device” as that term is used in the preamble of claim 1 means “a mobile handheld computer.”

38. There are several reasons for this. I start with the language of claim 1. The preamble recites: “A non-transitory computer readable medium storing instructions, which, when executed by a processor of an electronic device having a touch-sensitive display screen, cause the processor to enable a user interface of the device, . . . .” EX1001, 6:50-53. A POSA would understand from this language that the device of the claim must include a processor and a touch-sensitive display

screen, and that the processor of the device must execute the instructions stored on the computer readable medium to enable a user interface presented on the touch-sensitive display. A POSA would understand that the “electronic device” includes a housing or hard enclosure, within which at least the processor and touch-sensitive display screen are disposed, because that is how devices with the recited structure and configuration were typically constructed in 2002. Such a structure would be understood by a POSA in 2002 to identify a mobile handheld computer, as there were few if any computer units with such structure known in the art in 2002 that were not handhelds.

39. Next, I review the specification, and find that it confirms my conclusion as to how a POSA would understand the claim language. First, the specification repeatedly refers to the invention of the ‘993 Patent as relating to a handheld computer unit. For example, the Technical Field of “[t]he present invention relates to a user interface for a mobile handheld computer unit” and to “an enclosure for a handheld computer unit...” EX1001, 1:14-15, 22-23. The specification identifies “mobile handheld computers” as the relevant background art, and specifies that PDAs, mobile phones, and laptop computers are all examples of “mobile handheld computers.” EX1001, 1:33-43. The description identifies the need to avoid having to make PDAs and mobile phones larger to provide a user-

friendly interface “that is suitable for small handheld computer units.” *Id.*, 1:44-53.

40. The specification identifies the Technical Problems solved as adapting a user interface “to handle a large amount of information and different kinds of traditional computer-related applications on a small handheld computer unit,” and providing “a simple way to make the most commonly used functions for navigation and management available in the environment of a small handheld computer unit.” EX1001, 1:50-2:4. And the Solution takes as its “starting point” [sic] “a user interface for a mobile handheld computer unit, which computer unit comprises a touch sensitive area....” *Id.*, 2:8-11.

41. In addition, the illustrations of the user interface for the invention are of “a user interface for a mobile handheld computer unit.” EX1001, 3:57-58. And the device is consistently described and illustrated, as in Figure 13, as a “mobile handheld computer unit.” EX1001, FIG. 13; see also EX1001, 6:11-13.

42. A “device” that comprises a typical desktop implementation circa 2002 — a desktop computer coupled to a monitor coupled to a touch-screen device, for example — would not correspond to the form factor that create the problem the ‘993 Patent solves. Only a mobile handheld computer would do so.

43. In light of the claim language and this description of the invention in the ‘993 Patent’s specification, and in light of the understanding that a POSA

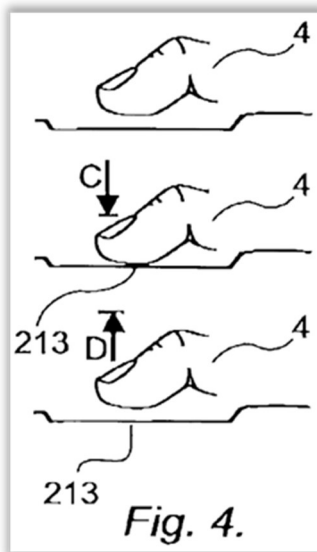
would bring, a POSA would understand “an electronic device” as that term is used in the preamble of claim 1 to mean “a mobile handheld computer.”

**B. “Tap-Activatable” (Claim 1, Limitation 1[b])**

44. A POSA reading claim 1 in light of the specification, and applying the knowledge of a POSA, would conclude that “tap-activatable” as that term is used in limitation 1[b] means “activatable upon completion of a gesture that involves the input device touching a screen followed directly and immediately by lifting off the screen.”

45. A POSA would have understood that a “tap” as used in a gesture-based user interface design for the touch-sensitive screen of a hand-operated computer unit, means a gesture in which the input device (1) touches the screen, and then (2) lifts directly and immediately off the screen. A POSA would have distinguished the “tap” gesture from a “drag and drop” gesture, in which the touch is maintained while making a gliding motion with the input device before the input device lifts off the screen. *Id.* And a POSA would have understood that a “tap” gesture as used in a gesture-based user interface for touch sensitive screens activates a function or service upon the input device lifting off of the screen. EX2001, ¶50. This property would have distinguished tap, in the mind of the POSA, from other known user interface gestures such as touch activation, in which processing is activated upon detecting the coordinates of the initial touch. *Id.*

46. The construction above reflects the understanding that a POSA would have had of the term “tap” in 2002, based on common knowledge or plain meaning. The ‘993 Patent’s specification is consistent with that understanding. The specification defines “tapping” as a gesture with at least two components: “FIG. 4 shows that selection of a preferred service or setting is done by tapping C, D on a corresponding icon 213.” EX1001, 4:41-42. Figure 4, which illustrates “tapping,” is reproduced below:



EX1001, FIG 4.

47. “Tapping” as described in the specification is a gesture consisting of a downward touch on the coordinates of the icon (C in Figure 4), followed directly and immediately by an upward lift off of the icon (D in Figure 4). *Id.*



48. A construction that omits the temporal aspect of a POSA's understanding of the term – that the liftoff must be immediate – would fail to distinguish “tapping” from other known user interface gestures such as drag and drop or long press. The tap gesture is distinguished from these other known gestures because touching the screen is followed directly and immediately by lifting off the screen.

**C. “System Function(s)” (Claim 1, Limitation 1[b])**

49. A POSA reading claim 1 in light of the specification, and applying the knowledge of a POSA, would conclude that “system function(s)” as that term is used in limitation 1[b] means “services or settings of the operating system.”

50. First, the term “system function(s)” as used in claim 1 would appear to a POSA to refer to some set of operating system functions.

51. A POSA would then look to the specification of the ‘993 Patent for further explanation. As a POSA would understand, the specification discloses at least two embodiments of the user interface as claimed. In one embodiment, if the first function 21 as shown in Figure 3 is activated, “then the display area 3 is adapted to display icons 211, 212, 213, 214, 215, 216 representing services or functions depending on the current active application.” EX1001, 4:20-23; 2:25-29. The specification gives an example of such an active application of the first embodiment, a photo editing application that “handles a picture,” where “the icons

that are shown when the first function is activated can be services such as ‘save to disk’, ‘send as SMS’, or ‘delete’ and they can be settings such as ‘resolution’, ‘colour’, or ‘brightness’.” EX1001, 4:31-35.

52. In the second embodiment, if the first function 21 as shown in Figure 3 is activated and “no application is currently active on the computer unit, then the icons 211, 212, 213, 214, 215, 216 are adapted to represent services or settings of the operations system of the computer unit, such as background picture, clock, alarm 215, users 213, help 211, etc.” EX1001, 4:36-40; 2:31-34.

53. A POSA would understand that the “system function(s)” of claim 1 refer to the second embodiment, describing “services or settings of the operations system of the computer unit,” for several reasons. First, the “operating system” language of the claim ties directly back to the “operations system” language of the second embodiment. Second, the structure of the claim requiring that the stored instructions cause a transition from a “tap-absent state” to a “tap-present state” appears to exclude the first embodiment. This is because a POSA would expect, in the ‘993 Patent embodiment, that the “current active application” of the first embodiment would likely include tap-activatable icons for interacting with the application, which would be contrary to claim 1’s recital of a transition from a tap-absent state to a tap-present state. Third, a POSA would find it informative that claim 4-6 depend from claim 1, and appear to tie in to some of the operations

system services and settings listed at 4:36-40. So, a POSA would understand that the “system function(s)” of claim 1 refer to “services or settings of the operating system.”

### **VIII. EXPLANATION OF PATENTABILITY**

54. This declaration focuses on the obviousness combinations that Petitioners assert for Claims 1-8 of the ‘993 Patent, and on the Declaration of Dr. Benjamin B. Bederson filed as Exhibit 1002 in support of the Petition. In this declaration, I principally address the assertions and opinions expressed by Dr. Bederson in his declaration, EX1002 submitted by Petitioners in support of the Petition. In doing so, it should be understood that I also address the arguments and statements made by Petitioners in the Petition that are based on or associated with the relevant portions of Dr. Bederson’s declaration.

55. In summary, I disagree with Dr. Bederson and Petitioners as to material aspects of their analysis, as well as their conclusions. I conclude, for the reasons stated below, that none of claims 1-8 of the ‘993 Patent are obvious in view of the arguments and references asserted by Petitioners and Dr. Bederson.

**A. Ground 1A: Claims 1-3, 7 and 8**

**1. Claim 1**

**a. Hisatomi Does Not disclose Tap-Activatable Icons or a Tap-Present State (Limitation 1[b])**

56. Claim 1 recites: “a tap-present state, wherein a plurality of tap-activatable icons for a respective plurality of pre-designated system functions are present, each system function being activated in response to a tap on its respective icon.” Dr. Bederson cites Hisatomi’s menu display as the “tap-present state” and cites the GUI function buttons shown on each menu as the “plurality of tap-activatable icons.” EX1002, ¶127-132. I disagree with Dr. Bederson; Hisatomi does not disclose either a “tap-present state” or “tap-activatable icons.”

57. Hisatomi discloses pull-out menus called “function lists” for the “image display” of an “information processing device.” EX1005, ¶0007-9. Hisatomi addresses the problem where, when a main image is displayed on a “portable information terminal with a narrow display screen,” the pull-out menu will cover the main image. EX1005, ¶0004. If the menu is made smaller, it will be difficult to read, but if a large menu is displayed more of the main image is covered. *Id.* And the more “function items” on the menu, the more these problems increase. *Id.* Hisatomi’s purpose is to provide function list pull-out menus that do not hinder any editing work on an image where both are simultaneously displayed on a small image display. EX1005, ¶0005.

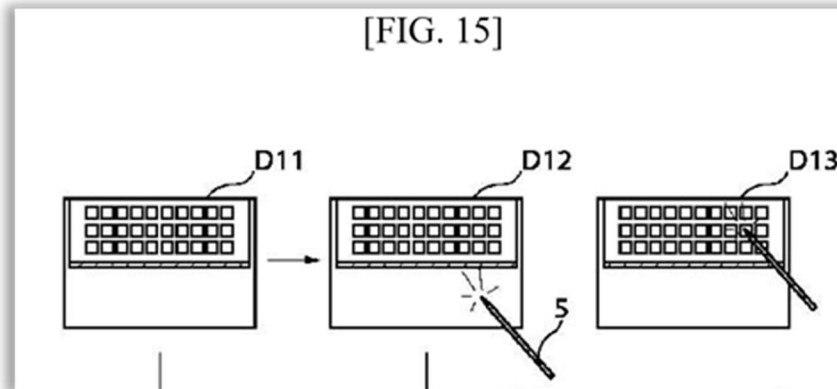
58. The information processing device could be a personal digital assistant (PDA) or notebook computer (EX1005, ¶¶0012; 0243), a still camera, video camera, head mounted display, car navigation system (EX1005, ¶0243), or a computer workstation (EX1005, ¶0244). The image display may be that of either a portable device or a full sized display. EX1005, ¶0242. The image display screen has a “touch panel sensor.” EX1005, ¶¶0015, 0017, FIG 5.

59. Hisatomi’s information processing device requires a “coordinate designation means for designating a coordinate position on the screen.” EX1005, ¶0007. The coordinate designation means is a “pen-type input device” with a portable-sized display (EX1005, ¶0012, FIG 4 input device 05). When “the touch panel sensor 11 on the image display screen 09 is touched by the pen-type input device 05, the coordinate is designated by this touch, and various functions can be selected.” EX1005, ¶0015.

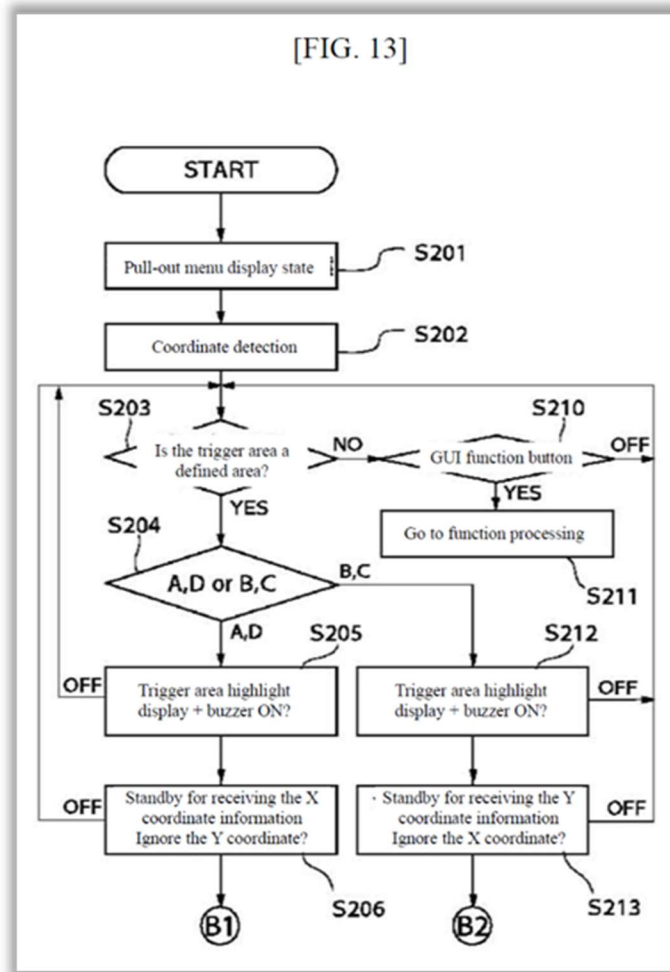
60. In Hisatomi, the touch panel sensor has a central image display area. EX1005, FIG 5. It is bordered by “the pullout menu display trigger areas 11A to 11D.” EX1005, ¶0018. “[W]hen it is determined that the coordinate information generated by the input device 05 exists in the pull-out menu display trigger areas,” the program goes into a standby mode, and “when it is detected that the input device 05 was scrolled toward the center of the touch panel sensor 11, the pull-out menu will be displayed.” *Id.*, Figs. 12, 15. This gesture is commonly known as a

“drag” gesture, in which the desired pull-out menu to be displayed is selected by a touch of the input device in the desired pullout menu display trigger area followed continuously by dragging the input device tip towards the center of the display. *Id.*, ¶0039, Figs. 10, 11, 13.

61. The content of the displayed pull-out menu is “a list of buttons based on icons or text display,” or “icons and characters [] written together.” EX1005, ¶0021, *e.g.*, FIG 7. Hisatomi explains that “[t]he touch panel sensor 11 on the image display screen 09 is touched by the pen-type input device 05, the coordinate is designated by this touch, and various functions can be selected.” *Id.*, ¶0015. Hisatomi details the processing of GUI function button selection with reference to FIG 15, reproduced in pertinent part below:



EX1005, FIG 15. And the processing steps are illustrated in Figure 13, reproduced below:



EX1005, FIG 13.

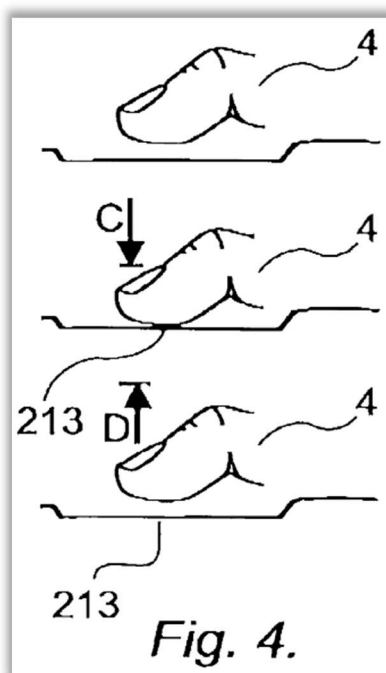
62. On Image D11 of FIG 15, the pull-out menu has been displayed, with the corresponding processing step shown as S201 on FIG 13. In the next step, “S202, the position coordinate on the touch panel sensor 11 touched by the input device 05 will be detected.” EX1005, ¶0054; FIG 13. Hisatomi determines next whether “the coordinate value detected in step S201 is included in any of the pull-out menu display trigger areas 11A to 11D.” *Id.*, ¶0055; FIG 13. If the coordinate value detected at S202 is not in the pull-out menu display trigger area as shown in

Image D13 of FIG 15, the processing determines whether the coordinates of the touch detected at step S202 is included in a GUI function button (“whether or not the specific function button (GUI function button) in the pull-out menu was selected by the input device 05 (S210)”). *Id.* “[I]f it is selected, the selected function will be processed (S211).” *Id.*

63. Hisatomi defines the term “OFF” to mean “that the touch panel sensor 11 will no longer be in contact with the input device 05 and the coordinate will no longer be detected.” EX1005, ¶0039. Figure 13 shows that if an “OFF” event occurs in the process of determining whether the coordinate value of the touch is in a menu pull-out target area or a GUI function button, the processing loops back to step S203—determining the location of the coordinate value of the touch. *Id.*, FIG 13.

64. A POSA at the time of the invention would have understood Hisatomi to teach that the processing associated with a GUI function button is activated (FIG 13, step S210-211), when the detected coordinate value of the input device’s *touch* correspond to the coordinate value of a GUI function button stored in memory. At the time of the invention, a POSA would have distinguished the touch-activated GUI function icon or button selection process of Hisatomi from the tap-activated icons taught in the ‘993 Patent. EX1001, 2:35-36; 2:66-3:2; 4:41-42; FIG 4. The ‘993 Patent discloses tap-activation in at least Figure 4:





EX1001, FIG 4.

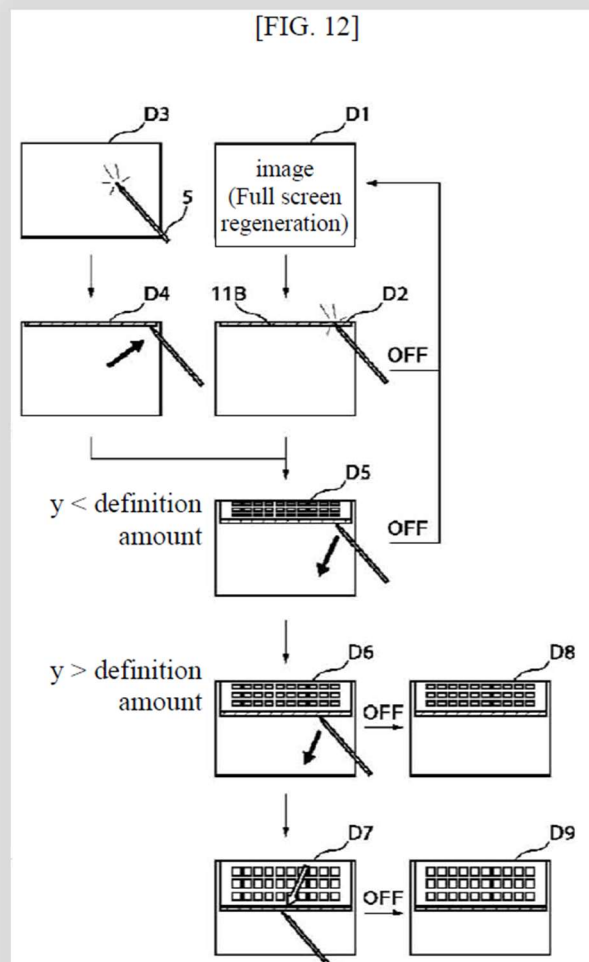
65. A POSA would have understood that in touch activated selection, the processing of a function is activated upon the event of detecting the coordinates of the initial touch of the input device on the touch sensitive display within the coordinates of the desired button or icon. In programming, this event is referred to as “mouse down.” It corresponds to a downward press on the left button of a mouse with processing activated upon completion of the left button depression. A POSA would have understood, in contrast, that in tap-activatable selection, the processing of a function is commenced upon the event of the input device lifting off of the touch sensitive display from the coordinates of the desired button or icon. In programming, this event is referred to as “mouse up.” It corresponds to a

downward press on the left button of a mouse, followed by a release of the left button at a predetermined cursor location on a conventional monitor and desktop system with a mouse as the input device, with processing activated upon the release.

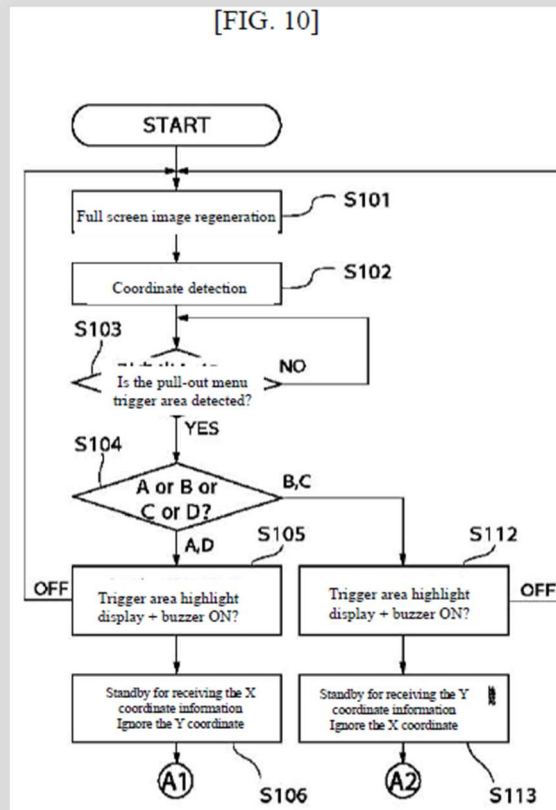
66. In Hisatomi, all processing, whether of the menu displays or the GUI function buttons, is activated upon the event of detecting the coordinate value of the touch within the coordinates of either the pull-out menu activation area or the GUI function button. There is no disclosure in Hisatomi of processing being activated by an “OFF” event (mouse up).

67. As shown in FIG 13 reproduced in paragraph 46, above, activation of processing represented by a GUI function button (step S211) occurs based upon detection of the coordinate value of the input device’s touch (step S202) within the coordinates of a selected GUI function button (step S210). EX1005, FIG 13. In every instance shown on Figure 13, the occurrence of an “OFF” event does not activate processing, but to the contrary causes the processing to loop back to the coordinate detection steps at S202, S203 and 210. *Id.*

68. Hisatomi teaches repeatedly that an “OFF” event does not activate processing. Another example is illustrated in Image D2 of FIG 12, reproduced below:

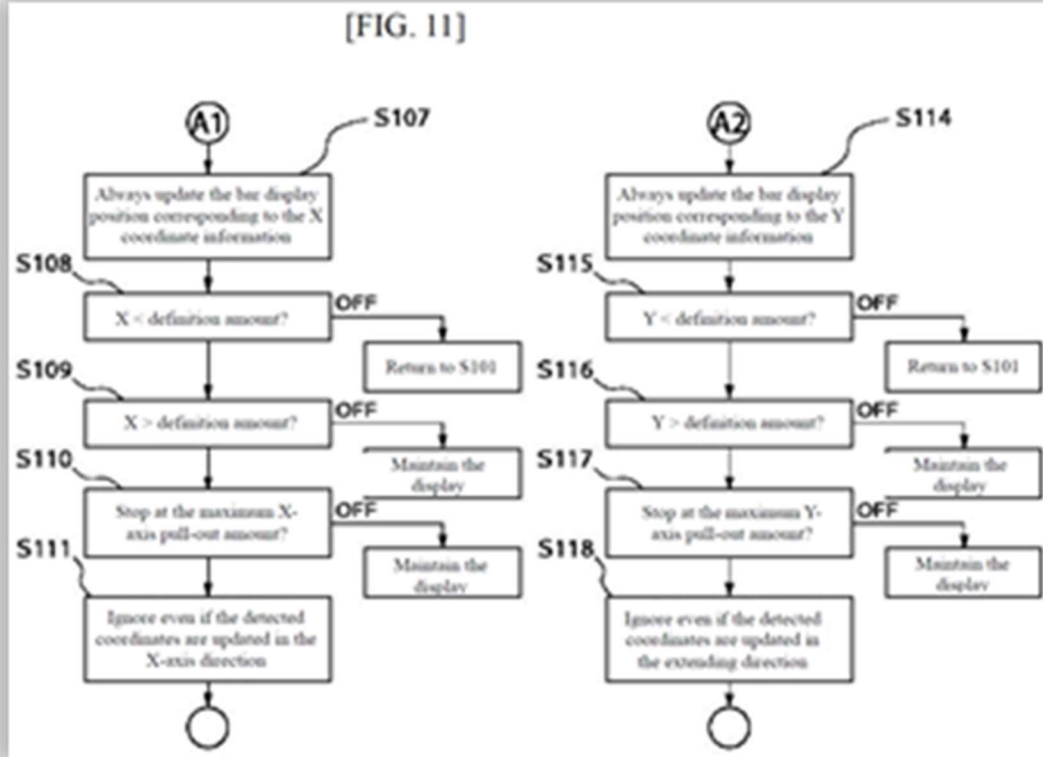


EX1005, FIG 12. The associated processing is illustrated in FIG 10, reproduced below:



EX1005, FIG 10. Hisatomi explains “as shown on screen D2 in FIG 12, even if the detected coordinate value is included in one of the pull-out menu display trigger areas 11A to 11D, if it went OFF, the process will return to step S101.” *Id.*, ¶0041. Similarly, in steps S105 and S112, a touch in the pull-out menu display trigger area followed by a drag will cause the pull-out menu to be displayed, but “if it went OFF during this period, the process will return to step S101.” *Id.*, ¶0043. There are many more such examples in Hisatomi. *Id.*, e.g., ¶¶0048, 0052, 0057.

69. The processing associated with the drag gesture to open the pull-out menu, as illustrated in Figure 12, is shown in Figure 11, reproduced below:



EX1005, FIG 12. Hisatomi explains that in step 114, “the display amount of the pull-out menu will be updated according to the Y coordinate value generated by the input device 05,” but if “the menu pull-out amount y is less than the defined amount, if it became OFF as shown on screen D5 in FIG. 12, the process of pulling out the menu will be cancelled midway and the process will return to step S101 (S115).” Id., ¶0048, 0052. Step S101 is the full-image display mode that precedes coordinate detection. Id., FIG 10. If the Y coordinate exceeds the defined amount when the OFF event occurs, “the process of pulling out the pull-out menu will be stopped....” Id., ¶0048, 0052.

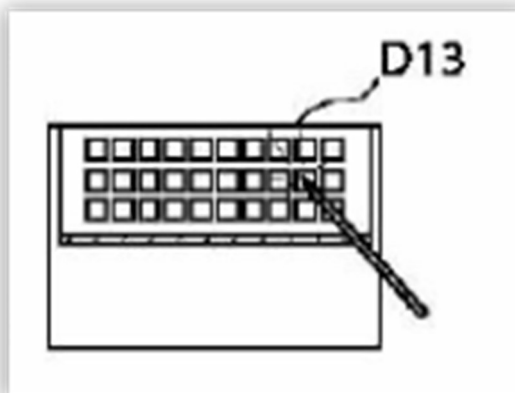
70. In each instance disclosed in Hisatomi, processing is activated by detecting the coordinates of the input device's touch on the touch sensitive screen (mouse down), and an "OFF" event (mouse up), terminates any active processing and loops back to the coordinate detection step.

71. The touch of Hisatomi specifies that an action happens when the input device makes contact with the touch screen. The tap of the '993 Patent specifies that an action happens when the input device is lifted off from the touch screen. User interface designers and programmers know that they have options when designing and implementing a user interface and can specify actions happening with either a touch event or a tap event. A POSA would understand that the touch disclosed in Hisatomi is not the same as the tap disclosed in '993.

72. Petitioners cite Dr. Bederson's declaration for the proposition that "each icon is capable of selection (activation) by a user touching or tapping the icon with the pen device." Pet., p. 34; EX1002, ¶130. But in paragraph 130, Dr. Bederson fails to distinguish between touch activation (mouse down) and tap activation (mouse up). He states that "touching an icon on the screen with the pen (i.e., performing a tap) will select an icon and its related function." EX1002, ¶130. But for support, he cites Hisatomi's disclosure that "[t]he touch panel sensor 11 on the image display screen 09 is touched by the pen-type input device 05, the coordinate is designated by this touch, and various functions can be selected." *Id.*,

quoting EX1004, ¶0015. This quote describes touch activation (mouse down) because it is the coordinates of the touch that selects the function, not the event of lifting off of those coordinates (mouse up).

73. Dr. Bederson cites Image D13 in Figure 15 of Hisatomi as illustrating “a user touch on an icon within a pull-out menu,” reproduced in pertinent part below:

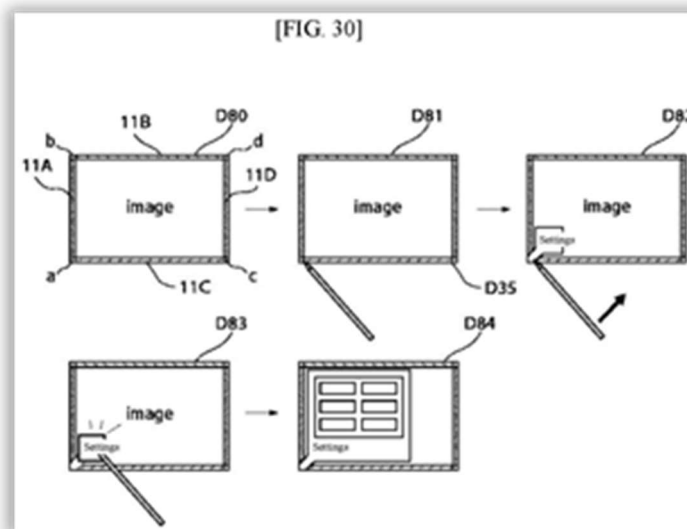


EX1005, FIG 15. But the issue here is whether Image D13 discloses touch activation, as Dr. Bederson appears to acknowledge, or tap-activation.

74. The accompanying text for Image D13 makes clear that activation is by touch, not tap. There, Hisatomi discloses that if “the coordinate value detected at step S102” (of Figure 13, reproduced above) is not in the pullout menu trigger areas, “it is determined whether or not the specific function button (GUI function button) in the pull-out menu was selected by the input device 05 (S210); if it is selected, the selected function will be processed.” EX1005, ¶0055. Selection is

determined by “the coordinate value detected at step S102” in Hisatomi, and activation is based on the coordinate value of the touch (“if it is selected, the selected function will be processed”), not by an “OFF” event (mouse up). *Id.*

75. The Petition also cites Figure 30 Image D84 as depicting a tap-present state. Pet., p. 35. Figure 30 is reproduced below:



76.

EX1005, Fig. 30. The illustrations clearly illustrate a drag-activation gesture, not tap-activation, as the accompanying text confirms. EX1005, ¶0126. .

77. Petitioners also cite Hisatomi’s ¶0030, but this text clearly describes touch, not tap, activation.

78. For at least the reasons described above, Hisatomi does not disclose a “tap-present state” wherein “a plurality of tap-activatable icons for a respective plurality of pre-designated system functions are present, each system function being activated in response to a tap on its respective icon.”



**b. A POSA Would Not have been Motivated to Incorporate the  $a \rightarrow c \rightarrow a$  Variant of Ren's Direct Off Strategy into Hisatomi (Limitation 1[b])**

79. Dr. Bederson states that tap was a known user interface activation strategy at the time of the invention and that it “would have been obvious to a POSA” to modify Hisatomi such that the icons were selected using tap instead of touch. EX1002, ¶136. However, the reasons he gives do not provide any POSA motivation to do so, and in material respects are incorrect. In my opinion, a POSA would not have been motivated to change Hisatomi's display from a touch-activated implementation to a tap-activated implementation, for at least the following reasons.

80. Dr. Bederson posits four reasons why his proposed modification to Hisatomi would have been “obvious”:

- “The tap selection technique was one of a handful of well-known selection techniques for selecting a target (such as an icon or menu) in a GUI at the priority date of the '993 Patent.”
- Ren “teaches the desirability of using the tap or *Direct Off* technique, for example, in dense displays where targets are close together.”
- “The ubiquity of the tap selection technique also would have motivated a POSA to use it for selection of the icons, . . . .”

- “It would have been within the level of ordinary skill to implement such a technique with predictable results, . . . .”

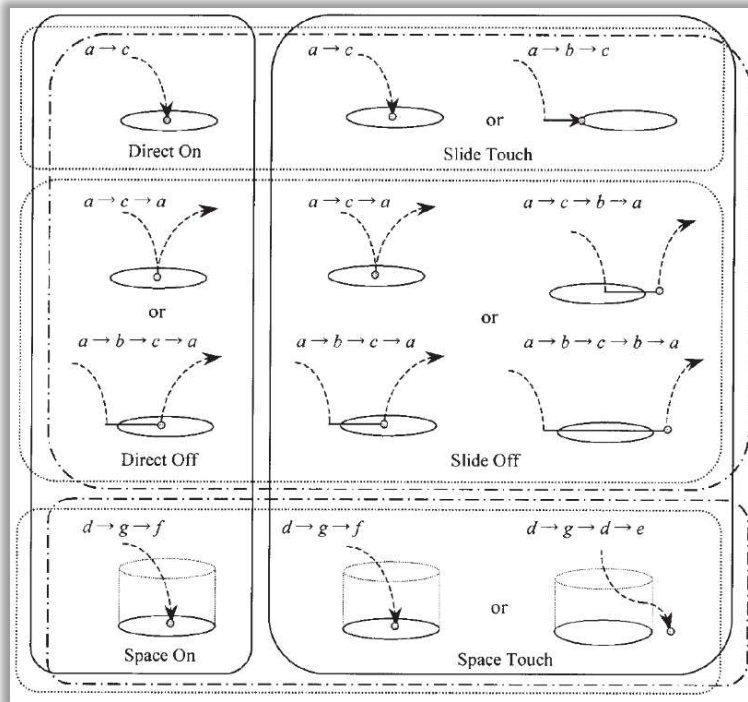
EX1002, ¶136.

81. Of these, Dr. Bederson’s assertion regarding the teaching of Ren is wrong; in fact, Ren teaches the opposite. His remaining assertions merely indicate that it would have been considered technically possible to change Hisatomi’s touch-activated icons to tap-activated icons, but provide no motivation to do so.

**Ren’s Experimental Results Would Lead a POSA to Use Touch, and Avoid Using Tap, on a Display Like Hisatomi’s**

82. Ren is a research paper. EX1006, p. 384. It discloses the results of, and conclusions drawn from, two experiments comparing “pen-based selection strategies and their characteristics.” *Id.* Ren “looks at selection strategies suitable for selecting small targets, and identifies and quantifies the influential factors that make strategies more or less efficient with a view to improving selection performance on pen-based systems.” *Id.*, at 386.

83. Six activation strategies were tested in the Ren experiments, illustrated in Figure 3 and reproduced below:

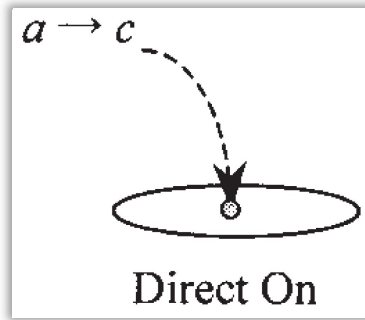


EX1006, FIG 3. The arrows in Figure 3 show the direction of pen-tip movement.

*Id.*, at 389. Dashed lines indicate that the pen-tip is not in contact with the screen surface, and solid lines show that the pen-tip is in contact with the surface.

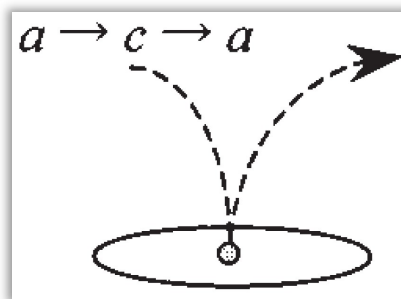
According to Ren, all six strategies were known as of the '993 Patent's time of invention. *Id.* at 391.

84. In the Ren taxonomy, "*Direct On*" is an example of the touch activation (mouse down) strategy taught by Hisatomi, illustrated in Figure 3:



EX1006, FIG 3.

85. The Direct Off strategy is defined by the fact that the pen is lifted off the display from within the target. EX1006, p. 390. It includes two variants – a movement that touches the display outside the target, slides into the target and lifts off (the  $a \rightarrow b \rightarrow c \rightarrow a$  variant), and a movement that touches the display inside the target and lifts off (the  $a \rightarrow c \rightarrow a$  variant). Ren's  $a \rightarrow c \rightarrow a$  variant is also illustrated in Figure 3:



*Id.*

86. In the first Ren experiment, subjects were given a touch sensitive display and stylus pen. EX1006, at 393. Each device was configured to test a single activation strategy. *Id.* Subjects were told to select a target as quickly and

accurately as possible using the strategy provided. *Id.* The results were tabulated to evaluate how quickly subjects could select the target and the accuracy of the selection. *Id.* In addition, subjects filled out a questionnaire in which they were asked to rate the strategy on a scale of 1 to 5 regarding selection accuracy, selection speed, selection ease, learning ease, satisfaction, and desire to use. *Id.*

87. Dr. Bederson states that Ren “teaches the desirability of using the tap or *Direct Off* technique, for example, in dense displays where targets are close together.” Exhibit 1002, ¶136. But in fact, Ren states that both Direct On and Direct Off “can be used” in dense displays. EX1006, at 20. This states no more than was already known – both were technically viable for dense displays. Ren explicitly states no preference for one over the other. It follows from this alone that Ren provides no motivation for a POSA at the time of the ‘993 Patent’s invention to modify Hisatomi’s Direct On/touch teaching with the Direct Off/tap teaching of Ren.

88. But by far the most significant aspect of Ren is not what it says, but what it shows. Over and above Ren’s express statements, its experimental results provide a powerful incentive to a POSA not to modify Hisatomi as Dr. Bederson suggests. Ren’s results show that for displays like Hisatomi’s, the Direct On (touch) technique was better across both speed and accuracy than the  $a \rightarrow c \rightarrow a$  Direct Off strategy.

89. First, Ren confirmed experimentally that activation happens faster with Direct On. The associated activation happens faster with Direct On in part because the processing begins immediately. With Direct Off, the user has to first perform a Direct On before lifting the finger or stylus to execute a Direct Off and begin the processing. In the context of Experiment 1 in Ren, Figure 5 shows that the selection time was faster with Direct On (1027.5ms) compared to Direct Off (1543.9ms). Similarly, in the context of Experiment 2 in Ren, where a wider range of icon sizes was used, Figure 11 shows that the selection times were even faster with Direct On (1079.5ms) compared to Direct Off (1615.3ms). Both experiments in Ren concluded that in terms of activation time, Direct On was preferred over Direct Off.

90. In addition, Ren's experimental design suggests to a POSA that in the real world the difference in selection speed between the two strategies would have been even greater. Ren measured selection time for Direct On as "[t]he time lapsed between display of the target and the moment when the pen contacted the screen," but measured selection time for Direct Off as "[t]he time lapsed between contact with the target and removal from the screen," EX1006, at 394-95, i.e., Ren omitted from the selection time for Direct Off (but not for Direct On) the period from the display of the target to when the subject had placed the pen in contact with the target. As a POSA would have understood, this biased Ren's results

against Direct On in relation to what a POSA would have been programming for in the real world; despite this bias, Direct On was the clear winner.

91. Ren's Figure 6 and associated text states that the Direct Off strategy had a lower mean error rate than did the Direct On strategy in Ren's Experiment 1. However, this was likely nothing but an artifact of the design of the Ren experiment. Ren's Direct On strategy had only one route that yielded a successful selection – a direct touch from off of the display onto the target. Conversely, Ren's Direct Off strategy had two routes that yielded a successful selection – a direct on-off movement and also a movement beginning anywhere outside the target and sliding into the target before lifting off. EX1006, at 390 [Fig. 3 & Table I]. This artificially inflated the error rate for the Direct On strategy in relation to Direct Off.

92. I believe that there was another factor that exacerbated this artifact. Ren used an experimental setup in which the test subjects were required to place the pen on the tablet on an "initial position" displayed at the center of the screen. EX1006, at 393. A target would then be randomly displayed on the screen, and the subject was asked to select the target using a designated strategy "*as quickly and accurately as possible . . .*." *Id* (italics in original). This design, in which the subject was required to begin the selection process with the pen touching the display, required the subjects to first pick the pen up, then quickly bring it back

down again on the display, does not accurately model the typical user interaction with a touchscreen display, in which the user typically begins the selection movement from a position above the display and can bring the pen or object directly down onto the display in a fluid motion directly to the location of the desired icon. A POSA would have expected this aspect of Ren's experimental design to detrimentally impact the accuracy of Ren's Direct On strategy more significantly than the Direct Off strategy. The movement of picking the pen up off the surface of the display before bringing it quickly back down onto a different location on the surface of the display would not be typical human-computer interaction and would be expected to induce greater error where the user is required to bring the pen down directly onto a target (Direct On) than when the user could bring the pen down anywhere on the surface and then slide onto a target (Direct Off). This is particularly true here since the targets used in the Ren experiments were quite small. This user-initiated error correction strategy was possible in Ren's Direct Off technique, but not in the Direct On technique.

93. In addition, the size of Ren's "targets" has a direct material impact on mean error rates, and Ren disparages the significance of differences in error rates for targets of a size for which a POSA would have been programming. Ren discloses that it varied the target sizes, and that while there were significant differences in error rate for smaller targets (sizes of approximately 1 to 2 mm) in



Experiment 1, “there was no significant difference in error rate for the target size 9 pixels [approximately 3 mm], . . . .” EX1006, at 399. For comparison, an icon on the Home Screen of an iPhone is about 11 mm in horizontal diameter. Given the size of the Hisatomi display, the icons in the pull out menus would have been understood to be at least 3mm in diameter, and very likely much larger. So, Ren does not teach a POSA that there would have been any benefit in terms of a lower mean error rate to using the Direct Off as opposed to the Direct On strategy.

94. In addition, a POSA would understand that the extremely small size of Ren’s targets renders these results irrelevant to the accuracy of target selection as applied to the selection of icons in the real world. Icons 1-3 mm in width are simply too small to be used effectively in consumer-facing applications such as mobile handheld devices, and a POSA would have known this.

95. And it would have been notable to a POSA that in reporting the results of the second experiment, focused on determining the effects of varying target sizes on a more granular level, Ren determined that the error rate differential between the Direct On and Direct Off strategies largely disappeared for targets of 2.5mm diameter, and that Direct On had a lower error rate for targets of 3mm diameter, EX1006, at 408 [Fig. 10], indicating a trend favoring Direct On by even greater margins for larger icons. A POSA would have read this teaching of Ren to

disclose a sound basis for using the Direct On strategy, as it was superior to the  $a \rightarrow c \rightarrow a$  variant of Direct Off in both speed and accuracy.

96. For at least the foregoing reasons, a POSA would have understood that, to the extent that it is even relevant given its methodological flaws biasing the results against the Direct On strategy and undermining its applicability in the real world, Ren taught that the Direct On strategy was superior to the  $a \rightarrow c \rightarrow a$  variant of Direct Off for displays such as Hisatomi's, and taught away from using Direct Off for such displays.

**A POSA Would have Seen No Deficiency in Hisatomi to be Remedied by Tap**

97. Another reason that a POSA would have seen no reason to change the Hisatomi interface to make the GUI function buttons tap-activatable rather than touch-activatable is that a POSA would have perceived no deficiency in Hisatomi that would have been remedied by making that change. The principal reason a programmer would have coded an action to be executed upon lift-off from the display as opposed to upon touch would be to differentiate from certain functions executed based on a sustained contact with the display, such as a drag and drop operation. For example, in Microsoft Windows in 2002 a "mouse down" (touch) operation on a desktop icon would enable a user to drag the icon to another location on the display but would not activate the function represented by the icon; that would only happen if the user conducted a quick "mouse down" - "mouse up"

(tap) operation. In Hisatomi, however, there is no disclosure that the pull-out menu icons are movable via a drag and drop operation, nor do the images in Hisatomi suggest that they would have been. There would therefore have been no benefit to delaying activation after the initial touch to detect an “OFF” event (mouse up) in Hisatomi.

**The Disadvantages of a Hisatomi-Ren Combination Would Outweigh Any Benefits**

98. As discussed above, a POSA would have understood from Ren that exchanging Hisatomi’s GUI buttons (Direct On) for an  $a \rightarrow c \rightarrow a$  Direct Off activation interface would have provided no benefit to Hisatomi in terms of speed of execution, reduced error rates, ease of use, or any other relevant metric, and would have understood that doing so would have denigrated the Hisatomi interface with respect to at least speed and accuracy. In light of the teaching of Ren, particularly where a user is likely to be using applications for which responsiveness and accuracy are important (such as a character input function or an image processing function, like Hisatomi’s B and C classification menus, EX1005, ¶0022), touch-activated buttons would be preferred by a POSA.

**Tap's "Ubiquity" and Predictable Results Would Not have Made it Obvious  
to Try**

99. Dr. Bederson states that tap was a known user interface activation strategy at the time of the invention. In addition to tap, touch was another known user interface activation strategy at that time. *E.g.*, EX1006, at 391. When the interface is configured to utilize touch (as opposed to tap), the activation happens at the moment that the user touches the element on the screen. If the software designers wanted whatever desired action to happen at the moment that the user makes contact, they would utilize touch instead of a tap.

100. Other activation strategies that would have been known to the POSA include a drag where a user would select an icon or an object (e.g. a button) with a touch and then keep the finger or stylus down on the display as they drag the finger or stylus to another location wherein they would lift the finger or stylus. Drag was typically used to move or copy items from one location to another location. Another interface activation strategy that was known at the time was a long-press. When a user held a finger or stylus down over an icon or object for more than a given amount of time, the system could activate an alternative function associated with the long-press.

101. In this way, system designers and implementers could have multiple various actions that were associated with icons or objects. Action 1 could be

associated with a touch (e.g. the action happens at the time that a finger or stylus touches the display), Action 2 could be associated with the tap (e.g. the action happens at the time that the finger or stylus is lifted from the display). Action 3 could be associated with a drag (e.g. the action happens when the icon or object is dragged from one place to another place). The action could be associated with surpassing a minimum distance of dragging or it could be associated with releasing the icon or object over a specific target. Action 4 could be associated with a long-touch (e.g. the action happens when the finger or stylus is down over the target for greater than a predetermined amount of time).

102. Dr. Bederson states that tap's "ubiquity" would have motivated Hisatomi's modification, but touch was also widely used at the time of the invention and would not have been unfamiliar to users. Nor does he account for any of the other known activation strategies. So tap's mere "ubiquity" would not have motivated a POSA to modify Hisatomi's interface.

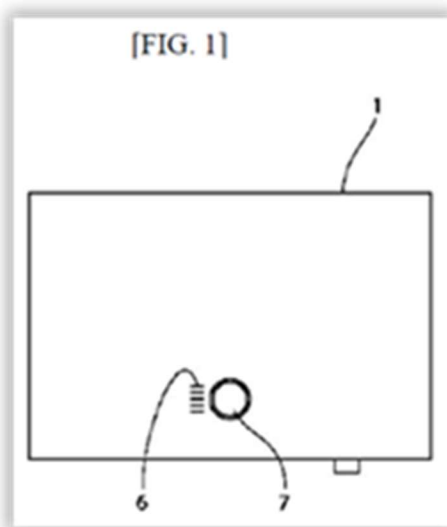
103. To the extent that substituting tap-activation for the touch-activated buttons of Hisatomi would have yielded predictable results, Ren informed a POSA that the results would have been predictably inferior in terms of speed and error rate. A POSA would not have seen this as a motivation to modify Hisatomi in such a way.

104. For the reasons set forth above, none of Dr. Bederson's purported reasons underlying his conclusion that it would have been "obvious" to modify Hisatomi to use tap- rather than touch-activation actually support his conclusion. A POSA would have seen no motivation to modify Hisatomi in such a manner.

**c. Hisatomi does Not Disclose Icons for a Plurality of System Functions (Limitation 1[b])**

105. Dr. Bederson provides no support for the GUI function buttons of Hisatomi corresponding to the "system function" icons of Claim 1. With reference to dependent claim 6, however, he argues that Hisatomi discloses "system functions" in paragraphs 0013-14 and Figure 1 (for Hisatomi, Bederson confusingly cite to EX1004, which is his own *curriculum vitae*). EX1002, ¶178. Hisatomi does not disclose this limitation.

106. Hisatomi paragraphs 0013-0014 describe hardware—that the disclosed device is equipped with a camera 07, microphone 06, and shutter switch 08. EX1005, ¶0013-14. The shutter switch is a two-position mechanical switch. *Id.* Figure 1 illustrates the side of the device that contains the camera and microphone hardware, as shown below:



EX1005, FIG 1. The “GUI function buttons” taught by Hisatomi are not disclosed in paragraphs 0013-0014, nor are they illustrated on Figure 1, and they are not identified as icons for “system functions” as described and claimed in the ‘993 Patent.

107. Dr. Bederson also refers to Hisatomi’s “function lists” as including system functions, referring to such things as character input, color palette selection, search, save, etc. EX1002, ¶178. However, these are not system functions; rather, they are the types of functions that the ‘993 Patent specification described as functions of an active application. EX1001, 4:31-35.

108. In addition, even if at least some of the cited functions were found to be system functions, Hisatomi’s pull out menus do not contain icons for system functions. Claim 1 focuses on what is presented to the user – the icons and what they represent – not on the underlying functionality, as befits a patent directed to a

novel user interface. As the ‘993 Patent specification teaches, an icon presented within an application is not an icon for a system function, regardless of whether the function that it represents will ultimately involve a call to an operating system function. For example, a “save” icon presented in the Word application is not an icon for a system function; rather, it is an icon for an application function (the “save” function enabled in Word), even though the application programming may make a call to the operating system in connection with a save command. This is consistent with the ‘993 Patent’s teaching that a “save” or “delete” command entered in an active application is an aspect of the unclaimed embodiment involving icons for application functions. EX1001, 4:31-35.

109. Hisatomi discloses a device for taking, storing and processing images. And a POSA would understand that the GUI pull out menus enabled on the Hisatomi device present icons for an application – a digital camera application. This is clear from Figure 9, which depicts the high-level process flow of the device. The first step taken by the device upon Power ON (S11) is “Regeneration,” which involves regenerating previously taken images so they “become a display state possible to be viewed like an album.” EX1005, ¶0034. From here, the user may, e.g., take a photo by pressing the shutter switch, or pull out a menu. EX1005, ¶0035-36. At this point, it is clear that the device’s camera application is already active – it is presenting an album of photos on the display



screen. Accordingly, the icons presented by Hisatomi's pull out menus are not icons for system functions; rather, they are icons for services or settings of the device's camera application.

110. In sum, Hisatomi does not disclose "tap-activatable icons for ... system functions" claimed in the '993 Patent.

## **2. Claim 3**

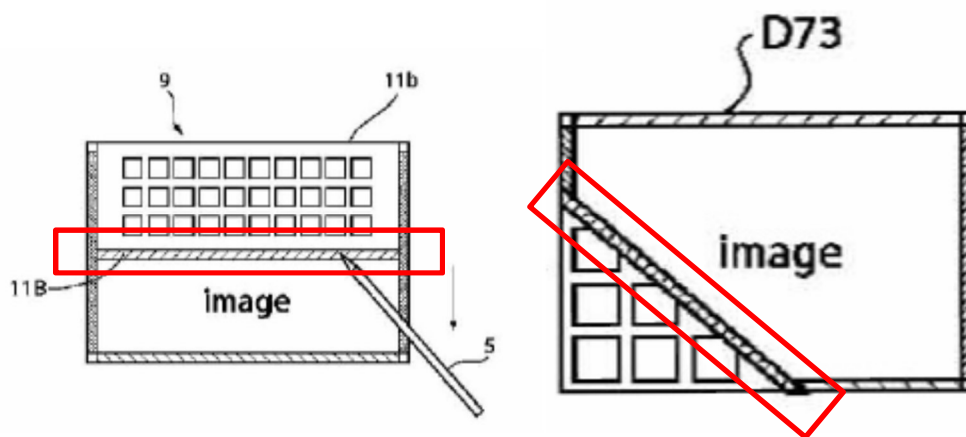
111. Claim 3 recites "[t]he computer readable medium of claim 1, wherein the tap-present state does not display the tap-activatable icons within a window frame."

112. Dr. Bederson relies on Hisatomi for disclosure of tap-activatable icons that are not displayed in a window frame. However, all of Hisatomi's (touch)-activatable icons are depicted within a window frame.

113. Dr. Bederson points to Figures 7 and 28 (image D73), asserting that the icons are not contained within a window frame because "the icons cannot be moved and remain anchored to an area." Pet., p. 51. Whether the icons can be moved is, however, beside the point; what is relevant here is that there is a border (frame) between the windowed content and the remainder of the GUI, and the window displays output from and allows input to one or more processes that may be separate from those executing on the GUI outside the window. In addition, the fact that a border (or frame) between regions of the GUI is movable, while not

required, is strongly indicative that a bounded region constitutes a separate window from the rest of the GUI. Petitioners also think it important that Hisatomi's "function list" may be expanded to cover the entire screen, but this again is irrelevant, as the area enclosing the pull-out menus may be contracted at will by the user, just as a window containing a Word document may be expanded to cover an entire display or contracted at will.

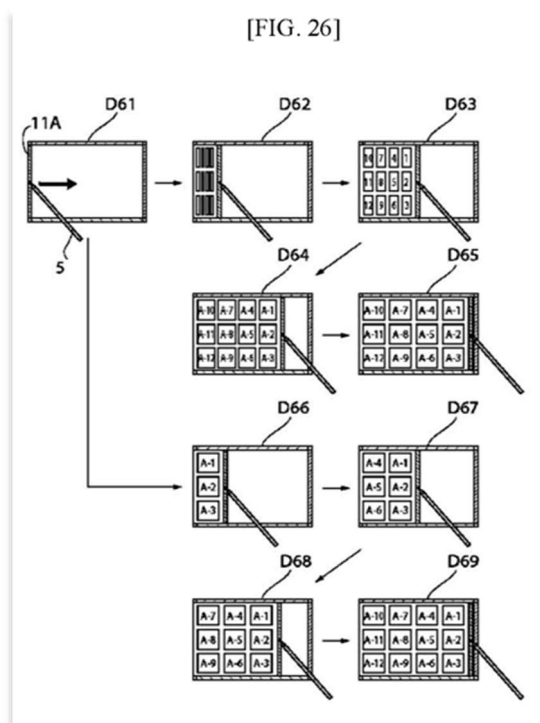
114. Dr. Bederson's selected images show that Hisatomi's pull-out menu icons are enclosed within a movable border functionally separating the enclosed icons from the remainder of the GUI:



Pet., p. 51. The movable border defines the working area within which Hisatomi's icons may be activated; inputs at a location on the display that is within the area defined by the movable border will execute different functions than they would at the same location if the border were scrolled closed and no longer encompassed that location.

115. Dr. Bederson also cites Hisatomi paragraph 0246 for disclosure of tap-activatable icons not displayed in a window, but this paragraph states only that “the pull-out menu can be stopped without stages at any pull-out position during pull-out,” and that the pull-out menu window may have various sizes depending on how far the user pulls the menu out. There is no disclosure of a pull-out menu that is not in a window frame.

116. Dr. Bederson further cites Hisatomi paragraphs 0099, 0101-103 and 0108. But these paragraphs reference Hisatomi Figure 26, and state that “as shown on screens D65 and D69 of FIG. 26 the entire display area of the image display screen 09 will be used for displaying the pull-out menu.” EX1005, ¶0101; *see also*, ¶¶0102-103. However, images D65 and D69 of Figure 26 show the icons within a window frame inside the display area, movable horizontally across the display, as shown below:



The cited Hisatomi paragraphs and the above figure do not disclose tap-activatable icons not displayed in a “window frame,” as that term would have been understood by a POSA.

117. Every depiction of pull-out menus in Hisatomi shows them framed by a border that is movable in at least one direction. The movable border defines the working area within which Hisatomi’s icons may be activated. As it is scrolled across the screen, the space available for Hisatomi’s “image” in the display area is reduced, and as it is scrolled back to the display edge, the space available for Hisatomi’s image increases. Consequently, a POSA would understand that Hisatomi’s movable “trigger areas” are a window frame, and that the icons in Hisatomi’s pull-out menus are displayed within a window frame.

**3. Claims 2, 7-8**

118. I understand that claims 2, 7 and 8 include all of the limitations of claim 1, in addition to the elements they specifically recite. Therefore, my analysis, opinions and conclusions concerning claim 1 apply to the same extent with respect to claims 2, 7 and 8.

**B. Ground 1B: Claim 4**

**1. Allard-656 is Not in the Same Field of Endeavor as the ‘993 Patent, and is Not Reasonably Pertinent to the Problem the Inventor Sought to Solve**

119. Claim 4 recites “[t]he computer readable medium of claim 1, wherein the plurality of pre-designated system functions comprises a help function.” Dr. Bederson cites the combination of Hisatomi and Allard-656 to render claim 4 obvious. Dr. Bederson asserts that Hisatomi discloses function lists, and it would have been obvious to a POSA to include a Help function because it is among “a handful of common and typical functions a POSA would have known to include, or at least would have been obvious to try, in a user interface ....” EX1002, ¶167. He then points to the disclosure of a Help function in Allard-656 as evidence that a Help function was well-known. *Id.*

120. I understand that prior art is reasonably pertinent to an invention when the matter with which it deals would have logically commended itself to an

inventor's attention in considering his problem. Using that standard, I do not believe that Allard-656 would have logically commended itself to the inventor of the '993 Patent.

121. First, I do not believe that a POSA attempting to solve the problem identified by the inventor of the '993 Patent would have considered the Allard-656 reference to be in the same field of endeavor as the '993 Patent.

122. The title of the patent is: "USER INTERFACE FOR MOBILE HANDHELD COMPUTER UNIT." EX1001. The Abstract begins: "The present invention relates to a user interface for a mobile handheld computer unit, . . . ." EX1001, Abstract. The figures illustrating the invention all depict a display of a handheld computer unit, or the front of the handheld computer unit, or a user's thumb or finger interacting with the display. EX1001, Figs. 1-14. The specification explains that "[t]he present invention relates to a user interface for a mobile handheld computer unit, describes "[m]obile handheld computers" in the description of background art and identifies the "[t]echnical problems" as including that of providing "a simple way to make the most commonly used functions for navigation and management available in the environment of a small handheld computer unit." EX1001, 1:14-18, 1:33-36, 1:55-2:4. The "Solution" is addressed "with the staring [sic] point from a user interface for a mobile handheld computer unit," EX1001, 2:8-10, and the "Advantages" are described as "primarily

associated with a user interface or a computer readable medium according to the present invention reside in the ability to establish a user friendly interface for small handheld computers, . . . .” EX1001, 3:19-24. The description of the preferred embodiments is directed to “a user interface for a mobile handheld computer unit.” EX1001, 3:57-58. Claim 1 recites that the invention claimed is “[a] non-transitory computer readable medium storing instructions, which, when executed by a processor of an electronic device having a touch-sensitive display screen, cause the processor to enable a user interface of the device, . . . .” EX1001, 6:50-53. A POSA would understand that the field of endeavor of the ’993 Patent is that of user interfaces for handheld mobile computer units.

123. The field of endeavor of Allard-656 is that of mechanical engineering. Allard-656 is directed toward adjusting the contrast control of an LCD display using external mechanical buttons when the user interface is opaque or transparent. It is not concerned with how a user interacts with the user interface displayed on the LCD, because the starting point of Allard-656 is that the user interface is not visible to the user without adjusting the LCD’s contrast. This is the antithesis of the ’993 Patent, which is drawn to features of the user interface, and touch screen gestures that the user may execute to operate functions displayed on the user interface.

124. In addition, the problem addressed by *Allard-656* bears no logical relation to the problem addressed by the '993 Patent. The problem the '993 Patent sought to solve was providing an easily navigable user interface for a small handheld computer unit. In the description of the background art, the specification notes that the “need to manage more information has led the development towards new solutions regarding user interfaces and navigation.” EX1001, 1:44-46. As a result, “[t]he PDA’s and mobile phones are getting larger and larger in order to provide a user-friendly interface.” *Id.*, 1:46-47. However, “[s]ince the users have gotten used to small handheld units, it is hard to move towards larger units.” *Id.*, 1:38-39. This has “led to foldable keyboards, different kinds of joy sticks and different kinds of touch sensitive displays and pads intended to help in providing a user interface that is suitable for small handheld computer units.” *Id.*, 1:48-53. The specification describes the problem solved by the invention, to provide a user interface that is “user-friendly,” or “simple to use,” etc. EX1001, 1:59-65. The solution is a touch sensitive screen with a user interface displaying representations of functions and icons that are activatable by user gestures.

125. The problem *Allard-656* sought to solve was entirely different: that of how to adjust an LCD display’s contrast level when the user interface is either opaque or transparent and therefore not usable by the user. This problem bears no relationship to the problem addressed by the '993 Patent, which is how to improve



user interaction with a displayed user interface using graphical features and gestures *without* using external devices.

126. Allard-656 is a mobile communication device with a liquid crystal display (LCD). The problem addressed is that the device may be exposed to wide temperature extremes that affect the LCD display's contrast. EX1007, 1:63-66. Cold temperatures render the LCD opaque, and hot temperatures render the LCD transparent. *Id.*, 1:66-68. The invention seeks to “provide an improved contrast control for an [sic] touchscreen display having an LCD subject to use under a wide range of temperature conditions, including those which may eliminate any visible contrast.” *Id.*, 2:29-34. In fact, the title of the patent is “Personal Communicator Having Improved Contrast Control for a Liquid Crystal, Touch Sensitive Display.”

127. A POSA would understand that since Allard-656 is directed to adjusting the LCD's contrast when the display has become opaque or transparent, a user interface solution would not work. Allard-656's solution is to adapt the device's external mechanical volume buttons to adjust the LCD's contrast:

in accordance with the invention, a personal communicator has a touch sensitive overlay coupled with a liquid crystal display (LCD). The communicator has two external (non-screen) up/down buttons for adjusting the volume of a cellular phone speaker. These volume buttons are also used to allow the user to adjust contrast. In accordance with one embodiment of the invention, contrast is adjusted in response to the user touching a predetermined area of the screen at the same time as one of the up or down buttons is actuated. In accordance with another

embodiment of the invention, contrast is adjusted in response to the user first pressing both speaker volume buttons to enter a contrast adjustment mode, and thereafter pressing one or the other of such buttons, to increase or decrease contrast as desired.

EX1007, 2:59-3:5.

128. A POSA would have viewed the problems addressed by Allard-656 and the ‘993 Patent is logically distinct. The problem addressed by Allard-656 is how to adjust contrast of a user interface on a display screen when the user interface cannot be displayed. That led the Allard-656 inventor to adapt external mechanical buttons to adjust contrast. Simply put, interaction with the user interface can play no role in solving the problem to which Allard-656 is drawn. But the ‘993 Patent is specifically drawn to improvements in a user’s interaction with a user interface on a touch sensitive display. The ‘993 Patent’s inventor would not have been logically drawn to consult Allard-656 for a solution.

**2. A POSA Would Not have been Motivated to Combine Allard-656 with Hisatomi**

129. In addition, I do not believe that a POSA would have been motivated to incorporate the Help icon shown in Allard-656 into the device of Hisatomi.

130. Dr. Bederson contends that “[a] POSA would have been motivated to do so at least because utilizing a Help icon was a well-known practice with benefits that would have been immediately apparent to a POSA.” X1002, ¶168.

While providing access to a Help function may be a well-known practice with apparent benefits, I do not agree that doing so in the form of a Help icon would provide a favorable tradeoff of benefits and detriments in a device such as Hisatomi's.

131. A POSA would understand that Hisatomi addresses a Help function, and provides its own solution. Hisatomi notes that “it is not possible to grasp the function items described in each pull-out menu until the pull-out menu is displayed,” and consequently, the user must “remember in advance what kind of function items are included in each menu.” EX1005, ¶0222. As a solution, Hisatomi teaches that when the pointing device is placed on an icon that corresponds to a function, “a part of the pull-out menu will be cut out and then displayed as the ‘partial cut-out help in the pull-out menu,’ so as to make it easy to check the contents of the pull-out menu.” *Id.*, ¶0223. Hisatomi then discloses how to implement this Help function in Figs. 55, 57 and paragraphs 0224-240.

132. Dr. Bederson states that a POSA would have understood that Hisatomi's popups “may not be desirable, particularly in mobile electronic devices with smaller screens where the information within the popup could easily be obscured by the finger or object touching the screen.” EX1002, ¶168. However, this would not apply to Hisatomi's device, which was the size of a notebook (i.e., laptop). EX1005, ¶0012. In any event, the same observation may be made

concerning Dr. Bederson's proposed solution of adding a Help icon to Hisatomi's display, in that if a user were to activate the icon the resulting text would have to appear on the display and could be obscured by a finger or other object touching the screen to the same or greater extent as Hisatomi's popup Help text. So this purported POSA understanding would have provided no motivation to change Hisatomi's Help function in the manner proposed by Dr. Bederson.

133. So Hisatomi already disclosed a Help function, which did not include a dedicated help icon, to avoid the "annoyance" of having to pull each particular menu out as a precondition to check its contents. EX1005, ¶0222. A POSA would have seen no deficiency in Hisatomi's solution to be remedied by the addition of a "Help" icon, and adding a "Help" icon to each pull-out menu as the Petition suggests would have only layered one or more steps onto Hisatomi's solution for executing the Help function. A POSA would have viewed Hisatomi's solution as better adapted to its interface, which relies on pull-out menus like the drawers of a desk. It follows that a POSA would not have been motivated to change the device by incorporating Allard-656.

134. Dr. Bederson also states that a "POSA would have understood that the teachings of Allard-656 address the same issues discussed in Hisatomi and solve the same problem in a manner that would provide benefits when working with smaller screen sizes" EX1002, ¶169. However, this is not true – the problem

addressed by Allard-656 (how to adjust contrast of a user interface on a display screen when the user interface cannot be displayed) was fundamentally different from that addressed by Hisatomi (how to enable image editing work on a display while providing simultaneously displaying a menu). EX1005, ¶0005-06.

**C. Ground 1C: Claim 5**

135. Claim 5 recites “[t]he computer readable medium of claim 1, wherein the plurality of pre-designated system functions comprises a clock function.” Dr. Bederson relies on the combination of Hisatomi and a “World Clock” icon from Tanaka for this disclosure. But he does not disclose a motivation for a POSA to modify Hisatomi to add Tanaka’s icon.

136. Dr. Bederson argues that a POSA would have been motivated to include a clock function “because the ability to identify the current time as well as the passage of time without viewing a separate device was desirable across the variety of devices in which Hisatomi teaches its device could be implemented.” EX1002, ¶175. This argument may speak to a motivation to add a clock function, but it provides no motivation for a POSA to add a clock icon within a menu of system functions of the ‘993 Patent, as opposed to a persistent clock display on the screen. A POSA would have viewed requiring a user to activate an icon to see the time as an inferior solution to a persistent clock display in the Hisatomi device. In fact, in 2002, a POSA would have known that the persistent clock display was the

typical solution in 2002 (and today) for notebook-sized devices such as Hisatomi, as well as the “variety of devices” referenced by Dr. Bederson.

137. The Petition argues also that Hisatomi discloses off-screen function lists, and “describes the desire to not obscure the image on the editing screen, as would have been required to always display a clock” (Pet., p. 58). But a POSA would have understood that a persistent clock display does not “require” obscuring the displayed image. Hisatomi discloses that its user interface may be applied to “a still camera, a video camera, a notebook computer, a head mounted display, a car navigation system, or the like.” EX1005, ¶0243. In all of these devices, which also display images, a clock function is typically implemented with a small persistent clock display. Even Bederson admits that his clock function could be “persistent at the edge of the screen or in the form of an icon.” EX1002, ¶173.

138. Dr. Bederson also contends that it “would have been within the level of ordinary skill to implement a well-known function such as a clock icon with predictable results, particularly given its ubiquity in the art.” EX1002, ¶176. However, the “ubiquity” of a clock icon is not the salient point – the question is whether a POSA would have seen a reason to implement a clock function within Hisatomi’s device as an icon rather than the more typical persistent display. Dr. Bederson does not address that point.

139. Dr. Bederson also points to a page from a Palm manual that appears to show a “Clock” icon. However, this adds nothing to Tanaka’s icon, so my comments above apply equally to the Palm icon.

140. For these reasons, to the extent that a POSA in 2002 was motivated to implement a clock functionality on Hisatomi’s device, she would have done so as a persistent display on the edge of the screen rather than in the form of an icon.

**D. Ground 1D: Claim 6**

141. Claim 6 recites “[t]he computer readable medium of claim 1, wherein the plurality of pre-designated system functions comprises an alarm function.” Dr. Bederson proposes the combination of Hisatomi and Ren with Kodama, but does not show any deficiency in Hisatomi or a motivation to modify it to add an alarm icon.

142. Hisatomi was directed to a device for taking, processing and saving images (such as photographs). A POSA in 2002 would have seen no reason to add an alarm functionality to such a device. To the extent that time management was seen as a problem to be addressed by a camera device like Hisatomi’s, it could have been addressed by a persistent clock display. There would be no motivation for a POSA to further modify Hisatomi to add an alarm.

143. Dr. Bederson’s sole proffered reason for adding an alarm function as one of Hisatomi’s icons is that it would have been desirable to have an alarm that a

user could set to manage the amount of time spent on editing functions. EX1002, ¶181. This is a surprising rationale; a POSA in 2002 (and today) would not have considered it important to add an alarm function to a device like Hisatomi's for such a reason, since there were other means of tracking a user's time – such as a persistent clock display on the device, or even an alarm function on a user's digital wristwatch or standalone clock – that would have been considered more than sufficient for this purpose.

144. More fundamentally, the notion that it would have been desirable to add an alarm function to Hisatomi's device so a user could know the exact amount of time spent on specific editing functions does not accurately reflect how a user would likely have utilized a photo editing device like Hisatomi. A POSA would not have considered it beneficial to add an alarm functionality to Hisatomi to address a need to track photo editing time because it would not have been considered likely to be seen by users as useful.

145. In addition, Dr. Bederson's rationale reflects hindsight bias, driven by our modern experience with smartphones. In 2002, before smartphones that incorporated "lifestyle" functionalities such as photo editing, neither a POSA nor the average consumer would have considered it beneficial to package an alarm with an image editing device. The same is true of the additional implementations listed at Hisatomi's paragraph 243. In my opinion, a POSA would not have



regarded the lack of an alarm on any of these devices would not have been considered a “deficiency” to be remedied.

**E. Ground 2A: Claims 1-3, 7 and 8**

**1. Claim 1**

**a. Hansen Does Not Disclose an “Electronic Device” as Recited in the Preamble (Limitation 1[pre])**

146. The preamble to claim 1 recites: “A non-transitory computer readable medium storing instructions, which, when executed by a processor of an electronic device having a touch-sensitive display screen, cause the processor to enable a user interface of the device, the user interface comprising at least two states, . . . .”

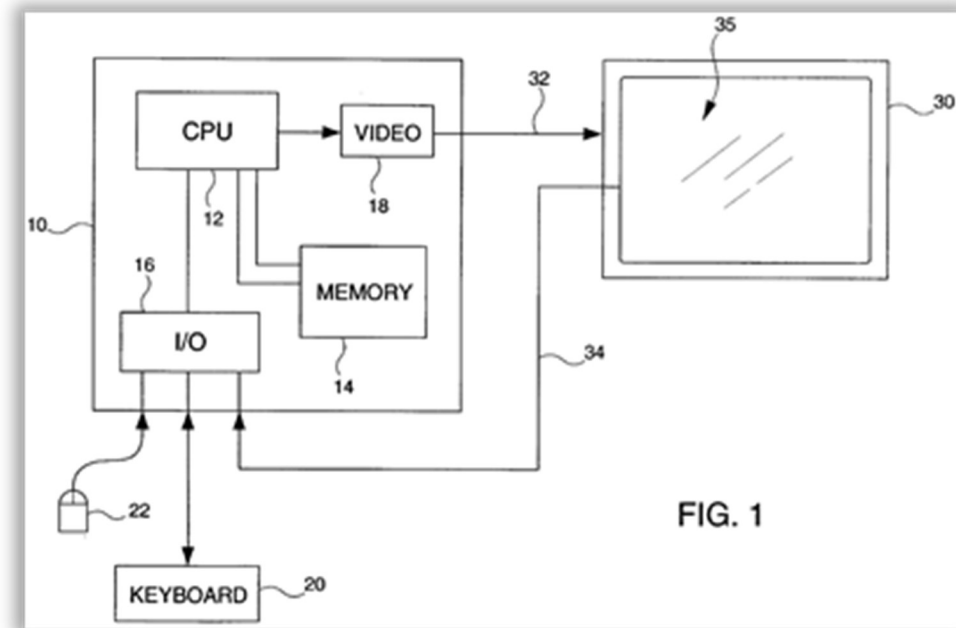
EX1001, 6:50-54.

147. Hansen discloses a method “for generating a working window in a computer system having a video monitor with a touch-sensitive screen operable to generate electrical signals corresponding to user input strokes thereon.” EX1029, 2:25-31. Dr. Bederson cites to Hansen, EX1029, 3:49-4:25, for the “processor of an electronic device having a touch-sensitive display screen.” EX1002, ¶183.

However, Hansen does not disclose this element.

148. The Hansen method is performed by a conventional desktop computer system, comprising a computer board having a central processing unit (CPU), an input/output port, and a video controller. EX1029, 3:51-54. Input devices include an external keyboard and mouse. *Id.*, 3:54-57. The display is an external

conventional video monitor coupled to the computer board's video controller by a lead. *Id.*, 4:10-13. Figure 1 of Hansen illustrates the components of such a system:



EX1029, FIG 1.

149. In Hansen's Figure 1, Element 10 is a computer board "which includes a Central Processing Unit (CPU) 12, a memory unit 14, an input/output port 16 and a video controller 18." EX1029, 3:51-54. Element 30 is the video monitor, and "the video monitor 30 is equipped with a touch-sensitive screen 35, which overlays the video monitor." *Id.*, 4:8-10. The touch-sensitive screen is coupled to the input/output port by a lead 34, which carries an electrical signal that "is read by the CPU 12 to produce an X,Y signal that indicates where a user has touched the touch-sensitive screen 35." *Id.*, 4:15-19. Hansen provides an example

of the touch-sensitive screen 35 (EX1029, 4:20-23), the “Mac-n-Touch” made by the Micro-Touch company, shown below:



EX2003 (Copyright 1988).

150. In Hansen, the CPU, video monitor, and touch-sensitive screen are three distinct electronic devices. The “electronic device” with the processor disclosed in Hansen, the CPU, does not have a touch-sensitive display screen, and the “touch-sensitive display” disclosed in Hansen does not have a processor. Rather, the electronic device with the processor, the CPU, is connected by leads to a separate display monitor and a separate touch-sensitive overlay, similarly to the separate mouse and keyboard shown in Figure 1. This is a fundamentally different architecture from what is recited in the preamble to claim 1.

151. For at least the foregoing reasons, Hansen does not disclose “a processor of an electronic device having a touch-sensitive display screen.”

**b. Hansen does Not Disclose Icons for a Plurality of System Functions (Limitation 1[b])**

152. Dr. Bederson asserts that the icons A-H illustrated in Figure 3B, above, are a “plurality of pre-designated system functions.” EX1002, ¶187. I disagree; these icons are icons for applications, not system functions.

153. Hansen discloses that “[t]he plurality of icons correspond to a plurality of computer programs.” EX1029, 2:45-47; 5:17-20. “After the user has selected one of the plurality of icons,” the processing displays a “working window,” and “continues with the step of executing the computer program corresponding to the icon selected by the second user input stroke ....” EX1029, 7:66-8:6; Fig 4A. In other words, touching one of the icons opens a corresponding application.

154. A POSA would have understood that the “plurality of computer programs” selected by the user and executed in Hansen are applications, for at least the following reasons. First, Hansen states that the working window opened by touching an icon is for an “application program.” EX1029, 6:30-33. Second, there is no reference anywhere in Hansen to an icon for activating anything that a POSA would associate with a system function. Third, even without Hansen’s explicit

disclosure that the working window is for an application program, a POSA would have read Hansen as referring to applications, not system functions, because the “working window” of Hansen is for an application.

155. Dr. Bederson asserts that “a POSA would have understood a computer program to be at least one type of ‘system function.’” EX1002, ¶187. This is incorrect in the context of Hansen, which specifically refers to the programs as “application program[s].” A POSA would not have understood Hansen’s computer program to be a type of “system function.”

156. For at least the reasons stated above, a POSA would understand that Hansen does not disclose “icons for a respective plurality of pre-designated system functions.”

**c. Hansen Does Not Disclose a Tap-Absent State (Limitation 1[c])**

157. Claim 1 recites “a tap-absent state, wherein tap-activatable icons are absent.” EX1001, 6:58-59. Dr. Bederson contends that Hansen discloses a tap-absent state; I disagree.

158. A POSA would understand that Hansen discloses a desktop system implemented on a standard windows-based platform. Hansen repeatedly refers to typical prior art windows that are open on the display of his system, both before a “working window” is opened and after it is closed. EX1029, 5:9-17, 6:34-37, Figs.

3A, 3B. As a POSA would know, such windows typically include a title bar containing at least tap-activatable icons to minimize, maximize and close the window. This is reflected, for example, in the prosecution file; a POSA would understand and agree with the argument made by the applicant to distinguish Hansen on this basis:

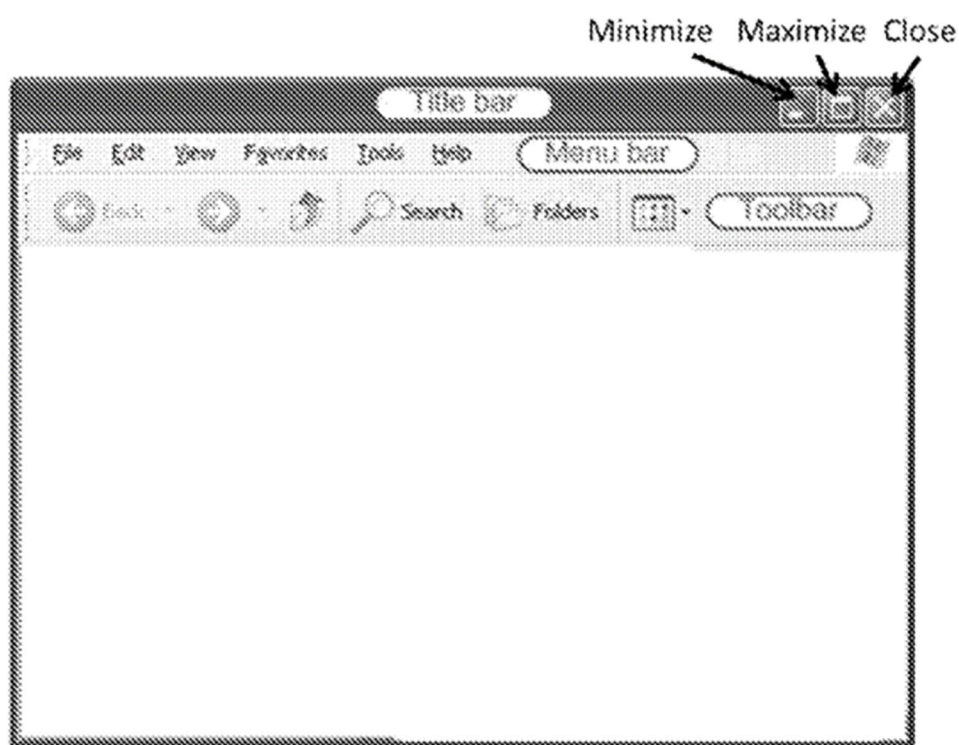
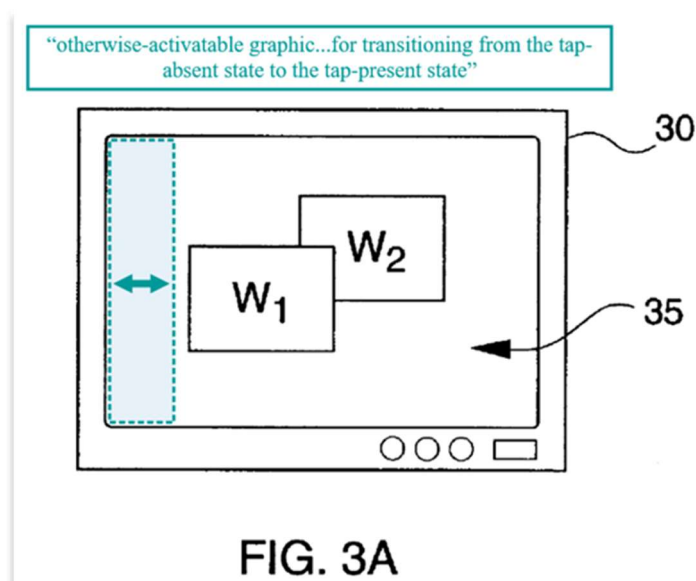


FIG. 1: standard window components

EX1003, at 156-57. While Dr. Bederson asserts that Hansen discloses a tap-absent state, he relies on Figure 3A, which expressly discloses windows (W1 and W2) on the Hansen display, thereby proving the opposite. For at least these reasons, a POSA would understand that Hansen does not disclose a tap-absent state.

**d. A POSA Would Not have been Motivated to Incorporate an “Otherwise Activatable Graphic” Into Hansen’s Display (Limitation 1[c])**

159. Claim 1 recites “an otherwise activatable graphic” that “is present in a strip along at least one edge of the display screen.” Dr. Bederson acknowledges that Hansen does not disclose the recited graphic, but argues that a POSA would have been motivated to modify Hansen to define Hansen’s “predetermined area” with dashed lines, a contrasting color, and an inserted double-arrow graphic:



EX1002, ¶193. I disagree. In fact, a POSA would have had no motivation to alter Hansen in the manner proposed by Dr. Bederson, and would have had several reasons not to do so.

**Incorporating Bederson's "Affordance" Would have Undermined Hansen's**

**Intent to Avoid Cluttering the Workspace**

160. In 2002, it was considered desirable in the field of user interface design to minimize the clutter presented on the display. This manifested in the desktop monitor world as an imperative to, e.g., present alternatives to on-screen icons and move icons out of the display workspace. Hansen's teachings are consistent with this, such as where Hansen notes that "it is desirable to have an operating system where the user can easily eliminate extra windows that appear on a computer so that the screen does not become cluttered," EX1029, 2:11-14, and touts that an advantage of the disclosed system is that "the method of the present invention does not clutter the screen by producing numerous haphazardly placed windows on the screen," thereby enabling the user to "more easily concentrate on the application program that is being run." EX1029, 6:28-34.

161. Dr. Bederson's proposed modification is exactly contrary to the teaching and cited advantages of Hansen; it clutters the screen with a useless graphic and reduces the space in which the user may concentrate on the running application. Hansen also stresses the advantage of providing a working window that overlaps most of the monitor, and of being able to *remove* the working window from the display so that the display is not cluttered. EX1029, 6:30-37. Hansen teaches away from this modification, and Hansen's denigration of screen



clutter informs a POSA that it would have detrimental to add Dr. Bederson's graphic to Hansen's display.

**Incorporating Bederson's "Affordance" Would have Provided No Benefit to Hansen**

162. A POSA as of 2002 would have understood that a user would find Dr. Bederson's graphic to be distracting and unnecessary, for at least two reasons. First, desktop touchscreens were very unusual in 2002 (and are still not commonly used today). A user of a system such as Hansen's in 2002 would likely have been an experienced, early-adopting computer user who was willing to pay a premium for more advanced equipment and had performed substantial research regarding the novel desktop touchscreen display of the Hansen system, including how to operate it using gestures on the touchscreen. Accordingly, a POSA would have seen no benefit to adding an "affordance" to Hansen's display.

163. Second, to the extent that a POSA would have considered it important to accommodate a hypothetical novice user, it could more easily and cheaply have been done in 2002 via an owner's manual, and in any event would have been unnecessary following the first few uses of the system. This would have been considered preferable to further cluttering Hansen's screens with graphics, since a POSA would have known that instructional materials would be distributed with the

system. And, even Dr. Bederson's "affordance" would have had to be explained to a novice user in, e.g., an owner's manual.

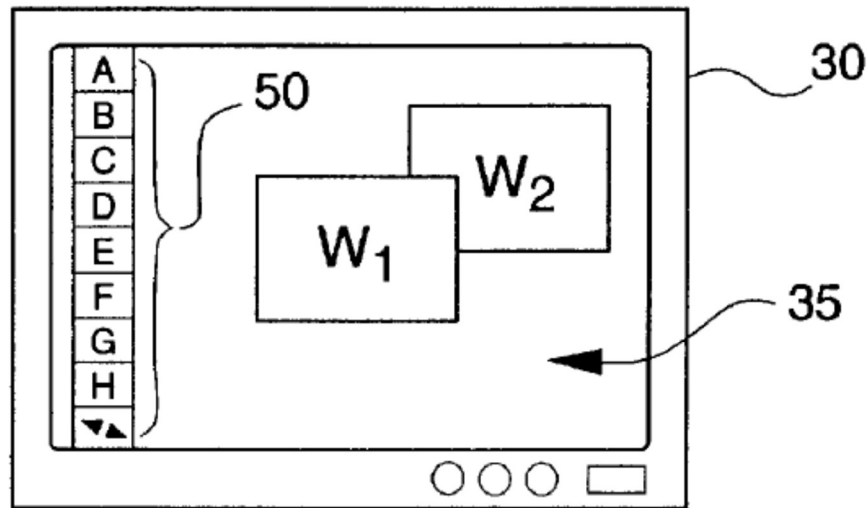
164. So, a POSA would have seen no benefit to adding Dr. Bederson's "affordance," and would have cluttered Hansen's screen by doing so. A POSA would have seen no motivation to modify Hansen in such a manner.

## **2. Claim 3**

165. Claim 3 recites "[t]he computer readable medium of claim 1, wherein the tap-present state does not display the tap-activatable icons within a window frame." As I have stated above, Hansen fails to disclose the "electronic device" of the preamble, tap-activatable icons for system functions, a tap-absent state or an otherwise activatable graphic in the tap-absent state. That and the lack of any motivation for a POSA to combine Hisatomi and Gillespie indicate that Claim 3 is not rendered obvious by Dr. Bederson's cited art.

166. In addition, Hansen does not disclose the specific content of claim 3. Petitioners rely on Hansen for disclosure of the elements of Claim 3, arguing that the "tap-activatable icons" not displayed "within a window frame" are shown as the icon block 50 in Hansen's Figure 3B.

167. A POSA would understand that the icons of Hansen are presented within a window frame. This is clear from Figure B and the text describing it:



**FIG. 3B**

168. In describing what is shown in Figure 3B, Hansen states that the icons are displayed if the user executes a “first predetermined user input stroke, i.e., a swipe from the left edge of the screen. EX1029, 5:14-17. Hansen then states that the “working window” also “appears on the screen 35 as a result of the user performing the first predetermined input stroke.” EX1029, 5:17-20.

169. A POSA would also consider the following text relevant:

Consequently, the user always has access to a working window that appears to the user to be disposed adjacent a left-hand side of the video monitor. The user can pull the working window onto the video monitor at any time by performing the first predetermined user input stroke . . . .

EX1029, 6:10-15.

170. So, a POSA would understand that Figure 3B, which shows the display after the user has input the first predetermined user input stroke, includes the working window. A POSA would further understand that the working window encloses the icons A-H, because the icons are disposed adjacent the left side of the monitor (where Hansen describes the working window being located) in a block that occupies only a portion of the display and because the opposing arrowheads at the bottom of the icon block indicate that a user can scroll the icon block up or down, showing that the icon block is in its own workspace independent of what is shown on the rest of the display and can be separately manipulated similarly to clicking on a “minimize” or “enlarge” icon on a standard desktop window. This informs a POSA that the icons 50 of Hansen are displayed within a window frame.

### **3. Claims 2, 7-8**

171. I understand that claims 2, 7 and 8 include all of the limitations of claim 1, in addition to the elements they specifically recite. Therefore, my analysis, opinions and conclusions concerning claim 1 apply to the same extent with respect to claims 2, 7 and 8.

### **F. Ground 2B: Claim 4**

172. Claim 4 recites “[t]he computer readable medium of claim 1, wherein the plurality of pre-designated system functions comprises a help function.” Dr. Bederson asserts that Hisatomi discloses function lists, and that it would have been

obvious to a POSA to include a Help function because it is among “a handful of common and typical functions a POSA would have known to include, or at least would have been obvious to try, in a user interface ....” Pet., p. 55. He then points to the disclosure of a Help function in Allard-656 as evidence that a Help function was well-known. *Id.*

173. I have already explained, at paragraphs 117-26, why a POSA would not have considered Allard-656 to be in the same field of endeavor as the ‘993 Patent, and would not have considered it pertinent to the problem the ‘993 Patent inventor sought to solve.

174. In addition, a POSA would not have been motivated to incorporate Allard-656’s Help icon into the Hansen system. Hansen was a desktop implementation in which a Help function would have been presented via a drop-down text ribbon at the top of the display, as was common at the time and still today. And Dr. Bederson’s assertion that Hansen and Allard-656 “are both directed to pen input on a touch user interface of a handheld device” and that Allard-656 “address[es] the same issues discussed in Hansen and solve the same problem” EX1002, ¶212, is incorrect; as shown above, Allard-656 is not directed to input on a touch surface, but rather to configuring a touch surface using mechanical buttons, and does not address the same issues as Hansen.

**G. Ground 2C: Claim 5**

175. Claim 5 recites “[t]he computer readable medium of claim 1, wherein the plurality of pre-designated system functions comprises a clock function.” Dr. Bederson relies on the combination of Hansen and the World Clock icon of Tanaka for this disclosure.

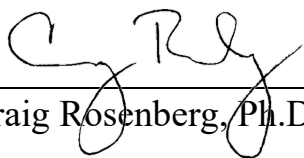
176. Dr. Bederson states that it would have been desirable for Hansen’s icons to include an icon for a clock function because “nearly every user interface” includes a clock function “in some form, whether persistent at the edge of the screen or in the form of an icon” EX1002, ¶215. However, the fact that it was well known to include a clock function as a persistent numerical display at the edge of the display – which was in 2002, and is today, the dominant presentation of a clock function on a desktop implementation such as Hansen’s – indicates that a POSA would have seen no deficiency in Hansen that would have been remedied by adding a clock icon to icon list 50. In fact, adding a redundant clock icon to Hansen’s display would have cut against Hansen’s push to render an uncluttered workspace, and would have been inferior to a persistent display edge presentation as a solution to the “problem” Dr. Bederson identifies. For at least these reasons, a POSA would have seen no reason to add Tanaka’s clock icon to Hansen’s display.

**H. Ground 2D: Claim 6**

177. Claim 6 recites “[t]he computer readable medium of claim 1, wherein the plurality of pre-designated system functions comprises an alarm function.” A POSA would have seen no reason to add an alarm icon to Hansen’s display for the reasons, among others, that Hansen sought to de-clutter the desktop rather than add to it, and that an alarm function could easily have been incorporated via a drop-down menu without adding to desktop clutter.

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

Dated: September 22, 2021

  
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Craig Rosenberg, Ph.D.