

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.;
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner

v.

SLYDE ANALYTICS, LLC
Patent Owner.

**DECLARATION OF BENJAMIN B. BEDERSON
IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 9,651,922**

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I. INTRODUCTION

1. I have been retained by Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, “Samsung” or “Petitioner”), as an independent expert in this proceeding before the Patent Trial and Appeal Board (“PTAB” or “Board”). I understand that Samsung is requesting that the Board institute an *inter partes* review (“IPR”) proceeding of U.S. Patent No. 9,651,922 (“the ’922 Patent”) (Ex-1001), currently assigned to Slyde Analytics LLC (“Patent Owner” or “PO”).

2. I am not and have never been an employee of Samsung. I am being compensated at my usual and customary rate of \$600 per hour. No part of my compensation depends on the outcome of this proceeding, and I have no other interest in this proceeding.

3. I have been asked to provide my independent analysis of the ’922 Patent in light of the prior art publications cited below. I have also been asked to consider the state of the art and prior art available as of July 3, 2009. Based on the prior art discussed in this declaration, it is my opinion that Claims 1-24 of the ’922 Patent are unpatentable for the reasons provided below.

A. Qualifications

4. I am currently Professor Emeritus of Computer Science at the University of Maryland (“UMD”). From 2014 to 2018, I was the Associate Provost

of Learning Initiatives and Executive Director of the Teaching and Learning Transformation Center at UMD. I am a member and previous director of the Human-Computer Interaction Lab (“HCIL”), the oldest and one of the best known Human-Computer Interaction (“HCI”) research groups in the country. I am the co-founder of the J.S. Bryant School, a therapeutic high school planned to open in 2025. I was also co-founder and Chief Scientist of Zumobi, Inc. from 2006 to 2014, a Seattle-based startup that is a publisher of content applications and advertising platforms for smartphones. I am also co-founder and co-director of the International Children’s Digital Library (“ICDL”), a web site launched in 2002 that provides the world’s largest collection of freely available online children’s books from around the world with an interface aimed to make it easy for children and adults to search and read children’s books online. I am also cofounder and Chief Technology Officer of Hazel Analytics, a data analytics company to improve food safety and better public health whose product sends alerts in warranted circumstances. In addition, I have for more than 25 years consulted for numerous companies in the area of user interfaces, including Hillcrest Labs, Lockheed Martin, Logitech, Microsoft, NASA Goddard Space Flight Center, the Palo Alto Research Center, and Sony.

5. For more than 30 years, I have studied, designed, and worked in the field of computer science and Human-Computer Interaction (HCI). My experience includes 30 years of teaching and research, with research interests in HCI and the

software and technology underlying today's interactive computing systems. This includes the design and implementation of hardware and software systems including graphical user interfaces with capacitive and other touch screen sensors, and interactive applications on a range of devices, including embedded systems, controllers, smart phones and PDAs.

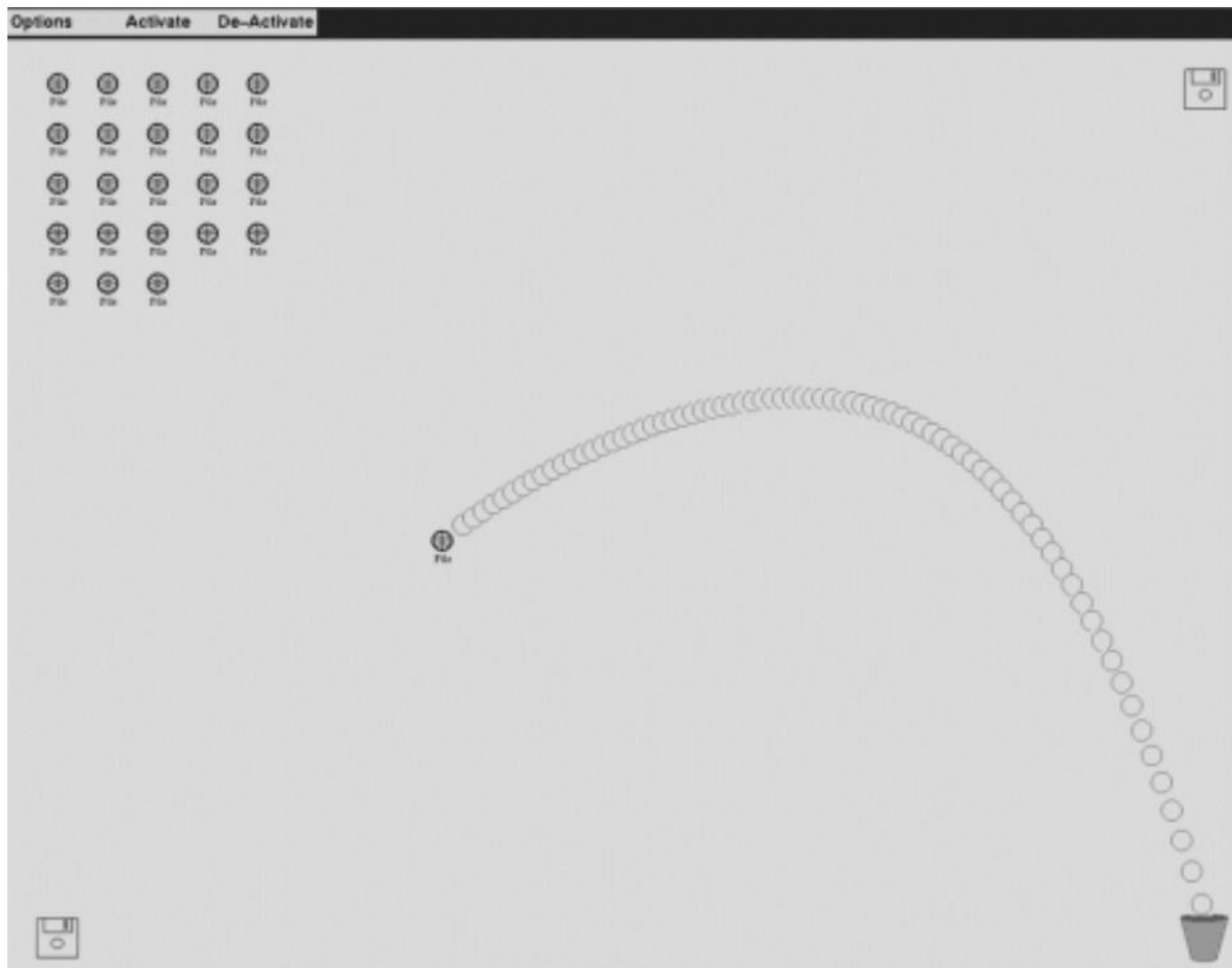
6. At UMD, I am focused primarily on the area of HCI, a field that relates to the development and understanding of computing systems to serve users' needs. Researchers and practitioners in this field are focused on making universally usable, useful, efficient, and appealing systems to support people in their wide range of activities. My approach is to balance the development of innovative technology that serves people's practical needs. Example systems following this approach that I have built include Cortex-I (1992 embedded computer vision system that sensed licensed plates with custom motor, camera and controller), Audio Augmented Reality (1995 embedded system for sensing a user's location and playing audio suited to that location), Fisheye Menus (2000 software for sensing movement within and selection of linear list of items in a menu), PhotoMesa (2001 software for end users to browse personal photos), DateLens (2002 software for end users to use their mobile devices to efficiently access their calendar information), SlideBar (2005 linear sensor to control scrolling), LaunchTile (2005 "home screen" software for mobile devices to allow users to navigate apps in a zoomable environment),

SpaceTree (2001 software for end users to efficiently browse very large hierarchies), ICDL (as described above), and StoryKit (a 2009 iPhone app for children to create stories).

7. Throughout the 1990s and 2000s, I worked on a range of “zoomable user interfaces,” which are systems that support the multi-scale and spatial organization of and magnification-based navigation among multiple documents or visual objects. I built several different “ZUI” systems over the years, including Pad++, Jazz and Piccolo. In those systems, I used a range of solutions to allow users to control zooming through the information space. The most common approach for systems with three button mice was to use the middle button for zooming in and the right button for zooming out. *See* Ex-1023, p. 18. The user would hold the button down, and the system would smoothly animate zooming in or out – so that the user controlled how much the system zoomed based on the duration that the button was pressed. *See id.*, pp. 20, 22.

8. In 1995 and 1996, I supervised graduate student David Rogers and other students in the development of a user interface approach that allowed a user to “toss” an object across long distances on their screen with their mouse. *See* Ex-1024, p. 1. Motivated by increasingly large computer screens, we recognized a need to help users move items long distances without necessarily having to drag the item that entire distance manually. *See id.* Instead, we calculated the speed and direction

that the user dragged an object with their mouse. When a user released the mouse button, if the speed was greater than a threshold, our code calculated the path of where to animate the object based on several factors including the speed and direction of the mouse at the time of mouse button release. The figure below from a paper we wrote in 1996 shows the path of a tossed object. This resulted in David Rogers's master's thesis in 1995 and a paper that we submitted to the 1996 Conference on Human Factors in Computing Systems (CHI 1996).



Exemplar Figure of Tossing.

9. In 1999 and 2000, I worked on a mechanism to address the challenge that users faced when selecting one item from a long menu. As I described in a paper entitled “Fisheye Menus” that I published in the 2000 Proceedings of the ACM Symposium on User Interface Software and Technology, existing techniques typically involved lengthy and slow scrolling techniques. *See* Ex-1025, p. 8. I created an alternative solution that fit all of the elements onto a single screen thereby completely eliminating the need to scroll. *See id.*, p. 1. This approach used the concept of “fisheye distortion” to shrink some of the elements, while keeping the elements that are under the cursor to be full size so the user could easily see and select them. *See id.* This approach as depicted in the figure below and described further in the paper, was later used in a number of commercial products such as the Apple MacOS Dock.

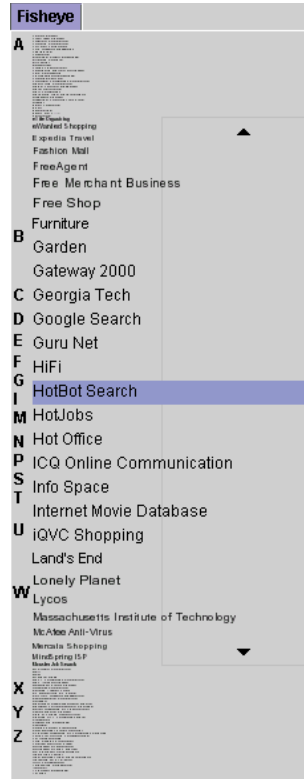


Figure 2

10. Starting in 2000, I supervised graduate student Leslie Chipman who was working on a general solution to improve the user experience of people scrolling long documents on computers. Our solution relied on a passive haptic physical linear input device we called the “Slidebar.” See Ex-1026, p. 1. The Slidebar was designed to sit on either side of the keyboard to be used with the non-dominant hand for scanning and rough positioning, and then if the user wanted to switch to reading, the dominant hand could be used for more accurate positioning. See *id.* With a physical range of motion of approximately two inches, the full range could be accessed by moving just the fingers without moving the entire hand. See *id.* This

took advantage of human proprioception—the fact that people have excellent ability to know where their body is—and allowed the user to scroll long documents completely eyes-free. *See id.*, p. 4. They did not need to look at the device or the screen to, for example, move a mouse pointer to a graphical scroll bar. Instead they could focus on their primary task of reading. This work was published in 2004.

11. In April 2000, I visited Professors Wayne Westerman and John Elias at the University of Delaware and gave a talk entitled “Zoomable User Interfaces and Single Display Groupware.” This resulted in a collaboration with Professor Westerman, graduate student Hilary Browne, and others where we used their FingerWorks capacitive Multi-Touch Surface as the input device for a multi-touch finger painting program for children. *See Ex-1027*, p. 1. The project used this input device to support a computer painting program that allowed children to paint with their fingers by directly touching the sensing surface. In contrast to the mouse input more typically used in this time period, this approach enabled us to create a more natural interaction environment. *See id.* This work, depicted in the figure below, was published in a September 2000 technical report.



Figure 1

12. Throughout the 2000s, I worked on a range of interfaces for mobile devices with a focus on interface design for touch interfaces, including those with capacitive sensors. During this period, it became apparent that some positions on a screen were easier to access than others, especially when used with a single hand. To understand this issue, I led a range of studies that resulted in two papers published in 2006¹ and 2007². The following figure summarizes the results of one of the studies, and shows that generally speaking, when using a single hand, the center of

¹ Ex-1028 (Pekka Parhi, Amy K. Karlson, and Benjamin B. Bederson. 2006. *Target size study for one-handed thumb use on small touchscreen devices*. In *Proceedings of the 8th Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI '06)*. Association for Computing Machinery, New York, NY, USA, 203–210. DOI:<https://doi.org/10.1145/1152215.1152260>).

² Ex-1029 (Karlson, Amy & Bederson, Benjamin & Contreras-Vidal, José. (2007). *Understanding One-Handed Use of Mobile Devices*. *Handbook of Research on User Interface Design and Evaluation for Mobile Technology*. 86-101. DOI:10.4018/978-1-59904-871-0.ch006).

the screens were easier for users to touch than the edges of the screen, and that the corners of the screen were the hardest positions to touch.

Table 2. Preference and movement time maps for each device. Depth of color in columns 1 and 2 indicate stronger user agreement.

	Subjective Difficult Regions	Subjective Easy Regions	Preference -Derived Regions Easy — Medium — Hard —	Data- Derived Regions Fastest — Slowest —
SMALL				
FLIP				
LARGE				
PDA				

Ex-1029, Table 2.

13. This work on touch screen mobile devices led to my creation of Zumobi in 2006, where I was responsible for investigating new software platforms and developing new user interface designs that provide efficient and engaging interfaces

to permit end users to access a wide range of content on mobile platforms (including the iPhone and Android-based devices). For example, I designed and implemented software called “Ziibii,” a “river” of news for iPhone that used a capacitive sensor for controlling linear movement through news; software called “ZoomCanvas,” a zoomable user interface for several iPhone apps; and iPhone apps including “Inside Xbox” for Microsoft and Snow Report for REI. At the ICDL, I have since 2002 been the technical director responsible for the design and implementation of the web site, www.childrenslibrary.org (originally at www.icdlbooks.org). In particular, I have been closely involved in designing the user interface as well as the software architecture for the web site since its inception in 2002.

14. Beginning in the mid-1990s, I have been responsible for the design and implementation of numerous other web sites in addition to the ICDL. For example, I designed and built my own professional web site when I was an Assistant Professor of Computer Science at the University of New Mexico in 1995 and have continued to design, write the code for, and update both that site (which I moved to the UMD in 1998, currently at <http://www.cs.umd.edu/~bederson/>) as well as numerous project web sites, such as Pad++, <http://www.cs.umd.edu/hcil/pad++/>. I received the Janet Fabri Memorial Award for Outstanding Doctoral Dissertation for my Ph.D. work in robotics and computer vision. I have combined my hardware and software skills throughout my career in HCI research, building various interactive electrical

and mechanical systems that couple with software to provide an innovative user experience.

15. My work has been published extensively in more than 160 technical publications, and I have given about 100 invited talks, including 9 keynote lectures. I have won a number of awards including the Brian Shackel Award for “outstanding contribution with international impact in the field of HCI” in 2007, and the Social Impact Award in 2010 from the Association for Computing Machinery’s (“ACM”) Special Interest Group on Computer Human Interaction (“SIGCHI”). ACM is the primary international professional community of computer scientists, and SIGCHI is the primary international professional HCI community. I have been honored by both professional organizations. I am an “ACM Distinguished Scientist,” which “recognizes those ACM members with at least 15 years of professional experience and 5 years of continuous Professional Membership who have achieved significant accomplishments or have made a significant impact on the computing field.” I am a member of the “CHI Academy,” which is described as follows: “The CHI Academy is an honorary group of individuals who have made substantial contributions to the field of HCI. These are the principal leaders of the field, whose efforts have shaped the disciplines and/or industry, and led the research and/or innovation in human-computer interaction.” The criteria for election to the CHI Academy are: (1) cumulative contributions to the field; (2) impact on the field

through development of new research directions and/or innovations; and (3) influence on the work of others. I have received two “Test of Time” awards from IEEE InfoVis for my 2001 and 2002 work on visualizing hierarchies, including those containing digital photos.³

16. I have appeared on radio shows numerous times to discuss issues relating to user interface design and people’s use and frustration with common technologies, web sites, and mobile devices. My work has been discussed and I have been quoted by mainstream media around the world over 120 times, including by the New York Times, the Wall Street Journal, the Washington Post, Newsweek, the Seattle Post Intelligencer, the Independent, Le Monde, NPR’s All Things Considered, New Scientist Magazine, and MIT’s Technology Review.

17. I have designed, programmed, and publicly deployed dozens of user-facing software products that have cumulatively had millions of users. My work is cited by several major companies, including Amazon, Apple, Facebook, Google, and Microsoft. I am a named inventor on 14 U.S. patents and 20 U.S. patent applications. The patents are generally directed to user interfaces/experience.

18. I am over 18 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth herein. I understand that a copy of

³ See Ex-1030; Ex-1031

my current curriculum vitae, which details my education and professional and academic experience, is being submitted by Petitioner as Exhibit 1003. The following provides an overview of some of my experience that is relevant to the matters set forth in this declaration.

19. I received a B.S. degree in Computer Science with a minor in Electrical Engineering in 1986 from the Rensselaer Polytechnic Institute. I received M.S. and Ph.D. degrees in Computer Science in 1989 and 1992, both from New York University.

20. Based on my experience and education, I believe that I am qualified to opine as to the knowledge and level of skill of one of ordinary skill in the art at the time of the alleged invention of the '922 Patent, as well as the state of the art at that time.

B. Materials Considered

21. In forming my opinions, I reviewed the following documents, in addition to others I have cited in my declaration. I also relied on my own knowledge of and experience in the field of touch-screen interfaces for electronic devices.⁴

Ex. No.	Description
Ex-1001	U.S. Patent No. 9,651,922 (“the '922 Patent”)

⁴ Four-digit pin citations that begin with 0 are to the branded numbers added by Samsung in the bottom right corner of the exhibits. All other pin citations are to original page, column, paragraph, or line numbers.

Ex. No.	Description
Ex-1002	Declaration of Dr. Benjamin Bederson
Ex-1003	Curriculum Vitae of Dr. Benjamin Bederson
Ex-1004	Prosecution History of the '922 Patent (Application No. 13/334,823)
Ex-1005	U.S. Patent Application Publication No. 2008/0168368 (“Louch”)
Ex-1006	U.S. Patent Application Publication No. 2006/0097991 (“Hotelling”)
Ex-1007	U.S. Patent No. 6,449,219 (“Hepp”)
Ex-1008	Linux Watch, https://researcher.watson.ibm.com/researcher/view_group_subpage.php?id=6102 (last visited Sept. 29, 2023).
Ex-1009	U.S. Patent No. 4,165,575 (“Neilsen”)
Ex-1010	U.S. Patent No. 8,296,684 (“Duarte”)
Ex-1011	U.S. Patent Application Publication No. 2008/0062207 (“Park”)
Ex-1012	U.S. Patent No. 6,714,486 (“Biggs”)
Ex-1013	Howard Anton, Calculus (2nd ed. 1984)
Ex-1014	U.S. Patent No. 8,344,998 (“Fitzgerald”)
Ex-1015	Haptic, https://www.merriam-webster.com/dictionary/haptic (last visited Sept. 27, 2023).
Ex-1016	Active-matrix liquid-crystal display, https://en.wikipedia.org/wiki/Active-matrix_liquid-crystal_display (last visited Sept. 27, 2023).
Ex-1017	Display device, https://en.wikipedia.org/wiki/Display_device (last visited Sept. 27, 2023).
Ex-1018	Palm (PDA) https://en.wikipedia.org/wiki/Palm_(PDA) (last visited Sept. 27, 2023).

Ex. No.	Description
Ex-1019	U.S. Patent Application Publication No. 2009/0199241 (“Unger”)
Ex-1020	Claim Mapping Table
Ex-1021	Chandra Narayanaswami et al., IBM’s Linux Watch: The Challenge of Miniaturization 33-41 (2002).
Ex-1022	U.S. Patent Application Publication No. 2009/0199130 (“Tsern”)
Ex-1023	Benjamin B. Bederson & James D. Hollan, Pad++: A Zooming Graphical Interface for Exploring Alternate Interface Physics 17-26 (1994).
Ex-1024	David Rogers, Feimo Hou, Chandelle Vuolo & Benjamin B. Bederson, Tossing Objections in a Desktop Environment (1996).
Ex-1025	Benjamin B. Bederson, Fisheye Menus 217-225 (2000)
Ex-1026	Leslie E Chipman, Benjamin B. Bederson & Jennifer A. Golbeck, SlideBar: Analysis of a linear input device 1-9 (2004).
Ex-1027	Hilary Browne et al., Designing a Collaborative Finger Painting Application for Children (2000).
Ex-1028	Pekka Parhi, Amy K. Karlson & Benjamin B. Bederson, Target Size Study for One-Handed Thumb Use on Small Touchscreen Devices 203-210 (2006).
Ex-1029	Amy K. Karlson, Benjamin B. Bederson & José Contreras-Vidal, Understanding One-Handed Use of Mobile Devices 1-22 (2007).
Ex-1030	Test of Time Awards, https://ieevis.org/year/2021/info/awards/test-of-time-awards (last visited Oct. 3, 2023).
Ex-1031	Test of Time Awards, https://ieevis.org/year/2022/info/awards/test-of-time-awards (last visited Oct. 3, 2023).
Ex-1032	Takeo Igarashi & Ken Hinckley, Speed-dependent Automatic Zooming for Browsing Large Documents 139-148 (2000).

Ex. No.	Description
Ex-1033	U.S. Patent Application Publication No. 2008/0316183 ("Westerman")

II. LEGAL STANDARDS

22. In forming my opinions and considering the subject matter of the '922 Patent and its claim in light of the prior art, I am relying on certain legal principles that counsel in this case explained to me. My understanding of these concepts is summarized below.

23. I understand that earlier publications and patents may act to render a patent unpatentable for one of two reasons: (1) anticipation, and (2) obviousness.

A. Anticipation

24. It is my understanding that the claims of a patent are anticipated by a prior art reference if each and every element of the claim is found either explicitly or inherently in the reference. I understand that inherency requires a showing that the missing descriptive matter in the claim is necessarily present in the allegedly anticipating reference, and that it would have been so recognized by a person of ordinary skill in the art ("POSITA").

25. I understand that when a challenged claim covers several structures, either generically or as alternatives, the claim is deemed anticipated if any of the structures within the scope of the claim is found in the prior art reference.

26. Although anticipation typically involves the analysis of a single prior art reference, I understand that additional references may be used to show that the prior art reference has enabling disclosure (i.e., allows a POSITA to make the invention without undue experimentation), to explain the meaning of a term used in the prior art reference, and/or to show that a characteristic is inherent in the prior art reference.

B. Obviousness

27. I understand that a claim is invalid as obvious if it would have been obvious to a person of ordinary skill in the art at the time the alleged invention was made. This means that even if all of the elements of the claim cannot be found in a single prior art reference that would anticipate the claim, a person of ordinary skill in the art who was aware of the prior art would have been able to come up with the claimed invention. This may be the case, for example, where the missing element represents only an insubstantial different over the prior art or a reconfiguration of a known system. I understand that in an obviousness determination, the person of ordinary skill in the art is presumed to have knowledge of all material prior art.

28. I understand that an obviousness analysis requires an understanding of the scope and content of the prior art, any differences between the alleged invention and the prior art, and the level of ordinary skill in evaluating the pertinent art.

29. I understand that when a product is available, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill in the art can implement a predictable variation, obviousness likely bars its patentability. For the same reason, if a technique has been used to improve one device and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique would have been obvious.

30. I understand that whether a prior art reference renders a patent claim unpatentable as obvious is determined from the perspective of a person of ordinary skill in the art at the time of the alleged invention. I have been told that there is not requirement that the prior art contain an express suggestion to combine known elements to achieve the claimed invention, but a suggestion to combine known elements to achieve the claimed invention may come from the prior art, as filtered through the knowledge of one skilled in the art. In addition, I have been told that the inferences and creative steps a person of ordinary skill in the art would employ are relevant to the determination of obviousness.

31. I understand that one may consider, e.g., whether (1) the change was merely the predictable result of using prior art elements according to their known functions, or whether it was the result of true inventiveness; (2) there is some teaching or suggestion in the prior art to make the modification or combination of

elements claimed in the patent; (3) the claimed innovation applies a known technique that had been used to improve a similar device or method in a similar way; (4) the claimed invention would have been obvious to try, meaning that the claimed innovation was one of a relatively small number of possible approaches to the problem with a reasonable expectation of success by those skilled in the art; (5) the invention merely substituted one known element for another known element in order to obtain predictable results; (6) the invention merely applies a known technique to a known device, method, or product to yield predictable results; or (7) known work in one field of endeavor may have prompted variations of it for use in either the same field or a different one based on design incentives or other market forces that would have been predictable to a person of ordinary skill in the art.

32. I further understand that certain factors may support or rebut the obviousness of a claim. I understand that such secondary considerations include, among other things, commercial success of the patented invention, skepticism of those having ordinary skill in the art at the time of the invention, unexpected results of the invention, any long-felt but unsolved need in the art that was satisfied by the alleged invention, the failure of others to make the alleged invention, praise of the alleged invention by those having ordinary skill in the art, and copying of the alleged invention by others in the field. I understand that there must be a nexus—that is, a connection—between any such secondary considerations and the alleged invention.

I also understand that contemporaneous and independent invention by others is a secondary consideration tending to show obviousness.

33. I am not aware of any allegations by the named inventor of the '922 Patent or any assignee of the '922 Patent that any secondary considerations tend to rebut the obviousness of the '922 Patent.

34. Additionally, I understand that in considering obviousness, it is important not to use the benefit of hindsight derived from the patent under consideration.

C. Level of Ordinary Skill in the Art

35. When interpreting a patent, I understand that it is important to identify the relevant art pertaining to that patent, as well as the level of ordinary skill in that art at the time of the claimed invention. The “art” is the field of technology to which the patent is related.

36. I am informed and understand that the POSITA is a hypothetical person who is presumed to know the relevant prior art. I understand that the actual inventor's skill is not determinative of the level of ordinary skill. I further understand that factors that may be considered in determining level of skill include: (i) the types of problems encountered in the art; (ii) prior art solutions to those problems; (iii) the rapidity with which innovations are made; (iv) the sophistication of the technology; and (v) the educational level of active workers in the field. I

understand that not all such factors may be present in every case, and one or more of them may predominate.

37. I understand that a POSITA is one who is presumed to be aware of all pertinent art, thinks along conventional wisdom in the art, and is a person of ordinary creativity. A POSITA would have had knowledge of circuit boards and microcircuits, including components thereof, and related technologies as of July 3, 2009.

38. A person of ordinary skill in the art at the relevant time (“POSITA”) would have had a bachelor’s degree in electrical engineering, computer science, computer engineering, or a related field, and two-three years of experience in the research, design, development, or testing of graphical user interfaces, touchscreens, and mobile devices, with additional education substituting for experience and vice versa.

39. Based on my education and experience, I would have, at least, met the criteria for a POSITA in July 3, 2009, and I still exceed it today.

D. Claim Construction

40. I understand that the United States Patent and Trademark Office interprets claim terms in an *inter partes* review proceeding under the same claim construction standard that is used in a United States federal court. I understand that

under this standard, the meaning of claim terms is considered from the viewpoint of a POSITA at the time of the alleged invention.

41. I have been informed that claim terms are generally given their ordinary and customary meaning as understood by one of ordinary skill in the art in light of the specification and the prosecution history pertaining to the patent. I understand, however, that claims terms are generally not limited by the embodiments described in the specification.

42. I understand that in addition to the claims, specification, and prosecution history, other evidence may be considered to ascertain the meaning of claim terms, including textbooks, encyclopedias, articles, and dictionaries. I have been informed that this other evidence is often less significant and less reliable than the claims, specification, and prosecution history.

III. SUMMARY OF GROUNDS

43. I understand that Petitioner challenges the validity of Claims 1-24 of the '922 Patent. It is my opinion that the following grounds demonstrate that the claims of the '922 Patent are invalid:

Ground	Summary
1	Claims 1-4, 6-19, and 21-24 are obvious in view of Louch (Ex-1005)

Ground	Summary
2	Claims 5 and 20 are obvious over Louch in view of Hepp (Ex-1007)
3	Claims 8, 13-17, 21, 22, and 24 are obvious over Louch in view of Duarte (Ex-1010).
4	Claim 23 is obvious over Louch in view of Park (Ex-1011).
5	Claims 1-13 and 17-24 are obvious over the combination of Duarte, Biggs (Ex 1012), and Hotelling (Ex 1006).
6	Claims 14-16 are obvious over the combination of Duarte, Biggs, and Hotelling in further view of Louch.

IV. THE '922 Patent

A. Overview of the '922 Patent

44. The '922 Patent is directed to the display on the touchscreen of a wristwatch. The patent recognizes that watches with touchscreens were well-known in the art. Ex-1001, 1:25-57, 2:15-17.

45. The '922 Patent uses the term “card” to describe a widget or item on the touchscreen. *Id.*, 4:16-32. The patent describes organizing the cards in rows or

columns and using the touchscreen to scroll in a horizontal or vertical direction through the cards, as illustrated in Figure 2 below. *Id.*, 7:14-20.

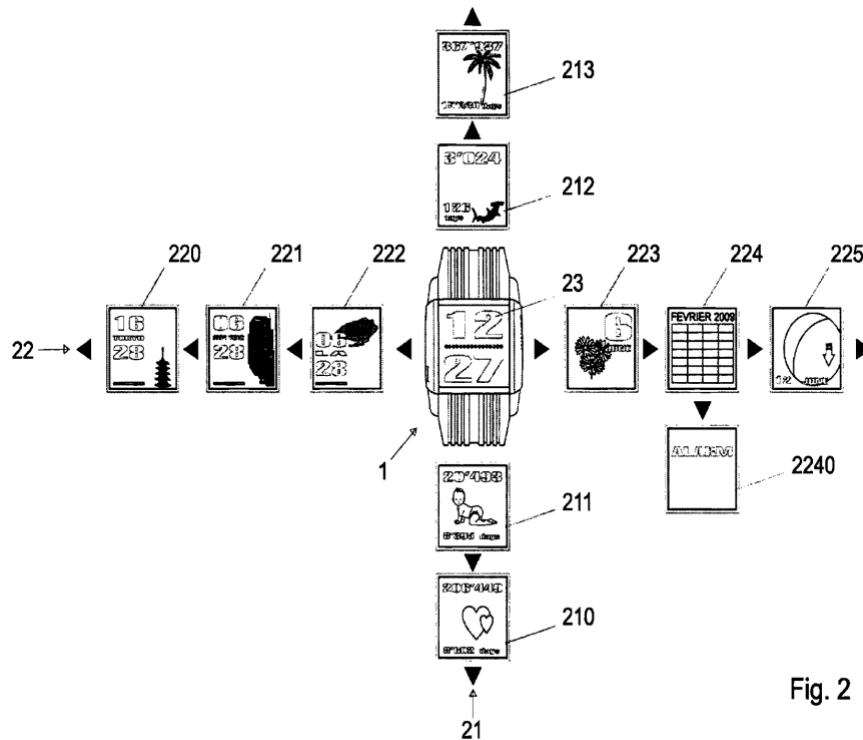


Fig. 2

B. Prosecution History of the '922 Patent

46. I understand the '922 Patent was filed December 22, 2011, as a continuation of international patent application PCT/EP2010/059323 filed June 30, 2010. I also understand it claims priority to Swiss patent application CH2009/1036, filed July 3, 2009.

47. During prosecution, the claims were rejected over a patent to Blasko (US 2006/0092177). Ex-1004, 0284. The applicant amended the claims to recite “touch-sensitive glass” instead of “tactile glass” (*Id.*, 0315) and distinguished

Blasko by arguing that it did not disclose a touch screen capable of detecting a direction of movement of a finger on the screen. *Id.*, 0320. The applicant further argued Blasko did not disclose scrolling cards to lastingly replace an initial card with another displayed card and could not be combined with a more capable touch-screen interface designed for a larger device because Blasko's interface was designed to use only discrete tactile areas. *Id.*, 0320, 0433.

48. After further rejections, the applicant distinguished additional prior art by amending the claims to add a limitation to the independent claims that when scrolling, a card is "immediately and without further under intervention" replaced by a different card that occupies the entire display. *Id.*, 0637-0642.

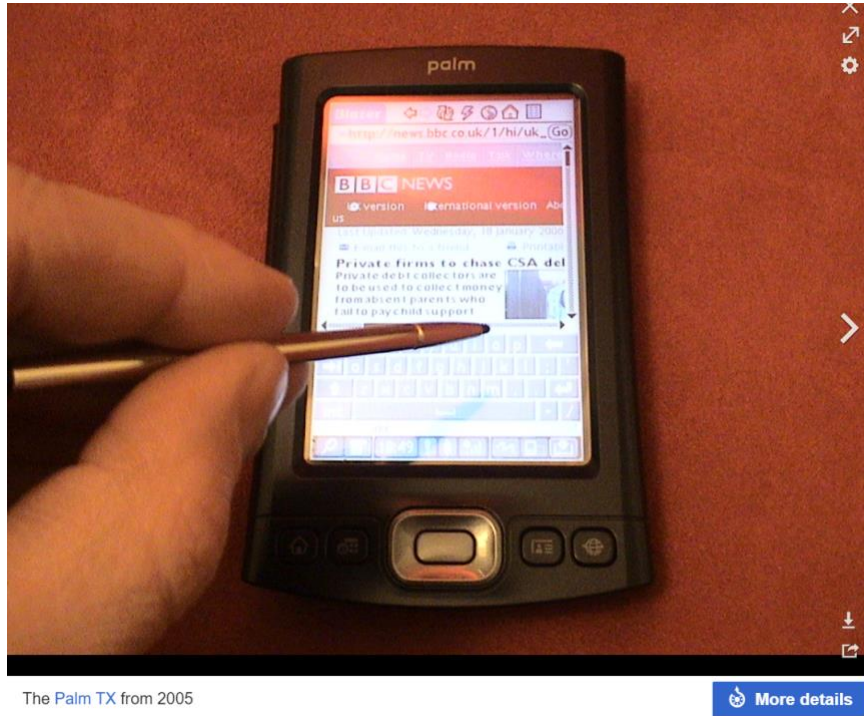
49. The prior art I apply to the claims in my declaration was not before the USPTO during prosecution of the '922 Patent. And as I discuss below, this art discloses the '922 Patent's claims, including the features the applicant contended were new. Thus, my declaration presents substantially new arguments that were not considered during prosecution.

V. TECHNOLOGY BACKGROUND

50. To provide background for the element-by-element analysis of the claims to follow, below I present an overview of the state of the art existing at the time of the alleged invention relating to graphical user interfaces generally, and mobile devices and navigating through widgets on a touchscreen more specifically,

among other relevant technology. As I will describe below from a high-level functional perspective, in the next section based on specific prior art, and then in subsequent sections on a limitation-by-limitation basis, all of these technologies and techniques were well-known to those of ordinary skill in the art at the time of the alleged invention claimed in the '922 Patent, and a POSITA would have readily understood the combination of elements of Claim 1-24 to have been obvious.

51. Using a touchscreen as an interface element on a mobile electronic device was well known by the time the '922 Patent was filed. As one example, the Palm PDA was a small portable device in wide use in the early 2000s time frame that allowed a user to interact with various applications using a graphical user interface displayed on a touch-sensitive high-resolution LCD screen. Ex-1018. Included below, for example, is the Palm TX from 2005. *Id.*



52. On devices such as the one shown above, a user could make gestures such as taps, double taps, drags, and similar motions using a stylus or a finger to interact with applications such as calendars, agendas, and on some models, web browsers, email clients, and telephone dialers. *Id.*

53. Such touchscreen interfaces were not limited to handheld devices. For example, by 2001, IBM had introduced a prototype wristwatch with a touch-sensitive digital matrix LCD screen running the Linux operating system, as shown below. Ex-1008; Ex-1021.



54. The IBM Linux watch was a highly capable device and included a “touch sensitive LCD display 96x120 pixels” and a powerful processor capable of running the Linux operation system version 2.2 and supporting X11 R6 graphics. Ex-1008, 2-3. IBM reported that the “watch will provide users with calendar, address book, and to-do list functions.” *Id.*, 2. As IBM stated in a 2002 IEEE article about the Linux watch, “Our work has convinced us that a lot of functionality can be squeezed into small devices.” Ex-1021, 9. Thus, by the early 2000s, a POSITA would have understood that adapting capable touch-screen interfaces for use in the form factor of a watch was not only possible but had also been successfully achieved.

55. This knowledge is also reflected in patents from that time period. For example, U.S. Patent No. 8,344,998 (“Fitzgerald”), with an early 2008 priority date,

describes a small electronic watch with a “body 16 that houses a plurality of layers, including an integrated display 18 (which may be a touchscreen) and a movement subassembly 20, for displaying information, including time.” Ex-1014, 3:21-25.

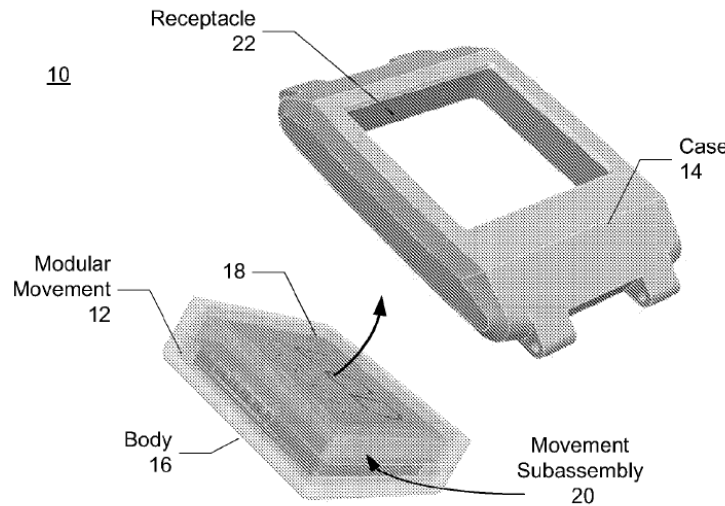


FIG. 1A

56. It was also well known in the art in the early 2000s to use a scrolling user interface to switch between active applications or to select an application to execute on a mobile device. For example, U.S. Patent Publication No. 2008/0168368 to Louch discloses a watch with a touchscreen that can display a plurality of “widgets,” which are graphical user interface elements that allow a user to interact with an application. Ex-1005 ¶7; Fig. 1F (below).

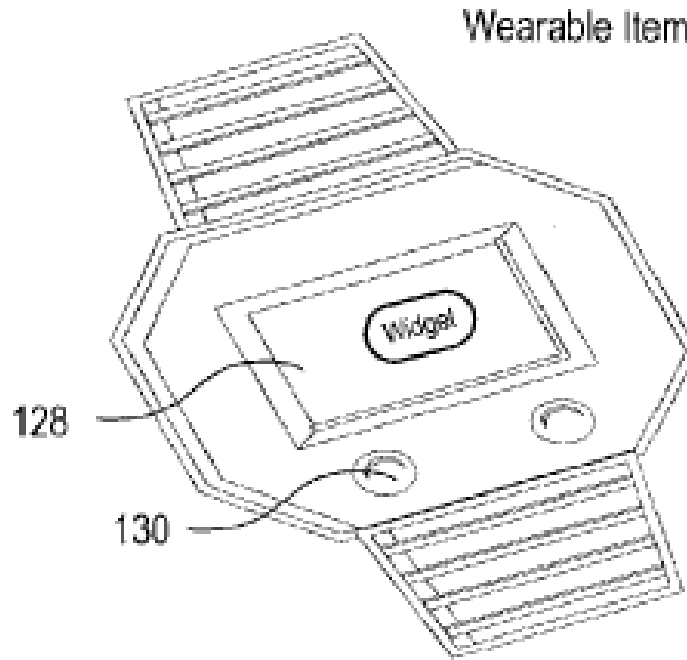


FIG. 1F

57. To select a desired application, “widgets are scrolled across the display area” “using a finger or stylus.” *Id.* ¶79. In some embodiments, “the user can make a single touch and gesture and widgets will be continuously scrolled by the display 514 in a Rolodex® manner and slowly de-accelerate to a stop.” *Id.* ¶87.

58. As another example, U.S. Patent Publication No. 2009/0199130 to Tsern discloses a wristwatch with a touch-sensitive screen. Ex-1022 ¶14. The watch screen can display a scrollable set of icons representing available applications. *Id.* ¶18. Shown Figure 3 below is “a swipe operation from anywhere on the right side of the display 102 to the left side of the display 102” that causes “application icons

[to] move from one end of the display (from the right side in the embodiment illustrated) to another end.” *Id.* ¶18, Fig. 3.

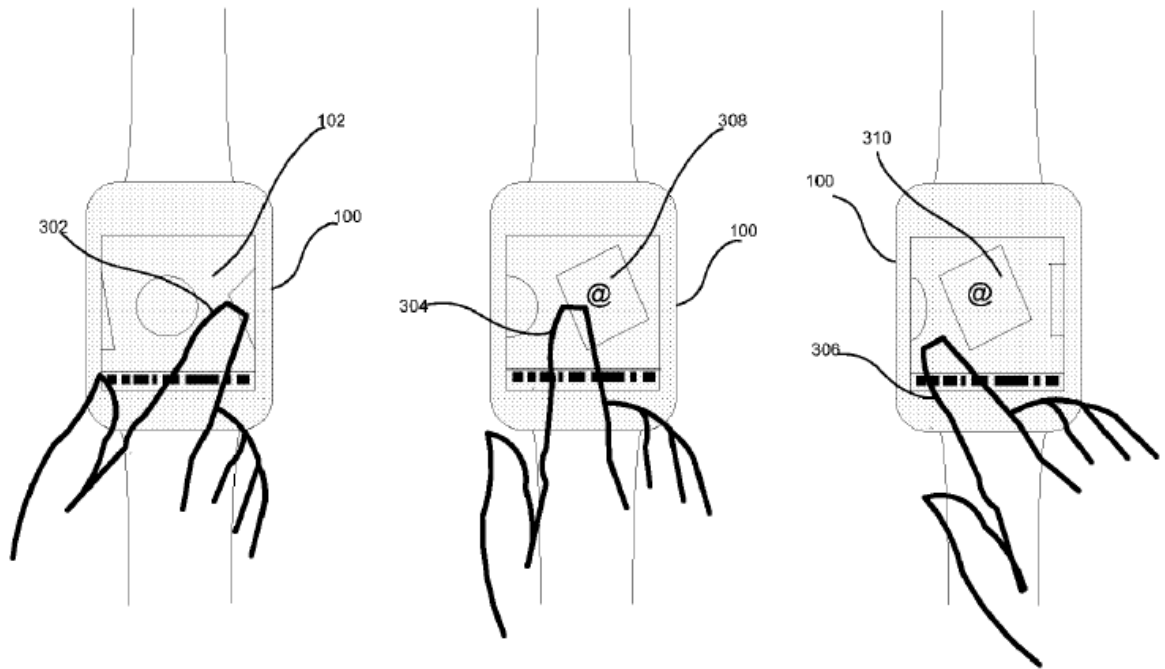


FIG. 3

59. Thus, by the time the '922 Patent was filed, a POSITA would have been familiar with the concept of using finger gestures on the touchscreen of a watch to scroll through multiple graphical user interfaces for various applications that perform different functions. The specific art I discuss below demonstrates that all of the '922 Patent's claims were obvious.

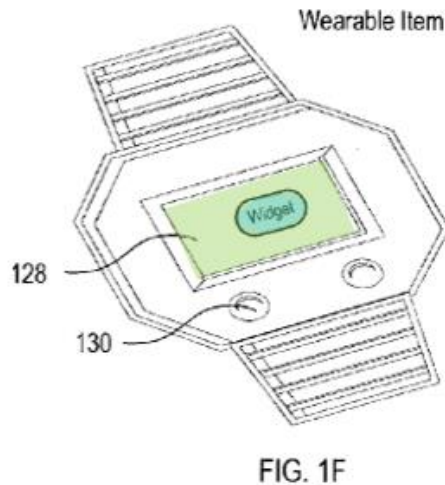
VI. THE PRIOR ART IN THE APPLIED INVALIDITY GROUNDS

A. Louch (U.S. Patent Publication No. 2008/0168368) (Ex-1005)

60. Louch, titled “Dashboards, widgets, and devices,” was published on July 10, 2008. Ex-1005, Cover.

61. I understand Louch is prior art under at least 35 U.S.C. § 102(b).

62. Louch discloses “a digital watch” with a touch sensitive display area 128 that can display a dashboard/widget, as shown in Figure 1F. *Id.* ¶49.



Ex-1005, Fig. 1F (annotated).

63. Louch explains that that a widget “can consume the entire display area 406 or a portion thereof.” *Id.* ¶67.

64. Louch also teaches a user can move a finger horizontally or vertically across the touchscreen to scroll through available widgets to find a desired widget, as shown in Figure 5B. *Id.* ¶¶79, 80.

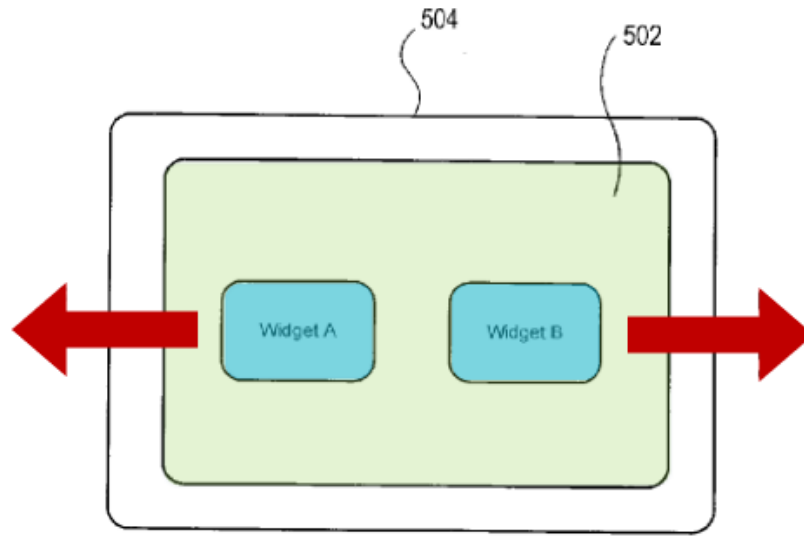


FIG. 5B

Ex-1005, Fig. 5B (annotated).

B. Hepp (U.S. Patent No. 6,449,219) (Ex-1007)

65. Hepp, titled “Time sensing device,” issued on September, 10, 2002.

Ex-1007, Cover.

66. I understand Hepp is prior art under at least 35 U.S.C. § 102(b).

67. Hepp describes displaying the time on a touchscreen by simulating a mechanical watch with clock hands, as shown in Figure 1. *Id.*, 4:55-58, 6:27-31, 6:66-7:5.

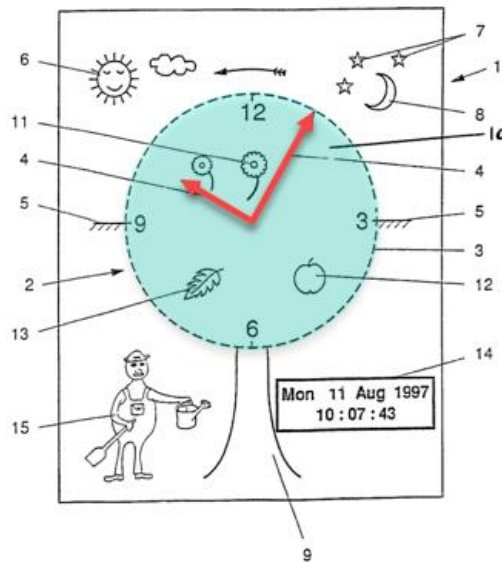


Fig. 1

Ex-1007, Fig 1. (annotated).

C. Duarte (U.S. Patent No. 8,296,684) (Ex-1010)

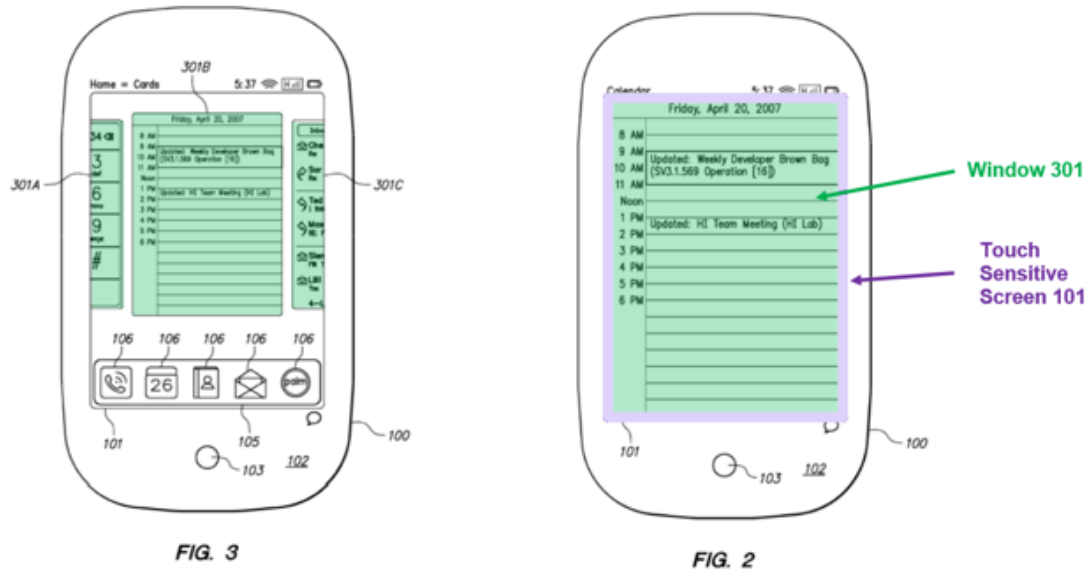
68. Duarte, titled “Navigating among activities in a computing device,” issued on October 23, 2012. Ex-1010, Cover.

69. I understand Duarte is prior art under at least 35 U.S.C. §102(e).

70. Duarte describes touchscreens on small devices that users can swipe horizontally or vertically to move cards (which Duarte identifies as windows 301) organized in rows and/or columns. *Id.*, 6:59-7:17, 7:44-8:4.

71. Duarte also teaches that windows 301 can be scrolled in full-screen mode, in which the windows 302 fill the entire touchscreen display. *Id.*, 6:59-63. Duarte further discloses that, during scrolling, the cards can automatically snap into

position upon completion of the scrolling. *Id.*, 7:6-10. Duarte also describes that windows 301 may be scrolled in a closed loop. *Id.*, 8:17-22.



Ex-1010, Figs 2-3 (annotated).

D. Park (U.S. Patent Publication No. 2008/0062207) (Ex-1011)

72. Park, titled “Scrolling method and mobile communication terminal using the same,” was published on March 13, 2008. Ex-1011, Cover.

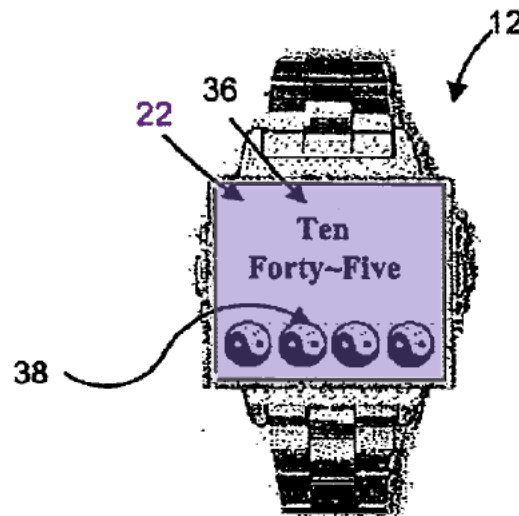
73. I understand Park is prior art under at least 35 U.S.C. § 102(b).

74. Park discloses a portable device with a touchscreen that a user can swipe to scroll through cards (which Park calls “pages”). *Id.* ¶34. Park further describes that the cards can be scrolled one page at a time. *Id.* ¶44, 55.

E. Biggs (U.S. Patent No. 6,714,486) (Ex-1012)

75. Biggs, titled “System and method for customized time display,” was issued on March 30, 2004 and is § 102(b) prior art. Ex-1012, Cover.

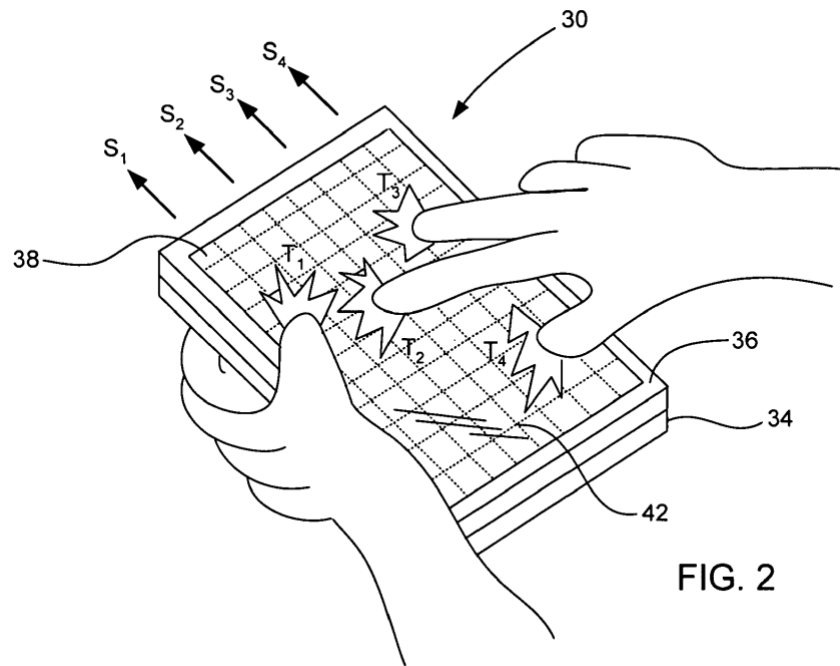
76. Biggs discloses a wristwatch with a touch-sensitive LCD display that allows a user to select various user-customizable displays for indicating the time. *Id.*, 3:52-56, 3:64-66, 8:41-46, 9:7-16.



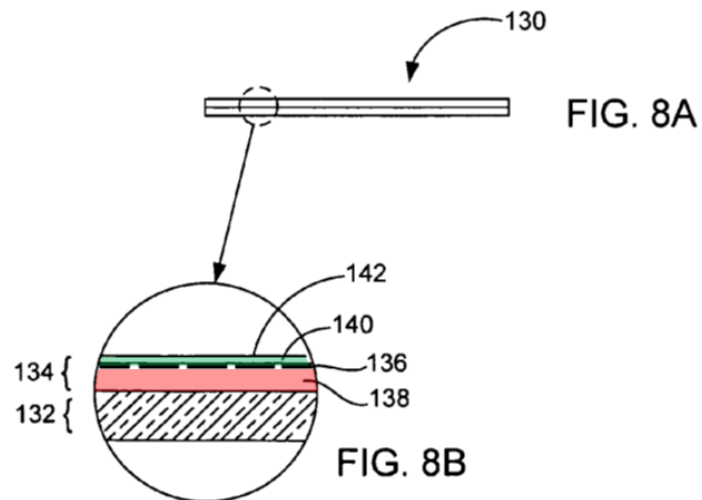
F. Hotelling (U.S. Patent Publication No. 2006/0097991) (Ex-1006)

77. Hotelling, titled “Multipoint touchscreen,” was published May 11, 2006, and is § 102(b) prior art. Ex-1006, Cover.

78. Hotelling describes a multipoint touchscreen 36 allowing a user to interact with a graphical user interface on display 34, as shown below in Figure 2. *Id.* ¶37.



79. Figure 8 illustrates a cross-section of touchscreen 134 and LCD display 132.



80. Glass member 138 (shaded red) and protective cover sheet 140 (shaded green) are part of touchscreen 134 and protect display 132 from forces exerted on touchscreen 134. *Id.* ¶¶71-72. Protective cover sheet 140 may also be glass. *Id.*

VII. CLAIM CONSTRUCTION

81. I do not believe that any claim term requires explicit construction to resolve the issues presented in this Petition. I apply the plain and ordinary meaning to each claim term, as that plain and ordinary meaning would have been understood by a POSITA.

82. I reserve the right to offer opinions on any claim constructions proposed in this proceeding or to offer opinions on additional constructions in the district court.

VIII. DETAILED EXPLANATION OF THE UNPATENTABILITY GROUNDS

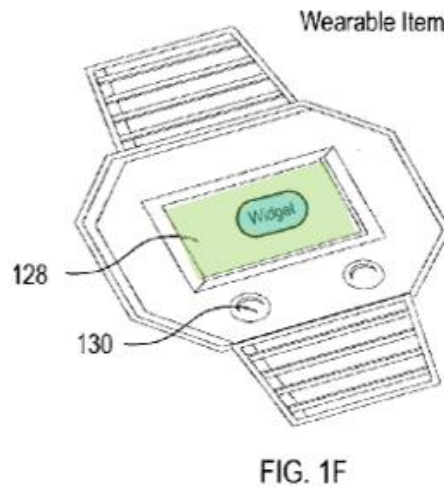
A. Ground 1: Claims 1-4, 6-19, and 21-24 are obvious in view of Louch.

1. Independent claim 1

a. Element 1[pre]: A wristwatch having

83. In my opinion, Louch teaches the preamble of Claim 1, to the extent it is limiting.

84. As shown in Figure 1F, Louch discloses “a digital watch” with a touch sensitive display area 128 that can display a dashboard/widget. Ex-1005 ¶49.



Ex-1005, Fig. 1F (annotated).

85. Thus, it is my opinion that Louch discloses a wristwatch as described in the preamble.

b. Element 1[a]: a digital matrix display;

86. In my opinion, Louch teaches Element 1[a].

87. The '922 Patent defines a matrix display as “a display formed by a matrix of pixels” and contrasts segmented displays, which use several segments of liquid crystals to form a limited number of symbols. Ex-1001, 1:20-30.

88. Matrix displays were well known in the art and are distinguished from segmented displays in that the imaging elements of matrix displays are small pixels (usually square or rectangular) arranged in an array such that an image can be represented by a pattern of dots. For example, Ex-1016 describes active matrix

liquid-crystal displays (LCD) as a technology that was conceptualized in the 1970s and implemented a few years later.

89. Though Louch does not expressly use the terms “matrix” or “pixel,” a POSITA would have understood the displays described in Louch are digital matrix displays. For example, Louch identifies a liquid crystal display (LCD) as examples of a display device used in notebook computers and PDAs, and describes software development tools (“Web Kit, Dashcode®, and Xcode®” from Apple) that can display web content in windows. Ex-1005 ¶¶114, 37, 44, 45. And Louch further describes widgets that users can freely move around a dashboard. *Id.* ¶34. From these disclosures, a POSITA would have recognized that only a digital matrix display would have been capable of satisfying these requirements. A user could not, for example, freely move an object around a segmented display, which provides only large fixed LED, liquid crystal, or other display technology elements designed to form a limited set of characters. *See, e.g.*, Ex-1017, which provides examples of 7-, 9-, 14-, and 16-segment displays. Therefore, a POSITA would have understood that Louch teaches a digital matrix display as contemplated in the ’922 Patent.

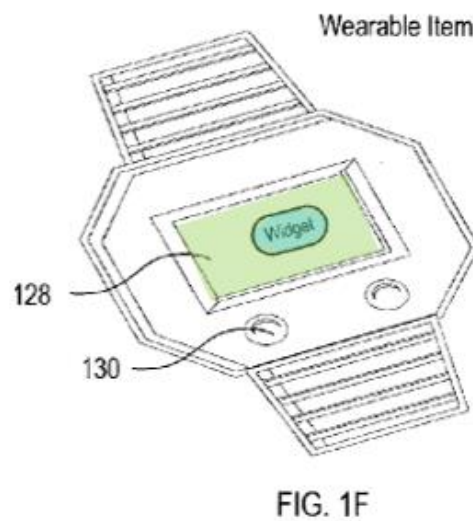
90. As an example of a “multi-touch-sensitive display,” Louch incorporates Hotelling, which expressly describes an LCD as a “matrix” display (Ex 1006 ¶51), by reference in its entirety.

91. Thus, it is my opinion that Louch teaches a digital matrix display.

c. Element 1[b]: a sheet of touch-sensitive glass

92. In my opinion, Louch teaches Element 1[b].

93. Discussing Figure 1F, Louch discloses that “a typical input device for a digital watch would be one or more pushbuttons 130 and/or *a touch sensitive display area 128.*” Ex-1005 ¶49.



Ex-1005, Fig. 1F (annotated).

94. A POSITA would have known that touch-sensitive screens typically use glass covers to protect the underlying electronics from being damaged. In fact, the '922 Patent acknowledges that “wristwatches with a sheet of touch-sensitive glass allowing it to react to the user’s finger on clearly identified portions of the glass are also known.” Ex-1001, 1:31-33. Using glass in Louch’s touch-sensitive display would have been an obvious design choice. For example, US 8,344,998 to

Fitzgerald discloses a watch having a “color LCD display” with “a glass overlay and a touch overlay.” Ex-1014, 3:63-66.

95. Moreover, Hotelling, which Louch incorporates in its entirety as an example of a multi-touch-sensitive display (Ex-1005 ¶43), discloses that touch sensitive display area 128 includes glass: “The touch screen 134 includes a transparent electrode layer 136 that is positioned over a glass member 138. The glass member 138 may be a portion of the LCD display 132 or it may be a portion of the touch screen 134.” Ex-1006 ¶71; *see also id.* ¶72 (“The protective cover sheet 140 may be formed from any suitable clear material such as glass and plastic.”).

96. Thus, it is my opinion that Louch teaches a touch sensitive glass.

d. Element 1[c]: a processing circuit specifically laid out so as to interpret the signals from the touch-sensitive glass, for selecting a card from several available cards depending on these signals and for displaying said card on the entire digital matrix display

97. In my opinion, Louch teaches Element 1[c].

98. The recited processing circuit corresponds to the processor in Louch. For example, Louch discloses that “in some implementations, a device includes a touch-sensitive display; and a processor operatively coupled to the display.” Ex-1005 ¶12; *see also id.* ¶¶112-13.

99. Louch “interpret[s] the signals from the touch-sensitive [display] glass, for selecting a card from several available cards depending on these signals and for

displaying said card.” The recited cards correspond to the widgets in Louch. The ’922 Patent defines “card” as “a control, or **widget**, displayed on the watch’s graphical interface.” Ex-1001, 4:17-19. Louch explains that “the processor is operable for presenting widgets on the display in response to touch input, and to scroll the widgets on the display in response to touch input.” Ex-1005 ¶12.

100. Louch also teaches that a user is able to “select[] a card from several available cards.” Discussing Figure 5B, Louch states: “In some implementations, the user can scroll (horizontally or vertically) through dashboards or widgets across the display area 502 by touching the widgets and making the appropriate finger gestures in horizontal or vertical directions. When a desired dashboard/widget is found, the user can click or touch the dashboard/widget to invoke the widget.” Ex-1005 ¶80.

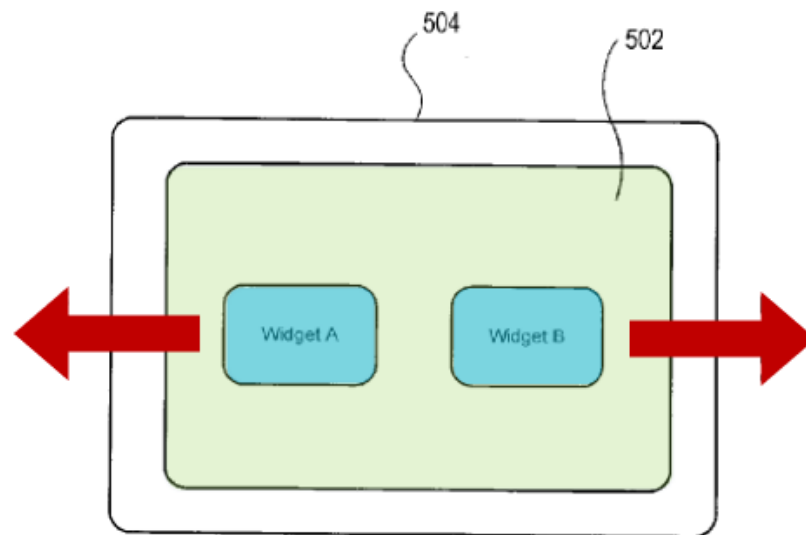


FIG. 5B

Ex-1005, Fig. 5B (annotated).

101. Louch also teaches that the selected card/widget can be displayed on the “entire digital matrix display.” For example, Louch teaches that a widget “can consume the entire display area 406 or a portion thereof.” Ex-1005 ¶67; *see also id.* ¶80 (designing a widget that “is displayed to cover the entire display area 502 (full screen).”), ¶81 (describing a widget that is “expanded to consume substantially all of the multi-touch sensitive display area”), Claims 26, 27.

102. Thus, it is my opinion that Louch teaches a processing circuit that interprets the signals from the touch-sensitive glass and allows a user to select a card from several available cards depending on these signals where the selected card can be displayed on the entire digital matrix display.

e. Element 1[d]: wherein said touch-sensitive glass is a two-dimensional glass for detecting a movement of at least one finger at any place on the touch-sensitive glass along at least two different directions

103. In my opinion, Louch teaches Element 1[d].

104. Louch teaches a touch-sensitive display as described above with reference to Element 1[b]. In the context of the claims, “two-dimensional glass” refers to the touch surface of the glass that the user interacts with it. Ex-1001, 2:7-23. Louch and Hotelling teach a display having a two dimensional touch surface for interacting with widgets as described with reference to Element 1[b]. A POSITA would have understood Louch’s display to be a two-dimensional glass because

Louch discloses that a user can make finger gestures on the screen to scroll in either a vertical or horizontal direction. Ex-1005 ¶87.

105. Louch discloses its touch-sensitive display is able to detect the movement of at least one finger at any place along at least two different directions. For example, Louch teaches that its “processor is configurable for generating a dashboard environment including a number of widgets, and for allowing the widgets to be scrolled *in multiple directions* in the display *by a user touching the display and gesturing with one or more fingers.*” Ex-1005 ¶18. Discussing Figure 5B, Louch states that “the user can scroll (*horizontally or vertically*) through dashboards or widgets across the display area 502 by touching the widgets and making the appropriate *finger gestures in horizontal or vertical directions.*” *Id.* ¶80.

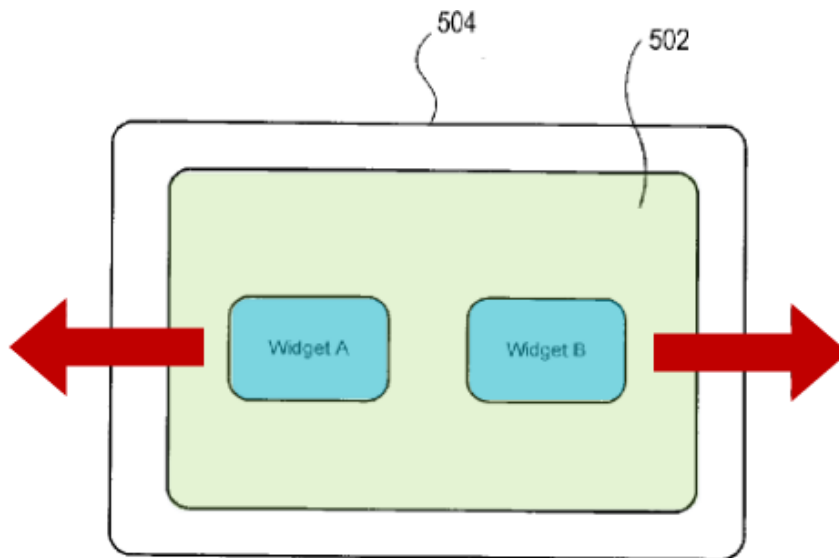
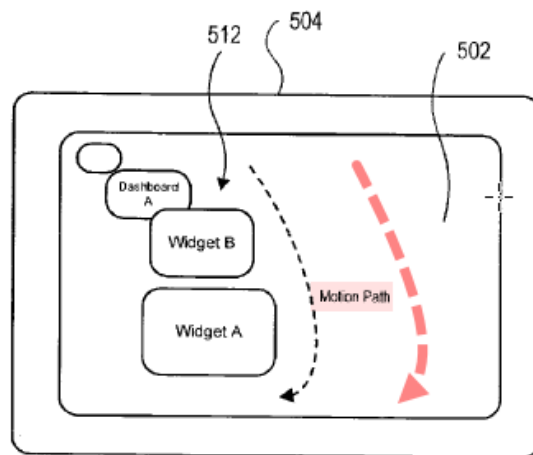
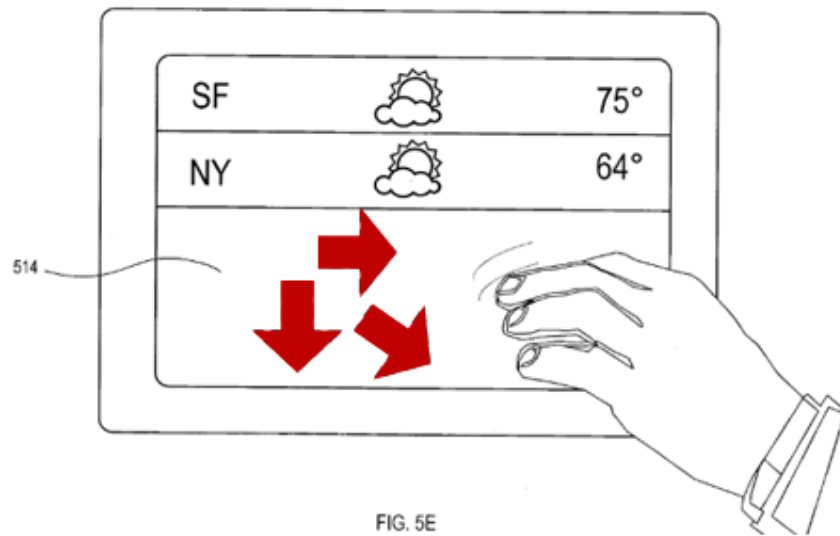


FIG. 5B

Ex-1005, Fig. 5B (annotated).

106. Louch also states that a user can “make a gesture in any direction in the plane of the display 514 to scroll through open or closed widgets” and that “[s]crolling can be horizontal, vertical and diagonal.” *Id.* ¶87.



As can be observed at Figures 5D-5E, the touch-sensitive glass can detect movement of at least one finger at any place on the touch-sensitive glass along at least two

dimensions. Ex-1005, Figs. 5D-5E (annotated). Depending on the two-dimensional movement or gesture: motion, touch, or click, and where on the display it occurs, there will be a corresponding action, such selecting a widget or scrolling through widgets. Ex-1005 ¶¶85-87 (“For example, the user can touch the display 514 of a device (e.g., a mobile phone) with one or more fingers and make a gesture in any direction in the plane of the display 514 to scroll through open or closed widgets or dashboards, or to access features of same.”).

107. Thus, it is my opinion that Louch teaches a touch-sensitive two-dimensional glass for detecting a movement of at least one finger at any place on the touch-sensitive glass along at least two different directions.

- f. Element 1[e]: wherein said processing circuit is specifically laid out so as to cause said several available cards to scroll past in order to lastingly replace the initially displayed card with a replacement card selected between said several available cards, wherein each card of said several available cards has a distinct fixed or periodically refreshed image**

108. In my opinion, Louch teaches Element 1[e].

109. As described above for Element 1[c] (Section VIII.A.1.d), Louch discloses that a user can use the display to scroll through widgets. A POSITA would have understood that this scrolling would cause “several available cards to scroll past in order to lastingly replace the initially displayed card with a replacement card,” as recited in Element 1[e]. Louch itself discloses scrolling through multiple

widgets using left or right finger gestures to select a particular widget to be displayed in place of an original one, and a POSITA would have been familiar with such scrolling operations from devices available at the time, such as the Palm Pilot PDA. *See, e.g.*, Ex-1018. For example, Louch states, “In some implementations, the user can scroll (horizontally or vertically) through dashboards or widgets across the display area 502 by touching the widgets and making the appropriate finger gestures in horizontal or vertical directions.” Ex-1005 ¶80. During scrolling, the desired widget stays on the display and thus lastingly replaces the initially displayed widget. Moreover, Louch also states that “widgets will be continuously scrolled by the display 514 in a Rolodex® manner and slowly decelerate to a stop.” *Id.* ¶87. Once the scrolling stops, the last widget would be displayed on the screen, lastingly replacing the original one, just like a scrolling Rolodex would lastingly settle at specific card.

110. The widgets in Louch have “a distinct fixed or periodically refreshed image” as recited in Element 1[e]. For example, Louch discloses that a widget may be a “clock.” *Id.* ¶35. A clock is a “periodically refreshed image.” Ex-1001, 4:21-25 (card may be “periodically refreshed, for example for displaying the current time.”). A POSITA would have understood that other widgets could be periodically refreshed to provide updated information, such as widgets showing news, weather, or stock prices, for example. Louch also discloses that a widgets may be “icon or

thumbnail images.” Ex-1005 ¶35. These are example of a “distinct fixed . . . image.” For example, a POSITA would have been familiar with icons from devices such as PDAs or laptops running MacOS or Windows and would have understood an icon to be a fixed image. Thus, a widget in Louch “has a distinct fixed or periodically refreshed image.”

111. It is my opinion that Louch teaches a processing circuit that allows a user to scroll through several available cards in order to lastingly replace the initially displayed card with a replacement card selected between said several available cards. And that each card of said several available cards has a distinct fixed or periodically refreshed image.

g. Element 1[f]: wherein the size of the image corresponds to the size of said digital matrix display so that the displayed card occupies the whole of said digital matrix display

112. In my opinion, Louch teaches Element 1[f].

113. Louch teaches that a widget “can consume the entire display area 406 or a portion thereof.” Ex-1005 ¶67; *see also id.* ¶80 (designing a widget that “is displayed to cover the entire display area 502 (full screen).”), ¶81 (describing a widget that is “expanded to consume substantially all of the multi-touch sensitive display area”). *See also id.* Cls. 26, 27.

114. Thus, it is my opinion that Louch teaches that the displayed card can occupy the whole of said digital matrix display.

h. Element 1[g]: wherein one card of said several available cards and occupying the entire digital matrix display is immediately and without further user intervention replaced after the scrolling by a different card of said several available cards that occupies the entire digital matrix display

115. In my opinion, Louch teaches Element 1[g].

116. Louch teaches that a new card can replace a previous card “without user intervention.” Louch generally teaches that a widget may “consume the entire display area.” Ex-1005 ¶67. And even if this teaching were somehow interpreted as limited to Figure 4A, it would have been obvious to POSITA to apply the same teaching to Figure 5B and to a wearable device such as a watch, for the reasons expressed in the technology background, ¶¶51-59. In fact, a POSITA would have been motivated to consume the entire display on a watch because of its more limited display area to avoid unnecessary eye strain. Louch also more generally describes “a process whereby dashboards and/or widgets are scrolled across the display area 502 of the device 504 using a finger or stylus.” *Id.* ¶¶79-80. In addition, Louch discloses that “the user can make a single touch and gesture and widgets will be continuously scrolled by the display 514 in a Rolodex® manner and slowly decelerate to a stop.” *Id.* ¶87. In other words, a user can touch the screen and slide

or flick the finger, and one or more widgets occupying the entire screen will scroll by as the scrolling motion decelerates to a stop, and when the motion stops, the currently displayed widget will have replaced the previous one with no further user intervention. Thus, Louch discloses scrolling through widgets that occupy the entire display and that the scrolling can slow to a stop without further user intervention. During such scrolling, one card/widget would “immediately and without further user intervention” replace another card/widget. Specifically, Louch discloses that a user can “scroll through *open* or closed widgets” (*id.* ¶87) and that a widget that is “opened” is one that has been “expanded to consume substantially all of the multi-touch-sensitive display area.” *Id.* ¶81. Thus, a POSITA would have understood that the scrolling operation could be performed with widgets that occupy the entire display and would do so without further user intervention.

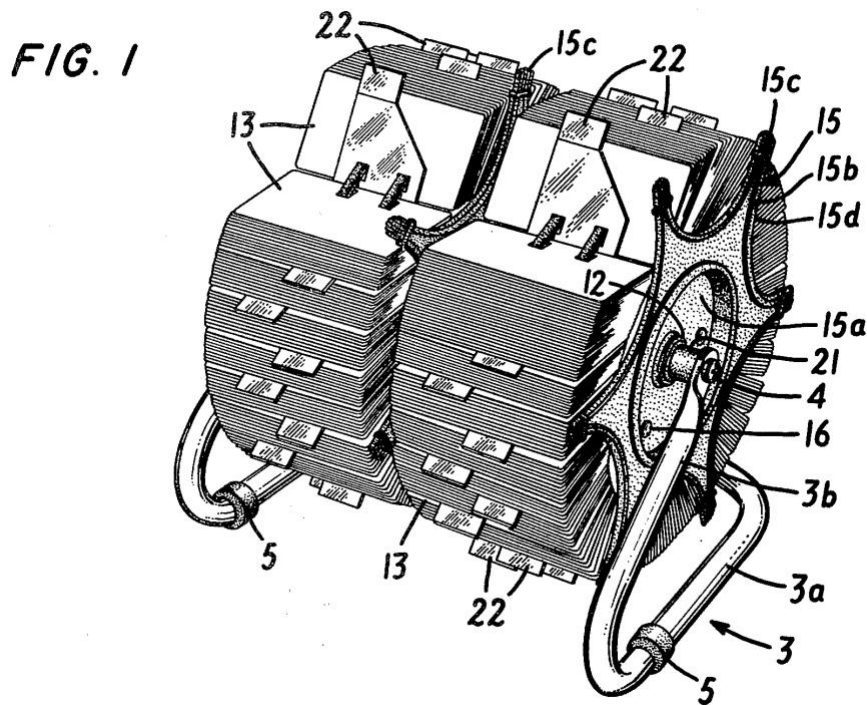
117. Consistent with this broad disclosure, Louch’s dependent claim 26 is directed to an embodiment in which “the widget are scrolled so that one widget is displayed at a time” and dependent Claim 27 is directed to one “wherein the one displayed widget consumes substantially the entire display.”

118. Thus, it is my opinion that Louch teaches that a card occupying the entire digital matrix display is immediately and without further user intervention replaced after the scrolling by a different card that occupies the entire digital matrix display.

- i. **Element 1[h]: wherein said processing circuit is further laid out so that the replacement card is dependent from the initially displayed card and from the direction of said movement and is independent from the starting point and end point of said movement on said digital matrix display**

119. In my opinion, Louch teaches Element 1[h].

120. Louch describes scrolling among widgets, which means that “the replacement card is dependent from the initially displayed card and from the direction of said movement.” Scrolling operates on a group of widgets organized as a list and moves from the displayed widget to another widget either before or after the displayed widget in the list. The ordering of Louch’s widgets is maintained, as Louch discloses, for example, that “widgets will be continuously scrolled by the display 514 in a Rolodex® manner.” Ex-1005 ¶80. A POSITA would have been familiar with the Rolodex® rotary card filing system in which each replacement card is dependent from the initially displayed card. *E.g.*, Ex-1004, Fig. 1 (below).



121. For example, in a Rolodex® directory, if a card for a last name beginning with “C” were initially displayed, a short scroll in one direction would display “D” cards, and a short scroll in the other direction would display “B” cards, so the replacement card depends on the initially displayed card.

122. In Louch, the scrolling direction is based on the direction of the finger movement. Ex-1005 ¶80 (“the user can scroll (horizontally or vertically) through dashboards or widgets across the display area 502 by touching the widgets and making the appropriate finger gestures in horizontal or vertical directions.”). And in Louch, the replacement card/widget “is independent from the starting point and end point of said movement on said digital matrix display.” Louch describes scrolling solely in terms of the direction of the movement: “the user can touch the

display 514 of a device (e.g., a mobile phone) with one or more fingers and make a gesture in any direction in the plane of the display 514 to scroll through open or closed widgets or dashboards, or to access features of same.” *Id.* ¶87. Louch does not require that the movement must begin or end at any particular location, as depicted in Figure 5D. *Id.* ¶56 (“The animated parade can be started by clicking or touching empty space in the display area 502 near the parade.”). In contrast, in embodiments where the user manually selects a widget, selecting that widget requires tapping at the “location of the item.” *See id.* ¶87. Thus, from these contrasting disclosures, a POSITA would have understood that Louch’s scrolling process depends on direction of the movement—not on the particular location of the starting or ending points of the movement.

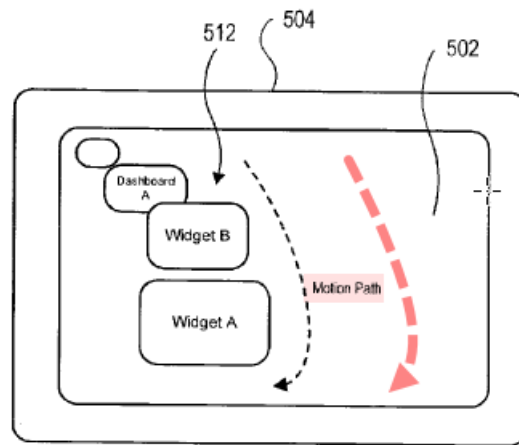


FIG. 5D

123. Moreover, in Louch, scrolling to the replacement card “is controlled by the speed of the finger gestures made by the user.” Ex-1005 ¶87. “[T]he user can

make a single touch and gesture and widgets will be continuously scrolled by the display 514 in a Rolodex® manner and slowly de-accelerate to a stop.” *Id.* Thus, for example, a user could touch the screen at one spot and in one case make a fast flick to the right to scroll 5 cards to the right and in another case, starting from the same point, make a slower flick to the right to scroll two cards to the right. Or the user could touch the screen at a different place and make the same fast flick to the right to scroll 5 cards to the right. Thus, Louch’s finger-speed-based interface is “independent from the starting point and end point of said movement on said digital matrix display.”

124. It is my opinion that Louch teaches that the replacement card is dependent from the initially displayed card and from the direction of said movement and is independent from the starting point and end point of said movement on said digital matrix display.

2. Dependent claims 2-4, 6-8

a. Claim 2: The wristwatch of claim 1, wherein each card shows a particular function of the wristwatch.

125. In my opinion, Louch teaches Claim 2.

126. Louch describes dashboards that display available information, utilities, and functions as various widgets/cards. Ex-1005 ¶34. Louch states that the wristwatch “can provide various functions through widgets.” *Id.* ¶50. For example, Louch states that “[w]idgets can perform tasks for the user, such as providing a clock

or a calculator.” *Id.* ¶35. And Louch further teaches that “a widget can present useful information to the user or help the user obtain information with a minimum of required input.” *Id.* More generally, Louch explains at paragraph 8:

Generally, widgets are user interface elements that include information and one or more tools that let the user perform common tasks and provide fast access to information. Widgets can perform a variety of tasks, including without limitation, communicating with a remote server to provide information to the user (e.g., weather report), providing commonly needed functionality (e.g., a calculator), or acting as an information repository (e.g., a notebook).

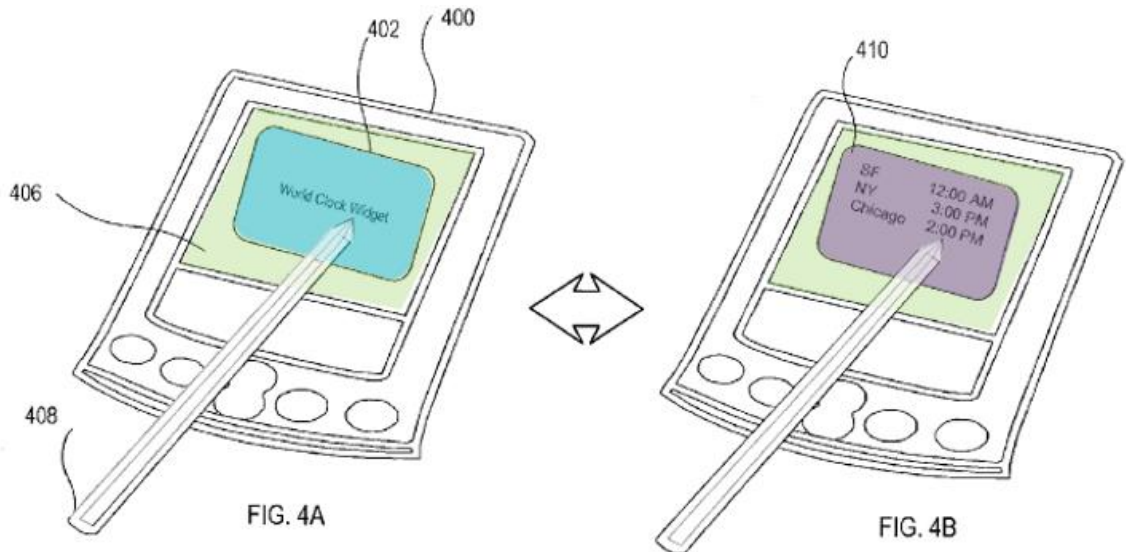
127. Thus, it is my opinion that Louch discloses a wristwatch wherein each card shows a particular function of the wristwatch.

b. Claim 3: The wristwatch of claim 2, wherein each card defines the behavior of the touch-sensitive glass interface and the functions or modules that are to be launched depending on the movements of the finger on the card.

128. In my opinion, Louch teaches Claim 3.

129. Louch describes using a touchscreen to interact with widgets. Louch states, “Users can interact with . . . widgets using a variety of integrated or external input devices.” Ex-1005 ¶39. Louch further teaches, “A typical input device for a digital watch would be . . . **a touch sensitive display area 128.**” *Id.* ¶49. Louch describes an example of a world clock widget which the user can touch to cause it to flip over and display information. *Id.* ¶67; *see also id.* ¶87 (describing touching a display or using gestures to “access features of” widgets). Although Figures 4A

and 4B show a PDA, Louch teaches that this interaction also applies to “other types of devices.” *Id.* ¶66. I discuss some of these features, as applied to watches, in my technology background, at ¶¶53-59.



Ex-1005, Figs. 4A-B (annotated).

130. Louch explains that “widgets” are “user interface elements” that “let the user perform common tasks.” *Id.* ¶8. And Louch discloses that “the user can click or touch the dashboard/widget to invoke the widget.” *Id.* ¶80. Thus, a POSITA would have understood that each card or widget defines the behavior of the touchscreen, in that a touch on a widget will be interpreted to invoke that specific widget’s functionality.

131. Thus, it is my opinion that Louch teaches that a widget defines the behavior of the touch-sensitive glass interface and the functions or modules that are to be launched depending on the movements of the finger on the card.

- c. **Claim 4: The wristwatch of claim 2, wherein said cards are arranged in a plurality of levels, wherein the choice of a card within each level is made either by scrolling vertically or by scrolling horizontally, wherein a particular command makes it possible to switch from one level to another.**

132. In my opinion, Louch teaches Claim 4.

133. Louch discloses that the widgets in Louch are “arranged in a plurality of levels.” For example, Louch describes “organizing the widgets or dashboards into one or more groupings.” Ex-1005 ¶77. A POSITA would have understood that each group of widgets is one of the claimed “plurality of levels” in Claim 4. For example, a number of different clock widgets displaying times in different time zones might be organized into a “grouping.”

134. Louch teaches “a particular command makes it possible to switch from one level to another,” as recited in Claim 4. Louch describes “defining at least one characteristic for each grouping (e.g., name, a common type, a user defined grouping), *receiving input specifying presentation of the widgets or dashboards as a group and, in response to the input, presenting the widgets or dashboards as a group.*” *Id.* This input, in response to which particular group of widgets is presented, is “a particular command [that] makes it possible to switch from one level [i.e., one group of widgets] to another,” as recited in Claim 4. For example, Louch discloses that “widgets sharing one or more characteristics are placed in a stack 500

in the display area 503 of a device 504.” *Id.* ¶78. Thus, a POSITA would have understood that a scrolling gesture to select a particular stack to display would be an example of an “input” in response to which the widgets of a particular “level” are displayed as a group and that scrolling to a different stack would switch from one level to another.

135. And for the same reasons described above for Element 1[e] (Section VIII.A.1.f), Louch teaches “the choice of a card within each level is made either by scrolling vertically or by scrolling horizontally.”

136. Moreover, arranging cards by related groups (levels) and providing scrolling commands in two directions for moving between them was well known. For example, U.S. Patent Publication No. 2009/0199241 (“Unger”) discloses a graphical user interface menu for selecting a broadcast channel that is organized in multiple levels. Ex-1019, Fig. 1 (below).

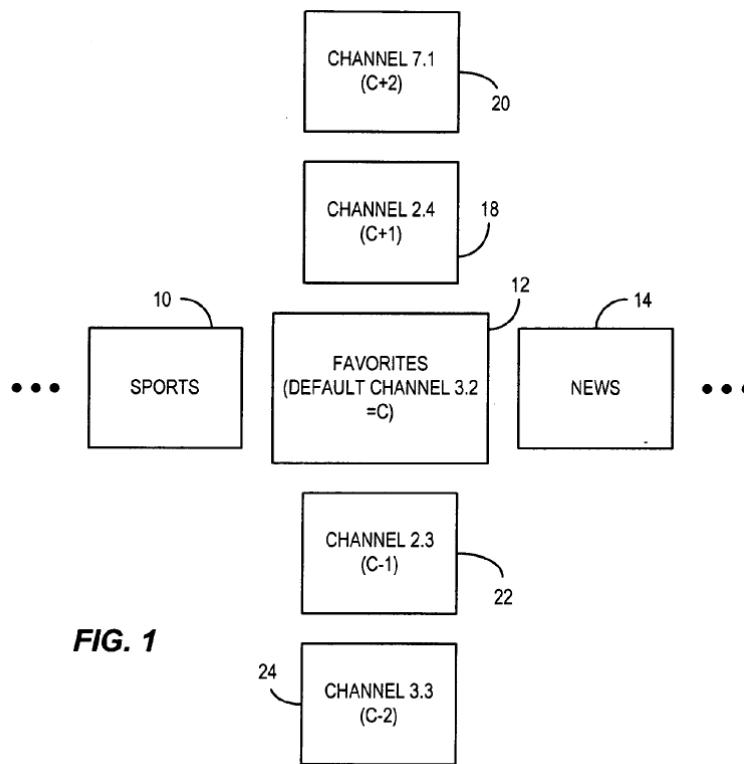


FIG. 1

137. Figure 1, above, depicts an arrangement of channel groups along a horizontal direction, including sports, favorites, and news. Each of these groups is a “level” or group of related channels. Navigating within one level involves scrolling vertically up or down (e.g., to channel C-1 or C+1), while switching between levels is performed by scrolling horizontally right or left (e.g., to sports or news). Thus, a POSITA would have been familiar with organizing material this way and would have understood Louch’s disclosure of groups to disclose this limitation.

138. Thus, it is my opinion that Louch teaches that the choice of a card within each level is made either by scrolling vertically or by scrolling horizontally, wherein a particular command makes it possible to switch from one level to another.

- d. **Claim 6: The wristwatch of claim 1, wherein the processing circuit being laid out for detecting simultaneous contacts on several points of the touch-sensitive glass so as to constitute a multi-touch haptic screen.**

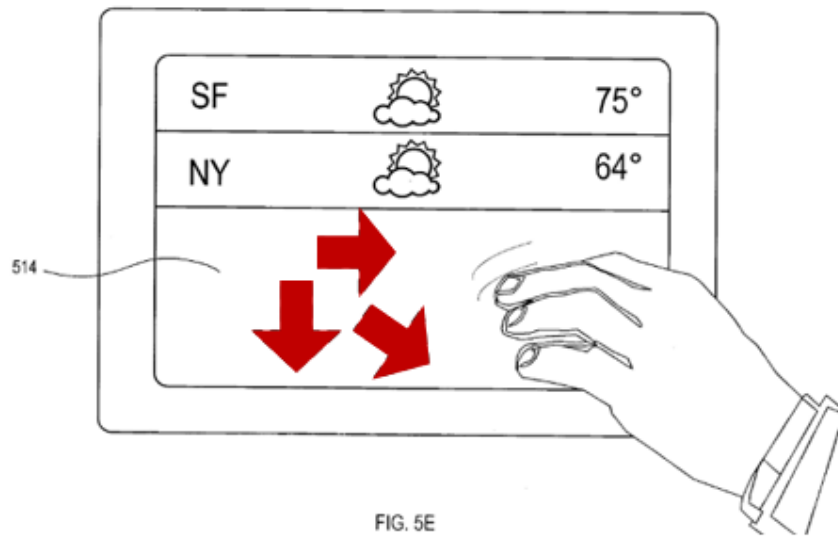
139. In my opinion, Louch teaches Claim 6.

140. Louch discloses “a user interface include[ing] *a multi-touch-sensitive display area* for displaying representations of widgets, wherein at least one of the widget representations is *responsive to multi-touch input*.” Ex-1005 ¶20; *see also id.* ¶81 (same).

141. A POSITA would have recognized the term “haptic” to mean “relating to or based on the sense of touch,” as defined in the Merriam-Webster Dictionary (online). Ex-1015 (Merriam-Webster.com Dictionary, Merriam-Webster, <https://www.merriam-webster.com/dictionary/haptic>. Accessed 27 Sept. 2023).

142. Indeed, the ‘922 Patent uses the term “haptic screen or surface” to mean touchscreen: “A multi-touch surface is understood in the present application to refer to a haptic surface or touch screen capable of detecting several simultaneous contact points, for example simultaneous movements of several fingers on the haptic surface.” Ex-1001, 2:64-3:1; *see also id.*, 2:18-21 (“By comparison with zero-dimensional systems that react to the absolute position of the finger, haptic systems detecting the movement and/or the trajectory of the finger afford the advantage of a more ergonomic use.”); 2:63-64 (“multi-touch (or multi-haptic) surfaces”). So, in

other words, Louch discloses a “multi-touch haptic screen.” This functionality is shown by Figure 5E, which “illustrates an exemplary *multi-touch-sensitive display* 514 for interacting with dashboards and/or widgets.” *Id.* ¶87.



Ex-1005, Fig. 5E (annotated).

143. And Louch incorporates by reference in its entirety Hotelling, for “Multipoint Touchscreen,” which describes multi-touch-sensitive display technology. *Id.* ¶43.

144. Thus, it is my opinion that Louch teaches a processing circuit being configured to detect simultaneous contacts on several points of the touch-sensitive glass so as to constitute a multi-touch haptic screen.

- e. **Claim 7: The wristwatch of claim 1, wherein the processing circuit being laid out for determining the displacement of the center of gravity of the contact zone of the finger on the touch-sensitive glass.**

145. In my opinion, Louch teaches Claim 7.

146. Louch incorporates by reference in its entirety Hotelling for its description of “multi-touch-sensitive display technology.” Ex-1005 ¶43. Hotelling’s multi-touch display discloses a sensing circuit that performs a centroid calculation to determine the central point of a touch region on a touch screen. *See* Ex-1006 ¶56 (“The touch screen 70 may include a sensing circuit 76 that acquires the data from the sensing device 72 and that supplies the acquired data to the processor 56 The sensing circuit 76 may perform filtering and/or conversion processes The conversions ***may include determining the center point for each touch region*** (e.g., centroid).”); *see also id.* ¶¶101-04 (explaining the calculation of a centroid). This process is shown in Hotelling’s Figures 17A-E:

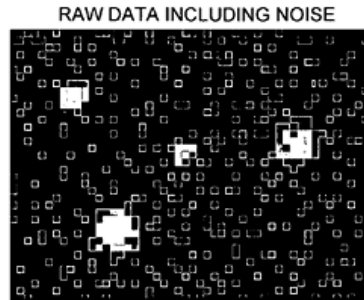


FIG. 17A

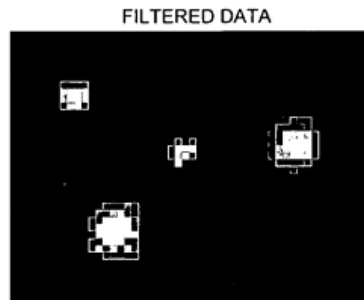


FIG. 17B

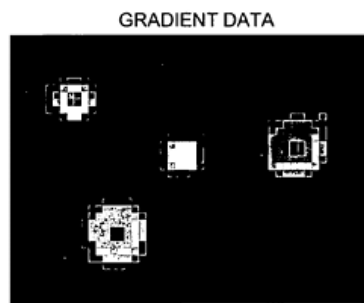


FIG. 17C

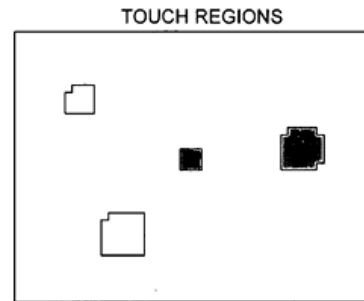


FIG. 17D

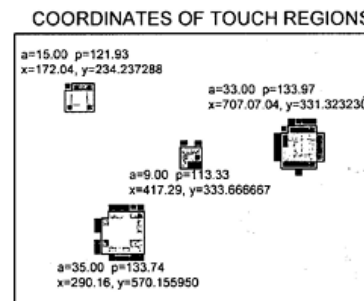


FIG. 17E

147. A POSITA would have understood that a centroid is the geometric center of an object or shape (such as the “raw” touch points depicted above), which corresponds to the center of gravity. While a center of gravity of an object could in general be different from a geometric center in the case of a solid or shape of non-uniform density, a POSITA would have understood that in the context of a fingertip touching a screen, the fingertip contact area has a largely uniform density and that its “center of gravity” would be essentially the same as the geometric center of the

fingertip contact area. For example, Howard Anton's book, CALCULUS (Anton Textbooks, Inc., 1984) illustrates the calculation of a center of gravity for an object having a homogenous density and shows that it is equivalent to its centroid. Ex-1013, 1016 ("Because the density function δ is constant for the homogenous lamina, the factor δ may be moved through the integral signs in (14a) and cancelled."). So a POSITA would also have understood the '922 Patent's reference to a "center of gravity" to be referring to a centroid or geometric center of an object contacting a touch screen in the context of the claims.

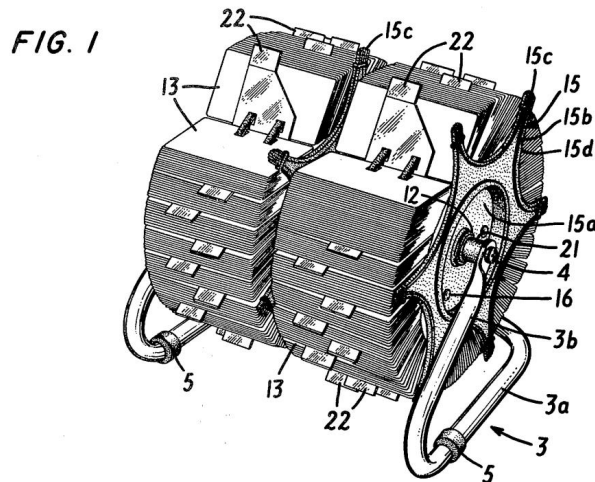
148. Thus, it is my opinion that Louch discloses determining the displacement of the center of gravity of the contact zone of the finger on the touch-sensitive glass.

f. Claim 8: The wristwatch of claim 1, wherein said several available cards are organized in a virtual closed loop row or in a virtual closed loop column.

149. In my opinion, Louch teaches Claim 8.

150. The '922 Patent indicates that a closed loop requires that the last card lead back to the first card: "The cards of the row 22 and/or of the column 21 can advantageously be organized in closed loops; continuing to scroll beyond the last card will thus lead back to the first one and vice-versa. The user therefore has the impression of cyclically running through cards arranged on the surface of a rotating cylinder or sphere." Ex-1001, 8:22-27.

151. Similarly, with reference to Figure 5E, Louch states that “widgets will be continuously scrolled by the display 514 in a Rolodex® manner.” Ex-1005 ¶87. A POSITA would have known that a Rolodex scrolls through cards in a continuous loop in which the last card is replaced by the first card.



Ex-1009, Fig. 1. For example, in the rotary Rolodex directory depicted above, contact cards could be organized alphabetically in A-Z order. Once the card file has rotated through the Z cards and rotation continues in the same direction, the A cards would reappear, such that the contact cards scroll in a continuous loop. A POSITA would have understood that Louch's description of scrolling through widgets in a Rolodex manner means that they are organized in a continuous loop in which the last card is replaced by the first.

152. Louch further discloses that scrolling can be horizontal or vertical. Ex-1005 ¶¶80, 87). Thus, a POSITA would have understood that the virtual closed loop could be oriented in either a horizontal “row” or vertical “column.” Thus, it is

my opinion that Louch discloses that several available cards can be organized in a virtual closed loop row or in a virtual closed loop column.

3. Independent Claim 9

- a. Element 9[pre]: A method for replacing an initially displayed card displayed by a wristwatch by a replacement card, the method having the following steps**

153. In my opinion, Louch teaches the preamble of Claim 9, to the extent it is limiting.

154. Louch discloses “a wristwatch” for the same reasons described above for Element 1[preamble] (§VIII.A.1.a), and Louch discloses “replacing an initially displayed card displayed by a wristwatch by a replacement card” for the same reasons described above for Elements 1[c] (§VIII.A.1.d) and 1[e] (§VIII.A.1.f). Ex-1020, element 9[pre].

155. Thus, it is my opinion that Louch teaches replacing an initially displayed card displayed by a wristwatch by a replacement card.

- b. Element 9[a]: detecting a direction of a movement of at least one finger at any place and along at least two different directions on a two-dimensional touch-sensitive glass**

156. In my opinion, Louch teaches the Element 9[a], to the extent it is limiting.

157. The limitations of Element 9[a] are included in Elements 1[b] and [d] of Claim 1. Ex-1020, Element 9[a].

158. Thus, it is my opinion that Louch teaches detecting a direction of a movement of at least one finger at any place and along at least two different directions on a two-dimensional touch-sensitive glass.

- c. **Element 9[b]: [1] scrolling on a digital matrix display of several available cards so as for said scrolling to stop of itself so as to align an edge of the replacement card with an edge of the matrix display, [2] wherein one card of said several available cards and occupying the entire digital matrix display is replaced after the scrolling, immediately and without further user intervention, by a different card selected between said several available cards and occupying the entire digital matrix display; [3] and wherein the scrolling direction depends only on the direction of said movement so that said replacement card is dependent from the initially displayed card and from the direction of said movement and is independent from the starting point and end point of said movement on said digital matrix display**

159. In my opinion, Louch teaches the Element 9[b].

160. Most of the limitations of Element 9[b] are included in Elements 1[e]-1[h] of Claim 1. Portions of element 9[b][1] corresponds to Element 1[e]; Element 9[b][2] corresponds to Elements 1[f] and 1[g]; Element 9[b][3] corresponds to Element 1[h]. Ex-1020, element 9[b].

161. The remaining portion of element 9[b][1] is “said scrolling to stop of itself so as to align an edge of the replacement card with an edge of the matrix display,” which is disclosed by Louch. Louch states, “[T]he user can make a single touch and gesture and widgets will be continuously scrolled by the display 514 in a Rolodex® manner and slowly decelerate to a stop.” Ex-1005 ¶¶87. Because each widget can fill the screen entirely (*id.* ¶¶67, 80-81), when the scrolling stops, a POSITA would have understood that it would stop in a position in which its edges would be aligned with the edges of the display, so that the replacement widget is fully visible and not sharing the display with part of another widget. Because Louch discloses that each widget can fill the screen entirely (*id.* ¶¶67, 80-81, Claim 27), stopping between widgets would be contrary to this teaching because neither widget would be filling the screen entirely in such as case. Moreover, it would have been obvious to a POSITA to ensure that when scrolling stops, a widget would be aligned with the edges of the screen because that would present the best user experience and allow the user to unambiguously launch a program or service associated with the widget by touching it without inadvertently touching an adjacent widget.

162. Thus, it is my opinion that Louch teaches scrolling on a digital matrix where the scrolling stops itself so as to align an edge of the replacement card with an edge of the matrix display, wherein a card occupying the entire digital matrix display is replaced after the scrolling, immediately and without further user

intervention, and wherein the scrolling direction depends only on the direction of said movement so that said replacement card is dependent from the initially displayed card and from the direction of said movement and is independent from the starting point and end point of said movement on said digital matrix display.

- d. Element 9[c]: [1] lastingly displaying the replacement card on the whole of said digital matrix display, wherein each card of said several available cards has a distinct fixed or periodically refreshed image, [2] the size of the images corresponding to the size of said digital matrix display.**

163. In my opinion, Louch teaches the Element 9[c], to the extent it is limiting.

164. Element 9[c][1] corresponds to Element 1[e] and Element 9[c][2] corresponds to Element 1[f]. Ex-1020, element 9[c]. Accordingly, Louch discloses Element 9[c] for the reasons explained above for Elements 1[e]-1[f] (§VIII.A.1.f-g).

165. Thus, it is my opinion that Louch teaches lastingly displaying the replacement card on the whole of said digital matrix display, wherein each card of has a distinct fixed or periodically refreshed image where the size of the images corresponding to the size of said digital matrix display.

4. Dependent Claims 10-19, 21-22

- a. Claim 10: The method of claim 9, further including the entering of a touch command for confirming or stopping the scrolling.**

166. In my opinion, Louch teaches Claim 10.

167. Louch discloses that a user can scroll through widgets/cards “by touching the widgets and making the appropriate finger gestures in horizontal or vertical directions.” Ex-1005 ¶80; *see also* (§VIII.A.1.f). It would have been understood by a POSITA that the finger gestures for scrolling include moving a finger on the touchscreen to start scrolling and holding a finger in place on the touchscreen to stop the scrolling. Moving a finger is a “touch command” for confirming the scrolling, and holding a finger in place is a “touch command” for stopping the scrolling.” Furthermore, Louch discloses that, in some embodiments, “[w]hen a desired dashboard/widget is found, the ***user can click or touch the dashboard/widget to invoke the widget.***” *Id.* ¶80. Such a touch to invoke the widget is also a “touch command” to stop the scrolling.”

168. Moreover, it would have been obvious to a POSITA that the finger gestures for scrolling include moving a finger on the touchscreen to start scrolling and holding a finger in place to stop the scrolling. It would have also been obvious to touch a widget to stop the scrolling. This is exactly analogous to operating a physical Rolodex rotary directory, which is a user experience Louch’s system seeks to recreate. *Id.* ¶87. For example, with a Rolodex, a user can use a finger (or hand) to rotate the directory to cause cards to flip by, and a user can hold the finger (or hand) in place to stop the cards. And if the user spins the directory, the user can also put a finger (or hand) back on the spinning directory to stop the scrolling at the

currently displayed card. Thus a POSITA familiar with basic touch-screen interactions from devices such as PDAs would intuitively understand how to enter touch commands such as holding a finger in place or touching a widget as it scrolls by in order to confirm or stop the scrolling.

169. Thus, it is my opinion that Louch teaches entering of a touch command for confirming or stopping the scrolling.

b. Claim 11: The method of claim 9, further comprising the detecting of simultaneous contacts on several points of the two-dimensional touch-sensitive glass.

170. In my opinion, Louch teaches Claim 11 for the same reasons described above for Claim 6 (§VIII.A.5). Ex-1020, claim 11.

c. Claim 12: The method of claim 9, further comprising the determining of the displacement of the center of gravity of the contact zone of the finger on the two-dimensional touch-sensitive glass.

171. In my opinion, Louch teaches Claim 12 for the same reasons described above for Claim 7 (§VIII.A.6). Ex-1020, claim 12.

d. Claim 13: The method of claim 9, wherein the different cards scroll in continuous fashion on the digital matrix display, the scrolling being interrupted so as to align the edge of a card with the edge of the digital matrix display.

172. In my opinion, Louch teaches Claim 13.

173. As discussed above in Element 1[e](§VIII.A.1.f) and 1[f](§VIII.A.1.g), Louch discloses scrolling widgets (cards) that fill the entire display. *See also*

Ex-1005 ¶¶79-8 (“widgets are scrolled across the display area 502 of the device 504 using a finger or stylus”) ¶67 (widget “can consume the entire display area 406”).

174. Louch further describes that the widgets scroll “in continuous fashion.” Louch states that “widgets will be *continuously* scrolled by the display 514 in a Rolodex® manner and slowly de-accelerate to a stop.” *Id.* ¶87.

175. A POSITA would have recognized that this description of scrolling widgets “in a Rolodex® manner” means that the scrolling is “interrupted so as to align the edge of a card with the edge of the digital matrix display.” In a Rolodex, when the scrolling of cards is stopped, an individual card is shown. Because Louch discloses that the widgets scroll in this “Rolodex® manner,” when the scrolling of widgets is stopped, an individual widget is shown. Because the widget fills the entire display, the edge of a widget “align[s] with the edge of the digital matrix display” as recited in Claim 13.

176. Furthermore, Louch states, “When a desired dashboard/widget is found, the user can click or touch the dashboard/widget to invoke the widget. In some implementations, when the dashboard/widget is invoked the dashboard/widget is displayed to cover the entire display area 502 (full screen).” *Id.* ¶80. Because the widget covers the entire display, the edge of a widget “align[s] with the edge of the digital matrix display” as recited in Claim 13.

177. Thus, it is my opinion that Louch teaches that different cards can scroll in continuous fashion on the digital matrix display, the scrolling being interrupted so as to align the edge of a card with the edge of the digital matrix display.

e. Claim 14: The method of claim 13, wherein the card scrolling speed or amplitude depend on the speed or amplitude of movement of the finger on the two-dimensional touch-sensitive glass.

178. In my opinion, Louch teaches Claim 14.

179. Louch explicitly states: “Scrolling can be horizontal, vertical and diagonal. The *speed of the scrolling is controlled by the speed of the finger gestures* made by the user.” Ex-1005 ¶87.

180. Thus, in my opinion, Louch teaches that the card scrolling speed or amplitude depend on the speed or amplitude of movement of the finger on the two-dimensional touch-sensitive glass.

f. Claim 15: The method of claim 14, wherein the card scrolling speed is variable, the scrolling being slowed down before stopping completely.

181. In my opinion, Louch teaches Claim 15.

182. Louch discloses variable scrolling speed because “[t]he speed of the scrolling is controlled by the speed of the finger gestures made by the user.” Ex 1005 ¶87. Louch also discloses various scrolling animations that “give the impression of friction or other properties.” Ex-1005 ¶87. For example, Louch states that “the user can make a single touch and gesture and widgets will be continuously

scrolled by the display 514 in a Rolodex® manner and slowly de-accelerate to a stop.” *Id.* ¶87.

183. Thus, in my opinion, Louch teaches that the card scrolling is variable, the scrolling being slowed down before stopping completely.

g. Claim 16: The method of claim 15, wherein the card scrolling speed is variable, the scrolling being slowed down each time a card is switched to another one.

184. In my opinion, Louch teaches Claim 16.

185. Louch discloses “the card scrolling speed is variable” for the same reasons described above for Claim 15 (§VIII.A.14).

186. Louch also discloses “the scrolling being slowed down each time a card is switched to another one” as recited in Claim 16. Louch states that widgets scroll “in a Rolodex® manner and slowly de-accelerate to a stop.” Ex-1005 ¶87. In a Rolodex, the cards flip one after the other. The movement is faster before each card is flipped than after each card is flipped, to give appearance of friction in an actual Rolodex. In other words, the scrolling is “slowed down each time a card is switched to another one” as recited in Claim 16. A POSITA would have understood that Louch’s disclosure of scrolling in a Rolodex manner would have included slowing down each time a card is switched because that would both imitate the behavior of a Rolodex directory and also would give the user time to see and recognize the card as it scrolls by.

187. Thus, in my opinion, Louch teaches that the card scrolling speed is variable, the scrolling being slowed down each time a card is switched to another on.

h. Claim 17: The method of claim 13, wherein the card scrolling is interrupted by a brief pressure on the two-dimensional touch-sensitive, so as to cause the card best centered on the display at the time of the interruption to be selected and displayed.

188. In my opinion, Louch teaches Claim 17.

189. Louch discloses “the card scrolling is interrupted by a brief pressure on the two-dimensional touch-sensitive” for the reasons described above for Claim 10 (§VIII.A.9).

190. Louch further states that, when scrolling, “the user can click or touch the dashboard/widget to invoke the widget” and that invoking the widget can cause it to “to cover the entire display area 502 (full screen).” Ex-1005 ¶79. A POSITA would have understood that, when scrolling widgets that fill the entire display, the touch of the display described in Louch involves the “best centered” widget being selected and displayed. This is analogous to operating a physical Rolodex rotary directory, which is a user experience Louch’s system seeks to recreate. *Id.* ¶87. For example, with a Rolodex, a user can use a finger (or hand) to spin the directory, causing cards to flip by, and then the user can put a finger (or hand) on the spinning directory to stop the scrolling at the currently displayed card. If a card is partway

through a flip when the Rolodex is stopped, it will either complete its flip and be displayed, or be snapped back to allow the previous card to be displayed. Thus a POSITA familiar with basic touch-screen interactions from devices such as PDAs would intuitively understand how to put brief pressure on the touchscreen to stop the scrolling of Louch's cards because that is the same operation the user would perform to stop a physical Rolodex at a selected card. Thus, Louch teaches "the card best centered on the display at the time of the interruption to be selected and displayed."

191. Thus, in my opinion, Louch teaches that card scrolling can be interrupted by a brief pressure on the two-dimensional touch-sensitive, so as to cause the card best centered on the display at the time of the interruption to be selected and displayed.

i. Claim 18: The method of claim 9, wherein the size of the displayed cards is reduced during scrolling, so as to display several cards simultaneously.

192. In my opinion, Louch teaches Claim 18.

193. Louch's Figure 5D shows the size of the widgets/cards can be "reduced during scrolling" so that the display can show several cards simultaneously. Ex-1005 ¶¶79, 86. To the extent that Figure 5D only shows the size of the widget/card increasing, a POSITA would have recognized that if the user moved their finger upwards (in the opposite direction of the illustrated Motion Path), then the widget/card size would have decreased. Furthermore, it would have been obvious

to a POSITA that if moving a finger in one direction increased the size of widgets/cards, then moving that finger in the other direction would decrease the size of the widgets/cards.

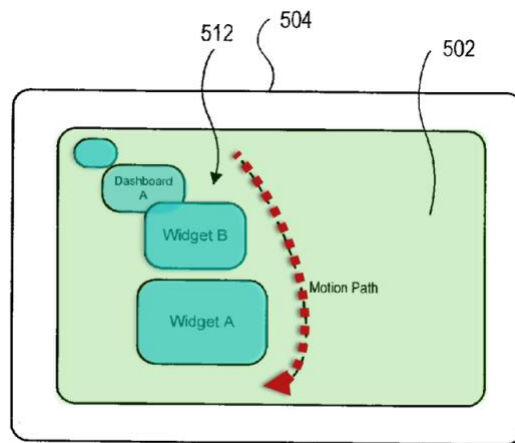


FIG. 5D

Ex-1005, Fig. 5D (annotated).

194. Thus, in my opinion, Louch teaches the size of the displayed cards can be reduced during scrolling, so as to display several cards simultaneously.

- j. **Claim 19: The method of claim 9, wherein said cards are arranged in a plurality of levels, wherein the method comprises a step of vertical or horizontal scrolling and a step of entering a particular command for switching from one level to another.**

195. In my opinion, Louch teaches Claim 19 for the same reasons described above for Claim 4 (§VIII.A.4). Ex-1020, Cl. 19.

- k. Claim 21: The method of claim 9, wherein said several available cards are organized in a virtual closed loop row or in a virtual closed loop column.**

196. In my opinion, Louch teaches Claim 21 for the same reasons described above for Claim 8 (§VIII.A.7). Ex-1020, Cl. 21.

- l. Claim 22: The method of claim 9, wherein said several available cards are organized in a virtual closed loop row and in a virtual closed loop column.**

197. In my opinion, Louch teaches Claim 22 for the same reasons described above for Claim 8 (§VIII.A.7). Ex-1020, Cl. 22. Louch discloses that “scrolling can be horizontal, vertical, and diagonal.” Ex-1005 ¶87. Thus, Louch also teaches that widgets (cards) can be organized in both virtual closed loop row and a virtual closed loop column.

198. Thus, in my opinion, Louch teaches that cards can be organized in a virtual closed loop row and in a virtual closed loop column.

5. Independent Claims 23-24

- a. Element 23[pre]: A wristwatch having**
Element 24[pre]: A wristwatch having

199. In my opinion, Louch teaches the preambles of Claims 23-24, to the extent they are limiting, for the same reasons described above for Element 1[pre] (§VIII.A.1.a). Ex-1020, Elements 23[pre], 24[pre].

b. Element 23[a]: a digital matrix display

Element 24[a]: a digital matrix display

200. In my opinion, Louch teaches the Elements 23[a] and 24[a] for the same reasons described above for Element 1[a] (§VIII.A.1.b). Ex-1020, Elements 23[a], 24[a].

c. Element 23[b]: a sheet of touch-sensitive glass

Element 24[b]: a sheet of touch-sensitive glass

201. In my opinion, Louch teaches the Elements 23[b] and 24[b] for the same reasons described above for Element 1[b] (§VIII.A.1.c). Ex-1020, Elements 23[b], 24[b].

a. Element 23[c]: a processing circuit specifically laid out so as to interpret the signals from the touch-sensitive glass, for selecting a card from several available cards depending on these signals and for displaying said card on the entire digital matrix display, wherein each card has a distinct fixed or periodically refreshed image

Element 24[c]: a processing circuit specifically laid out so as to interpret the signals from the touch-sensitive glass, for selecting a card from several available cards depending on these signals and for displaying said card on the entire digital matrix display

202. In my opinion, Louch teaches the Elements 23[c] and 24[c] for the same reasons described above for Elements 1[c] (§VIII.A.1.d) and 1[e] (§VIII.A.1.f). Ex-1020, elements 23[c], 24[c].

- b. Element 23[d]: wherein said touch-sensitive glass is a two-dimensional glass for detecting a movement of at least one finger at any place on the touch-sensitive glass along at least two different directions**

Element 24[d]: wherein said touch-sensitive glass is a two-dimensional glass for detecting a movement of at least one finger at any place on the touch-sensitive glass along at least two different directions

203. In my opinion, Louch teaches the Elements 23[d] and 24[d] for the same reasons described above for Element 1[d] (§VIII.A.1.e). Ex-1020, Elements 23[d], 24[d].

- c. Element 23[e]: wherein said processing circuit is specifically laid out so as to cause said several available cards to scroll past by displaying the image of said cards one at a on the digital matrix display in order to lastingly replace the initially displayed card with a replacement card selected within said several available cards, immediately after the scrolling and without further user intervention**

Element 24[e]: wherein said processing circuit is specifically laid out so as to cause cards to scroll past in order to lastingly replace the initially displayed card with a replacement card, wherein each card has a fixed or periodically refreshed image

204. In my opinion, Louch teaches the Elements 23[e] and 24[e] for the same reasons described above for Elements 1[e] (§VIII.A.1.f) and 1[g] (§VIII.A.1.h). Ex-1020, elements 23[e], 24[e].

205. Element 23[e] further requires “displaying the image of said cards one at a [time] on the digital matrix display,” which is also disclosed by Louch. Louch’s

dependent claim 26 teaches “the widgets are scrolled so that one widget is displayed at a time,” and dependent Claim 27 teaches “the one displayed widget consumes substantially the entire display.” Louch teaches that a widget may “consume the entire display area.” Ex-1005 ¶67. Louch also discloses that “the user can make a single touch and gesture and widgets will be continuously scrolled by the display 514 in a Rolodex® manner and slowly decelerate to a stop.” *Id.* ¶87.

206. Thus, in my opinion, Louch discloses that the scrolling can slow to a stop without further user intervention. During such scrolling, one card/widget would “immediately after the scrolling and without further user intervention” replace another card/widget.

d. Element 23[f]: wherein the size of the image corresponds to the size of said digital matrix display so that the displayed card occupies the whole of said digital matrix display

Element 24[f]: wherein the size of the image corresponds to the size of said digital matrix display so that the displayed card occupies the whole of said digital matrix display

207. In my opinion, Louch teaches the Elements 23[f] and 24[f] for the same reasons described above for Element 1[f] (§VIII.A.1.g). Ex-1020, elements 23[f], 24[f].

- e. **Element 23[g]: wherein said processing circuit is further laid out so that the replacement card is dependent from the initially displayed card and from the direction of said movement and is independent from the starting point and end point of said movement on said digital matrix display.**

Element 24[g]: wherein said processing circuit is further laid out so that the replacement card is dependent from the initially displayed card and from the direction of said movement and is independent from the starting point and end point of said movement on said digital matrix display; and

208. In my opinion, Louch teaches the Elements 23[g] and 24[g] for the same reasons described above for Element 1[h] (§VIII.A.1.i). Ex-1020, elements 23[g], 24[g].

- f. **Element 24[h]: wherein said several available cards are organized in a virtual closed loop row and in a virtual closed loop column**

209. In my opinion, Louch teaches Element 24[h] for the same reasons described above for Claim 22 (§VIII.A.5.1). Ex-1020, element 24[h].

B. Ground 2: Claims 5 and 20 are obvious over Louch in view of Hepp.

- 1. **A POSITA would be motivated to combine Louch and Hepp's teachings and would have a reasonable expectation of success.**

210. A POSITA would have been motivated to combine the teachings of Louch and Hepp and would have had a reasonable expectation of success in doing so because both Louch and Hepp are directed to touchscreen display devices.

211. Like Louch, Hepp describes touchscreens. Ex-1007, 5:60-63; 7:32-36. Both also describe using the touchscreen to display representations of time. Ex-1005 ¶¶35, 58, 67, 68, 70, Figs. 4A and 4B; Ex-1007, 4:46-50, 6:63-7:5. Hepp further discloses displaying the time on a touchscreen display by simulating a mechanical watch with clock hands. Ex-1007, 4:55-58, 6:27-31, 6:66-7:5.

212. It would have been obvious to apply the teaching of Hepp (to display time by simulating a mechanical watch with clock hands) to the world clock widget in the wristwatch of Louch. For one thing, although many variations exist, a mechanical clock or watch with hour and minute hands, such as taught by Hepp, is one of two of the most common ways to represent time, the other being a digital HH:MM:SS representation. Using Hepp's mechanical clock would have been an obvious design choice. As further motivation for such a combination, Hepp teaches that this representation of time is "adapted to the acquired human sense of orientation in time in an optimum way." Ex-1007, 6:27-31. Because humans are adapted to this traditional representation of time, design incentives and market forces would have motivated a POSITA to apply the teachings of Hepp to the world clock widget of Louch with predictable results.

213. A POSITA would have had a reasonable expectation of success in combining Louch and Hepp, because matrix displays can be programmed to display clock hands as taught by Hepp.

2. **Dependent claims 5 and 20**

- a. **Claim 5: The wristwatch of claim 4, wherein at least one of said cards makes it possible to calculate and display a simulation of a mechanical watch displaying the time, so as to enable the user to change the mechanical watch displayed by scrolling cards.**

214. In my opinion, Louch in view of Hepp teaches Claim 5.

215. Louch discloses a “world clock widget” (Ex-1005 ¶58), which a POSITA would understand to be a calculated and displayed representation of time. Hepp discloses displaying an analog clock-face with hands on a LCD touchscreen in its Figure 1. Ex-1007, 4:55-58 (“In FIG. 1, representation of time is a circular dial 3 *with hands 4 depicted in a continuously variable way.*”).

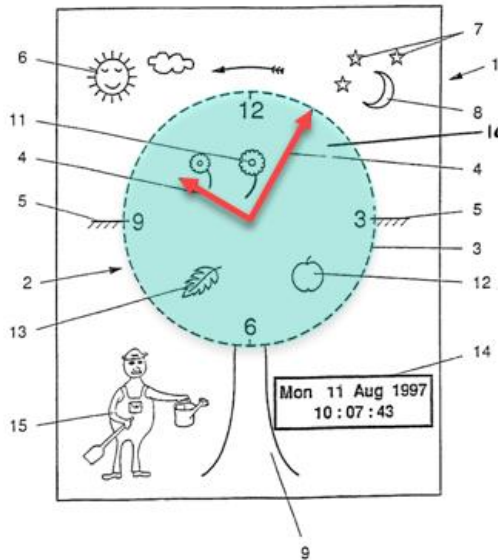


Fig. 1

Ex-1007, Fig. 1 (annotated).

216. As Hepp recognizes, this “use of two hands in an analog manner” simulates a mechanical clock. *Id.*, 2:1-2. It would have been obvious to a POSITA to apply this teaching to the world clock widget in the wristwatch in Louch, which already calculates and displays a representation of the time. Thus, Louch-Hepp teaches “at least one of said cards makes it possible to calculate and display a simulation of a mechanical watch displaying the time,” as recited in Claim 5.

217. The combination also teaches enabling the user to change the mechanical watch displayed by scrolling cards. Given Louch’s teaching of scrolling to switch cards as explained in Elements 1[c]-[d] (§VIII.A.1.d-e), a POSITA would have understood Louch-Hepp to also teach that different mechanical watch simulations could be displayed by scrolling cards. In fact, Hepp discloses multiple pages may include different representations of time. Ex-1007, 8:51-52 (first page with “clock”), 8:60-61 (seventh page with “personalized time representations”). Hepp also describes touching the display to changes pages. *Id.*, 8:35-36. A POSITA would have recognized that one of the benefits of a watch with an LCD screen is the ability to easily change the look of the display and would have been motivated to make Hepp’s different representations of time available to the user through Louch’s scrolling card interface.

218. Thus, it is my opinion that Louch in view of Hepp teaches that at least one of said cards could calculate and display a simulation of a mechanical watch

displaying the time, so as to enable the user to change the mechanical watch displayed by scrolling cards.

b. Claim 20: The method of claim 9, wherein a plurality of said cards displays a simulation of a virtual mechanical movement.

219. In my opinion, Louch in view of Hepp teaches Claim 20 for the same reasons described above for Claim 5 (§VIII.B.2.a). Ex-1020, claim 20.

C. Ground 3: Claims 8, 13-17, 21, 22, and 24 are obvious over Louch in view of Duarte.

1. A POSITA would be motivated to combine Louch and Duarte's teachings and would have a reasonable expectation of success.

220. A POSITA would have been motivated to combine the teachings of Louch and Duarte and would have had a reasonable expectation of success in doing so because each relates to the same well-known technologies. Like Louch, Duarte describes touchscreens on small devices (such as the wristwatch of Louch) that users can swipe horizontally or vertically to move cards (called windows 301) organized in rows and/or columns. Ex-1010, 5:16-18, 5:38-41, 6:59-7:17, 7:44-8:4. Duarte describes enhancements to the visual simulations of scrolling through cards. For example, Duarte describes several transition effects, such as closed-loop scrolling and snap-into-place. Ex-1010, 7:6-17, 8:17-22. It would have been obvious that these transition effects could apply to the scrolling of widgets in Louch because both Duarte and Louch disclose scrolling through cards, and Duarte's visual effects would

have been compatible with the visual representations disclosed by Louch. A POSITA would have been motivated to add these visual transition effects to make it easier for a user to find and display a desired widget. For example, closed-loop scrolling would provide a quicker mechanism to navigate from the last widget to the first widget and vice versa. A POSITA would also have realized that Duarte's snap-into-place feature would more quickly allow a user to automatically center a widget as opposed to manually manipulating it back and forth. All of these would lead to a more appealing and better user experience and would have motivated a POSITA to make this combination.

221. A POSITA would have understood that these references disclose interrelated teachings based on routine technologies that would have been amendable to various well-understood and predictable combinations.

2. Dependent claims 8, 13-17, and 21-22

a. Claim 8: The wristwatch of claim 1, wherein said several available cards are organized in a virtual closed loop row or in a virtual closed loop column.

222. Louch in view of Duarte teaches Claim 8.

223. Duarte discloses that, on a small touchscreen of a portable device (like the wristwatch of Louch), the cards (called windows 301 in Duarte) may be scrolled in a closed loop. Ex-1010, 8:17-22. It would have been obvious to a POSITA to

apply Duarte's closed-loop teaching to the scrolling of widgets organized in columns and rows in Louch for the reasons expressed in ¶220.

224. Thus, it is my opinion that Louch in view of Duarte teaches that several available cards can be organized in a virtual closed loop row or in a virtual closed loop column.

- b. Claim 13: The method of claim 9, wherein the different cards scroll in continuous fashion on the digital matrix display, the scrolling being interrupted so as to align the edge of a card with the edge of the digital matrix display.**

225. Louch in view of Duarte teaches Claim 13.

226. Like Louch, Duarte describes scrolling of cards (which Duarte calls windows 301) that fill the entire display of touchscreens. Ex-1010, 6:59-63. Duarte further discloses that, during scrolling, the cards can automatically snap into position upon completion of the scrolling. *Id.*, 7:6-10. When applied to an embodiment in which the scrolling cards fill the entire display, this snap-into-position feature results in “the scrolling being interrupted so as to align the edge of a card with the edge of the digital matrix display” as recited in Claim 13. That is, the scrolling cards slow down (as taught by Louch) and come to a stop such that the last displayed card is aligned on the edge of the display. Doing so would make it clear to the user which card is the replacement card.

227. Thus, it is my opinion that Louch in view of Duarte teaches that cards scroll in continuous fashion on the digital matrix display, the scrolling being interrupted so as to align the edge of a card with the edge of the digital matrix display.

c. Claims 14-16

228. Dependent Claims 14, 15, and 16 depend (directly or indirectly) from Claim 13. As discussed above, the Louch-Duarte combination teaches Claim 13. See *supra* §VIII.C.2.b. Also, as discussed above, Louch discloses or teaches the additional limitations of Claim 14 (*see supra* §VIII.A.5.e), Claim 15 (*see supra* §VIII.A.5.f), and Claim 16 (*see supra* §VIII.A.5.g).

229. Thus, it is my opinion that the Louch-Duarte combination also teaches Claims 14, 15, and 16.

d. Claim 17: The method of claim 13, wherein the card scrolling is interrupted by a brief pressure on the two-dimensional touch-sensitive, so as to cause the card best centered on the display at the time of the interruption to be selected and displayed.

230. As discussed above, the Louch-Duarte combination teaches Claim 13 (*see supra* §VIII.C.2.b), and Louch discloses or teaches the additional limitation of Claim 17 (*see supra* §VIII.A.5.h).

231. Alternatively, Duarte further supports the teaching of the additional limitation of Claim 17.

232. Duarte states, “In one embodiment, if the user drags windows 301 so as to place a window 301 ***sufficiently close to the central position*** to make it clear that the intention is to give the window 301 focus, the window 301 snaps ***into the central position*** upon completion of the drag operation.” Ex-1010, 7:6-10. Duarte teaches that windows 301 can be scrolled in full-screen mode (*id.*, 6:59-63), which means that the window that snaps into the central position is the window that is selected and displayed. Duarte also teach that the window can automatically switch to full-screen mode (*id.*, 6:26-28), which means which means that the window that snaps into the central position is the window that is selected and displayed.

233. Thus, it is my opinion that Duarte teaches the additional limitation of Claim 17, and the Louch-Duarte combination teaches Claim 17.

e. Claims 21-22

234. In my opinion, Louch in view of Duarte also teaches Claims 21 and 22 for the same reasons described above for Claim 8 (§VIII.C.2.a).

235. Because both Louch and Duarte describe scrolling in both horizontal and vertical directions (Ex-1005 ¶87, Ex 1010, 3:44-48, 3:62-65), Louch-Duarte discloses or teaches a virtual closed loop row and column.

3. Independent claim 24

a. Element 24

236. Louch discloses or teaches Claim 24. *See supra* §VIII.A.6.

237. Louch-Duarte also teaches Claim 24. For the reasons explained above for Claim 8 (§VIII.C.2.a) and Claim 22 (§VIII.C.2.e), Duarte provides further support for Element 24[h] “said several available cards are organized in a virtual closed loop row and in a virtual closed loop column.” Ex-1020, Element 24[h].

238. It would have been obvious to apply Duarte’s teaching of closed loop rows and columns to the horizontal and vertical scrolling of widgets in Louch.

D. Ground 4: Claim 23 is obvious over Louch in view of Park.

1. A POSITA would be motivated to combine Louch and Park’s teachings and would have a reasonable expectation of success.

239. A POSITA would have been motivated to combine the teachings of Louch and Park and would have had a reasonable expectation of success in doing so because each relates to the same well-known technologies. Like Louch, Park discloses a portable device with a touchscreen that a user can swipe to scroll though cards (called pages in Park). Ex-1011 ¶34. Park further describes that the cards can be scrolled one page at a time. *Id.* ¶¶44, 55. It would have be obvious to a POSITA to apply this one-page-at-a-time teaching to the scrolling of widget in Louch. For example, although Louch teaches variable speed scrolling based on the speed of the finger (Ex-1005 ¶87), a POSITA would have recognized and found it obvious that at some minimum speed, the scrolling should slow down to one-page at a time scrolling as taught by Park. To the extent necessary, Louch could be improved by

Park's teaching of scrolling one page at a time because a user would be able to see each card or widget as it scrolls by, which would make it easier to recognize each widget and select the desired one.

240. A POSITA would have understood that these references disclose interrelated teachings based on routine technologies that would have been amenable to various well-understood and predictable combinations.

2. Independent Claim 23

241. Louch in view of Park also teaches Claim 23.

242. Park provides further support for Element 23[e]. Park teaches that, in a mobile device with a touchscreen, pages may be scrolled one page at a time. Ex-1011 ¶¶44, 55. It would have been obvious to apply the teachings of Park to scroll one page at a time to the touchscreen of Louch for the reasons discussed above.

E. Ground 5: Claims 1-13 and 17-24 are obvious over the combination of Duarte, Biggs, and Hotelling.

1. A POSITA would be motivated to combine Duarte, Biggs, and Hotelling and would have a reasonable expectation of success.

243. A POSITA would have been motivated to combine the teachings of Duarte, Biggs, and Hotelling and would have had a reasonable expectation of success in doing so because each relates to the same well-known technologies. Duarte describes touchscreens on small devices that users can swipe horizontally or vertically to move cards (called windows 301) organized in rows and/or columns.

Ex-1010, 5:38-41, 6:59-7:17. Biggs discloses a wristwatch with a touch-sensitive LCD display. Ex-1012, 3:64-65, 9:7-16. Biggs further discloses that users can customize various time displays and choose which display appears on the LCD screen. Ex-1012, 3:43-48, 7:6-12, 8:60-65. Hotelling describes a multitouch touchscreen allowing a user to interact with a graphical user interface on a LCD display. Ex-1006 ¶37.

244. It would have been obvious to a POSITA to apply the teachings of Duarte, which involve scrolling through available windows on a touchscreen, to the touchscreen wristwatch of Biggs with its selectable customized time displays. Duarte teaches that its invention is intended for devices with small screens like the watch in Biggs. Ex-1010, 2:26-52 (“Mobile devices such as Smartphones, personal digital assistants, music players, handheld computers, and the like are becoming increasingly powerful. ... [M]ost such devices have extremely small screens, when compared to laptop or desktop computers.”). A POSITA would have been motivated to use a touchscreen to avoid an additional input device separate from the display. Moreover, Biggs discloses a watch with a touchscreen interface and a processor coupled to Bigg’s “high resolution LCD display.” Ex-1010, 3:52-65. Thus, a POSITA would have expected that Duarte’s processor, touchscreen interface, and display would be compatible with Biggs’s watch form factor because Biggs already includes a processor controlling a high resolution LCD screen with touch capability.

Therefore, a POSITA would have expected such a combination to be successful. In addition, watches with touch sensitive screens were already well known in the art. *See, e.g.*, Ex-1014 (Fitzgerald), 3:18-26; Figs. 1A-1B; Ex-1005 (Louch), ¶49, Fig. 1F. I discussed other examples of watches and devices with small, touch-sensitive LCD screens in my technology background, at ¶¶51-58. Thus, the combination of Duarte and Biggs would have naturally appealed to a POSITA who would have expected such a combination to be successful. Furthermore, a POSITA would have understood that interacting with a touchscreen to scroll through several saved customized time displays is a more natural and thus more desirable interface for users than downloading a new display each time the user wishes for a change. Thus, design incentives and market forces would have motivated a POSITA to combine the teachings of Duarte and Biggs.

245. It would have been obvious to further apply the teachings of Hotelling to implement the touchscreen in Duarte and Biggs. Like Duarte and Biggs, Hotelling discloses a LCD display with a touchscreen. Ex-1006 ¶37. Hotelling further discloses that a touchscreen could include a glass member or protective coversheet made of glass to protect a LCD display from forces exerted on the touchscreen. *Id.* ¶¶71-72. In implementing a wristwatch with a touchscreen as taught by Biggs, a POSITA would have been motivated to use a touchscreen with glass to protect the LCD display as taught in Hotelling. *Id.* In particular, a POSITA would have known

that touchscreens typically include a glass layer. For example, Fitzgerald also discloses a touchscreen made of glass. Ex-1014, 3:63-66. A glass surface presents a smooth two-dimensional interface to a user that is convenient for finger gestures and also protects the surface from scratches that might plague softer surfaces such as acrylic or other plastics. Thus, a POSITA would have been motivated to incorporate Hotelling's glass touchscreen panel into the combined Duarte-Biggs LCD touchscreen watch and would have expected such a combination to be successful.

246. Moreover, a POSITA would have understood that the face of a wristwatch is susceptible to bumps and scratches and thus that a touchscreen on the watch face needs protection. And a POSITA would have been motivated to make this combination by Duarte's invitation that its touch-sensitive screen 101 "can be implemented using any technology that is capable of detecting a location of contact and/or user motion proximate to the surface." Ex-1010, 5:16-18. Thus, a POSITA would have been motivated to combine Duarte, Biggs, and Hotelling as set forth above and would have expected that combination to be successful.

2. Independent Claim 1

a. Element 1[preamble]: A wristwatch having

247. Duarte-Biggs-Hotelling teaches the preamble, to the extent it is limiting.

248. As shown in Figure 2b, Biggs discloses a “device 101, for example a watch, [that] contains an operating system for monitoring all I/O functions as well as a display driver and device interfaces controlled by a processor 123.” Ex-1012, 9:11-14.

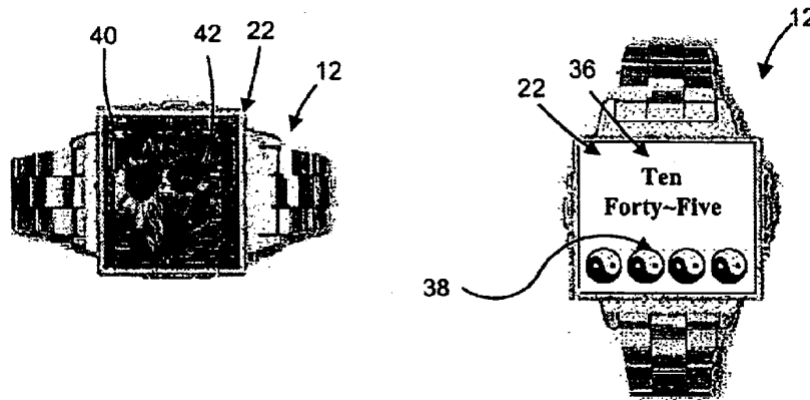
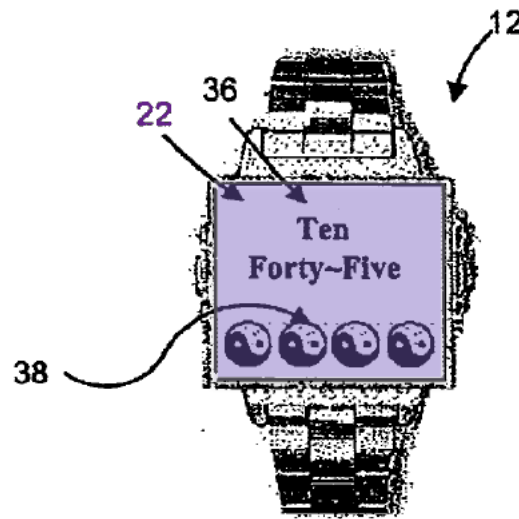


Figure 2b

b. Element 1[a]: a digital matrix display

249. Duarte-Biggs-Hotelling teaches Element 1[a].

250. In the wristwatch of Biggs’ Figure 2b, display 22 is “preferably a high resolution LCD display” capable of showing customized display (including animation) indicating the time. Ex-1012, 3:52-56.



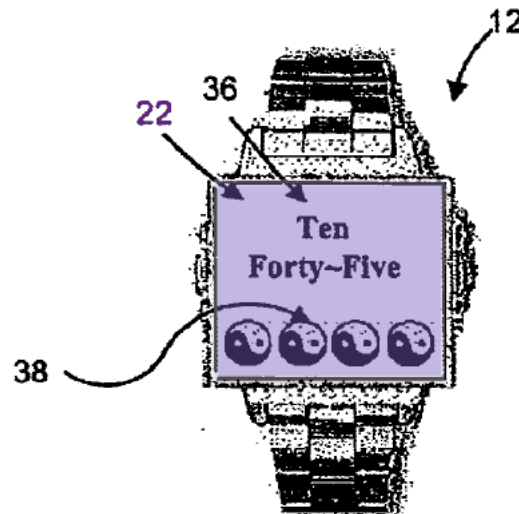
251. A high resolution LCD with animation is a digital matrix display. As I discussed above in ¶88 with respect to Louch, a POSITA would have understood that a “high resolution LCD display” would be a digital matrix display because a segmented display, by contrast, would include only a few pre-defined segments and would not be capable of displaying the types of graphics illustrated in Biggs. *E.g.*, Ex-1012, Figs. 2b, 2c, 3. Moreover, Duarte’s display screen is depicted as displaying multiple graphical icons and applications with graphical user interfaces that can be resized, moved, scrolled, and otherwise manipulated on the display. Ex-1010, Figs. 1-9. And, Hotelling describes its LCD as a “matrix” display. Ex-1006 ¶51. Thus, a POSITA would have understood that the watch of the combined Duarte-Biggs-Hotelling device would have been a digital matrix display.

252. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches the digital matrix display of Element 1[a].

c. Element 1[b]: a sheet of touch-sensitive glass

253. Duarte-Biggs-Hotelling teaches Element 1[b].

254. As discussed above, in Section VIII.E.1, the combined Duarte-Biggs-Hotelling system is a watch with a touch-sensitive glass LCD. For example, display 22 in Figure 2b of Biggs is touch-sensitive. Biggs states: “If the display 22 is *touch sensitive*, then the display 22 itself can be the user input device 24.” Ex-1012, 3:64-65.



255. Hotelling also discloses a LCD display with a touchscreen. Ex-1006 ¶37. Hotelling further discloses that the touchscreen includes a glass member or protective coversheet made of glass to protect the LCD display from forces exerted on the touchscreen. *Id.* ¶¶71-72. As I discussed above in Section VIII.E.1, a POSITA would have been motivated to form the combination of Duarte-Biggs-

Hotelling using a touchscreen with glass to protect the LCD display as taught in Hotelling.

256. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches the sheet of touch-sensitive glass of Element 1[b].

- d. **Element 1[c]: a processing circuit specifically laid out so as to interpret the signals from the touch-sensitive glass, for selecting a card from several available cards depending on these signals and for displaying said card on the entire digital matrix display**

257. Duarte-Biggs-Hotelling teaches Element 1[c].

258. Biggs teaches “*processor 23* is also coupled to the display 22 by a graphic controller and to user input devices 24[.] If the display 22 is touch sensitive, then the display 22 itself can be the user input device 24.” Ex-1012, 3:56-65.

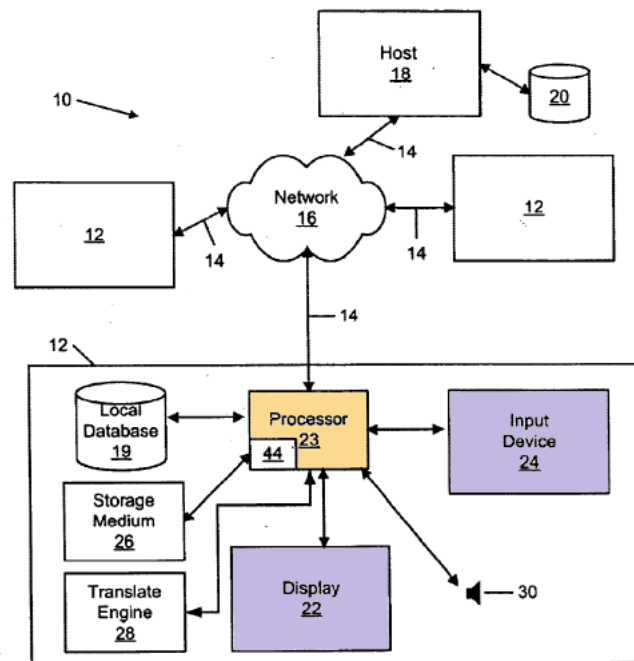


Figure 1

259. Duarte teaches “a processing circuit specifically laid out so as to interpret the signals from the touch-sensitive glass,” as recited in Element 1[c].

260. For example, Duarte’s touchscreen involves “a computer system, or similar electronic computing module and/or device” (Ex-1010, 10:27-36) that may include a single or multiple processors (*id.*, 10:57-59). Duarte also “interpret[s] the signals from the touch-sensitive [display] glass, for selecting a card from several available cards depending on these signals and for displaying said card,” as recited in Element 1[c].

261. The cards correspond to windows 301 in Duarte, which represent activities or applications. A user may drag windows left or right on the touch screen to select one window 301 from several available application windows 301, as shown in Figure 3. Ex-1010, 6:54-59, 6:64-7:17.

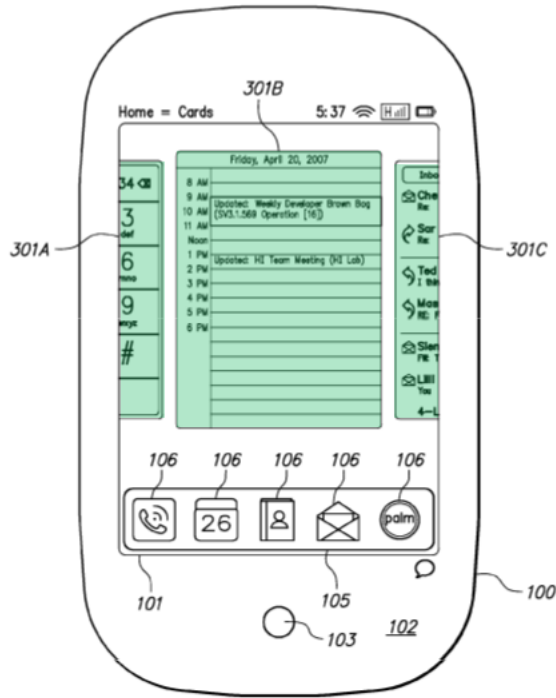


FIG. 3

262. Figure 7 is a conceptual depiction of switching from one window 301 to another. *Id.*, 7:44-8:4

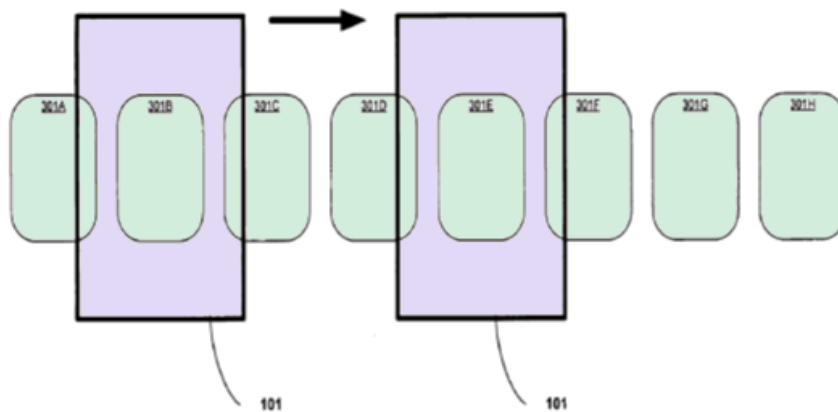


FIG. 7

263. The selected card/widget can be displayed on the “entire digital matrix display,” as shown in Figure 2.

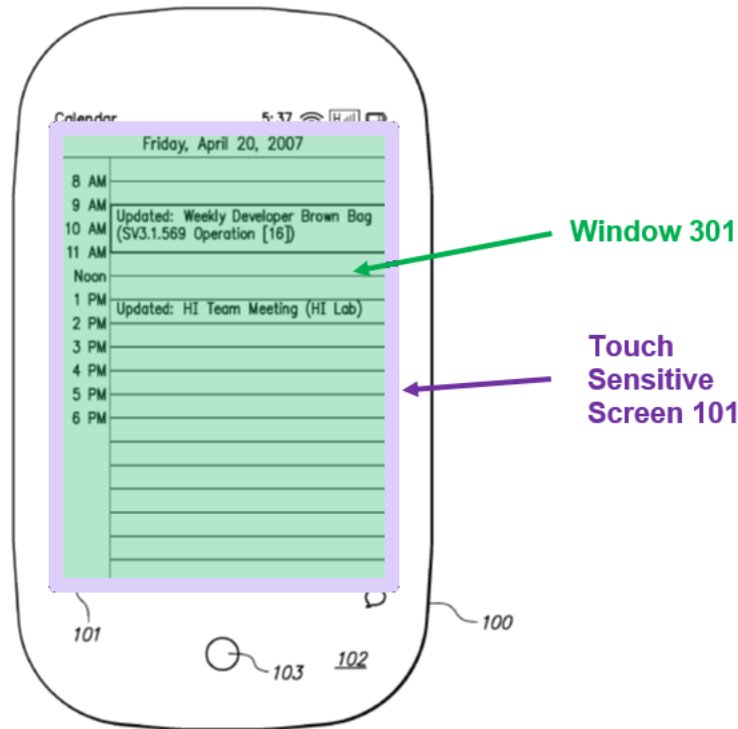


FIG. 2

264. Moreover, “a gesture can be performed *even in full-screen mode*, causing windows 301 to move left and right in the same manner as described above for windowed mode.” Ex-1010, 6:60-63.

265. A POSITA would have understood that Duarte’s user interface, with a processing circuit specifically laid out so as to interpret the signals from the touch-sensitive glass, for selecting a card from several available cards depending on these signals and for displaying said card on the entire digital matrix display, would have been compatible with Bigg’s watch form factor. The fact that Biggs by itself has a

touch-sensitive high-resolution LCD screen controlled by a processor that can display high-resolution images including clock faces and other applications to a user would have led a POSITA to believe that implementing Duarte's interface on Biggs's watch would have been successful.

266. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches a processing circuit that interprets the signals from the touch-sensitive glass and allows a user to select a card from several available to display on the entire digital matrix display.

- e. Element 1[d]: wherein said touch-sensitive glass is a two-dimensional glass for detecting a movement of at least one finger at any place on the touch-sensitive glass along at least two different directions**

267. Duarte-Biggs-Hotelling teaches Element 1[d].

268. In the context of this claim, "two-dimensional glass" refers to the surface of the touch-sensitive glass that the user interacts with. Ex-1001, 2:7-23.

269. As described above with reference to Element 1[b] (Section VIII.E.2.c), Duarte teaches a touch-sensitive glass for interacting with windows 301. That touch-sensitive glass includes a two-dimensional surface, as explained for the combination of Duarte-Biggs-Hotelling in Section VIII.E.1.

270. Duarte teaches "detecting a movement of at least one finger at any place on the touch-sensitive glass along at least two different directions." For example, "when the *user drags a window 301 to the left or right* within display screen 100,

other windows 301 move in concert with the dragged window 301.” Ex-1010, 6:64-67. And “**two or more axes of movements** can be made available” for window motion. Ex-1010, 3:44-48, 7:36-43. A POSITA would have understood that a touchscreen that can make available “two or more axes of movements” such that finger motions in horizontal, vertical, and diagonal directions can be detected, would be a two-dimensional touch-sensitive surface.

271. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches a two-dimensional glass for detecting a movement of at least one finger at any place on the touch-sensitive glass along at least two different directions.

- f. Element 1[e]: wherein said processing circuit is specifically laid out so as to cause said several available cards to scroll past in order to lastingly replace the initially displayed card with a replacement card selected between said several available cards, wherein each card of said several available cards has a distinct fixed or periodically refreshed image**

272. Duarte-Biggs-Hotelling teaches Element 1[e].

273. As described above for Element 1[c] (Section VIII.E.2.d), Duarte-Biggs-Hotelling teaches a processor configured to “cause said several available cards to scroll past.”

274. Duarte also teaches “lastingly replac[ing] the initially displayed card with a replacement card selected between said several available cards,” as recited in Element 1[e]. For example, Figure 7 “depicts movement of the display screen 101

from an initial position where window 301B has focus (and windows 301A and 301C are partially visible) to a second position where window 301E is has focus (and windows 301D and 301F are partially visible).” Ex-1010, 7:51-56.

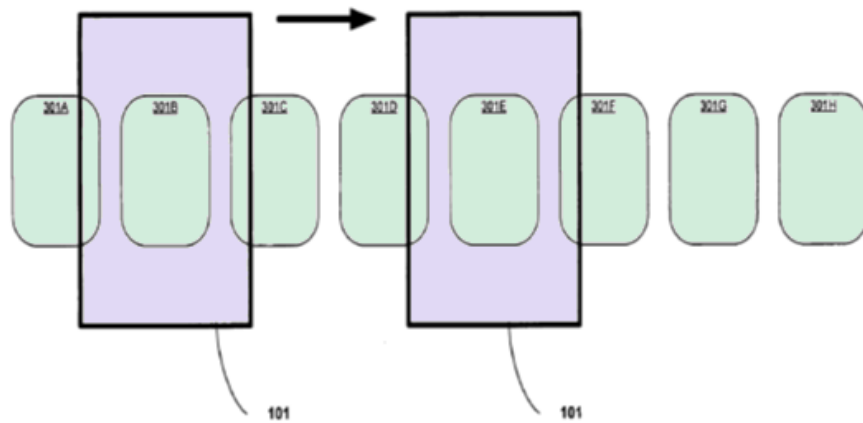


FIG. 7

275. When a user stops scrolling, new window 301E lastingly replaces the initial window 301B. A POSITA would have understood that starting from one window, scrolling to select a new window would cause that new window to be displayed as the active window on the screen. Thus, its image would “lastingly replace” that of the original window. For example, Duarte discloses “if the user drags windows 301 so as to place a window 301 sufficiently close to the central position to make it clear that the intention is to give the window 301 focus, the window 301 snaps into the central position upon completion of the drag operation.”

Ex-1010, 7:6-10. A POSITA would have understood that the new window that snaps into place and now has focus would lastingly replace the first.

276. Duarte also teaches that each window has “a distinct fixed or periodically refreshed image.” Duarte’s windows “show applications or other activities in operation.” Ex-1010, 7:18-21. To reflect the operation of the activities, windows 301 would be “periodically refreshed.” For example, Duarte discloses that a window might be a “calendar application.” *Id.*, 6:3-6. A POSITA would have understood that a calendar would be periodically refreshed to show the current day or to show new activities the user may add. Thus, a POSITA would have recognized that such a window would display a periodically refreshed image. Duarte also discloses a window that is a phone dial pad. *Id.*, Fig. 6F. Such an image is generally a fixed image depicting the numbers keys available for dialing.

277. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches a processing circuit that enables available cards to scroll past in order to lastingly replace the initially displayed card with a replacement card, wherein each card of said several available cards has a distinct fixed or periodically refreshed image.

- g. Element 1[f]: wherein the size of the image corresponds to the size of said digital matrix display so that the displayed card occupies the whole of said digital matrix display**

278. Duarte-Biggs-Hotelling teaches Element 1[f].

279. Duarte teaches that “in a full-screen mode, one activity occupies substantially an entire display screen.” Ex-1010, 2:62-63; *see also id.*, 6:3-19. Duarte also clarifies that “windows 301 show applications or other activities in operation.” *Id.*, 7:18-19. So a POSITA would have understood that an “activity” occupying the entire display screen means one of the windows (or cards) occupies the entire screen. Duarte also teaches that windows 301 can be scrolled “in full-screen mode.” *Id.*, 6:59-63.

280. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches that the size of the image corresponds to the size of said digital matrix display so that the displayed card occupies the whole of said digital matrix display.

- h. Element 1[g]: wherein one card of said several available cards and occupying the entire digital matrix display is immediately and without further user intervention replaced after the scrolling by a different card of said several available cards that occupies the entire digital matrix display**

281. Duarte-Biggs-Hotelling teaches Element 1[g].

282. As described above for Element 1[c] (Section VIII.E.2.d), Duarte teaches dragging windows in full-screen mode. Ex-1010, 6:60-63. Furthermore, Duarte describes that once a user drags a window “sufficiently close to the central position to make it clear that the intention is to give the window 301 focus, the window 301 snaps into the central position upon completion of the drag operation.”

Ex-1010, 7:6-10. With full-screen scrolling, this snap-into-central-position feature means that one window 301 replaces another on the entire display without further user intervention, as required by Element 1[g].

283. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches that a card occupying the whole display can be immediately and without further user intervention be replaced after the scrolling by a different card that occupies the entire digital matrix display.

- i. **Element 1[h]: wherein said processing circuit is further laid out so that the replacement card is dependent from the initially displayed card and from the direction of said movement and is independent from the starting point and end point of said movement on said digital matrix display**

284. Duarte-Biggs-Hotelling teaches Element 1[h].

285. Duarte teaches that “the replacement card is dependent from the initially displayed card and from the direction of said movement.” Duarte states that when windows 301 are dragged left or right, “a positional sequence is maintained” among windows 301. Ex-1010, 7:49-51. Duarte further discloses that “other windows move in concert with the dragged window” and “if the user drags window 301B to the right, windows 301A and 301C move to the right as well.” *Id.*, 6:67-7:5. Because the ordering is maintained, a POSITA would have understood that the replacement card is dependent from the initially displayed card because it will

require scrolling through a predetermined number of cards in a specific direction to get from one specific starting card to a specific replacement card. Thus, the replacement window depends on both the initially displayed window and the direction of the movement, as illustrated in Figure 7.

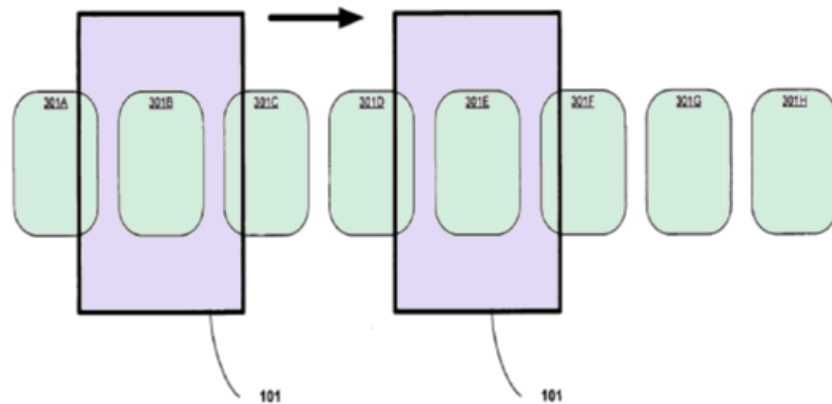


FIG. 7

286. Duarte also teaches that the replacement window is “independent from the starting point and end point of said movement on said digital matrix display.” First, Duarte describes dragging windows left and right—a description that focuses on the direction of the movement rather than touching any particular part of the screen. *See, e.g.*, Ex-1010, 3:31-36. Second, Duarte also describes a snap-into-central-position feature, making clear that the window does not have to be dragged to a particular position. Ex-1010, 7:6-10 (“the user need not drag the window 301 all the way to the central position.”). Thus, the replacement card is independent of the starting or ending point of the movement on the touchscreen. Duarte also

discloses that a user can “repeatedly drag windows 301 in a leftward direction to cause windows 301C, 301D, and 301E to successively occupy the central position.” *Id.*, 7:60-63. A POSITA would have understood that this means a gesture with a particular starting and end point is not required to replace card 301C with card 301E, as it could be done with two successive leftward gestures. Moreover, “swipe” gestures such as Duarte’s scrolling motions were well-known in the art for entering commands that do not depend on a particular start or end point. *See, e.g.*, Ex-1033 ¶46 (“Interspersing the tedious task of typing using the small keys with *swipes that do not require a specific point of origin* can give users a nice break from the sensorimotor and cognitive load of targeting very tiny keys.”) And Duarte never imposes any requirements on starting and ending points for gestures, instead mentioning only the direction of a gesture.

287. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches that the replacement card is dependent from the initially displayed card and from the direction of said movement and is independent from the starting point and end point of said movement on said digital matrix display.

3. Dependent Claim 2: The wristwatch of claim 1, wherein each card shows a particular function of the wristwatch.

288. Duarte-Biggs-Hotelling in combination teaches Claim 2.

289. Duarte teaches that each window “shows a particular function,” as recited in Claim 2. In Figure 2, window 301 shows “a calendar application.” Ex-1010, 6:3-7.

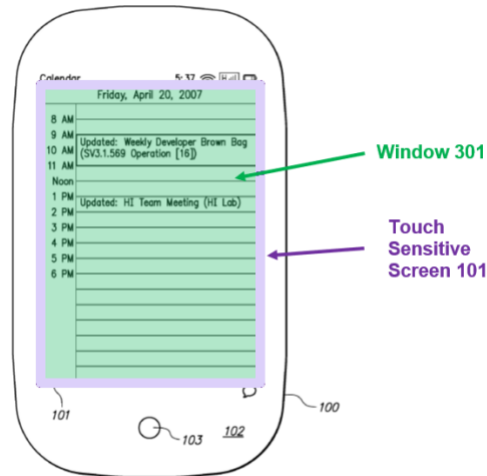
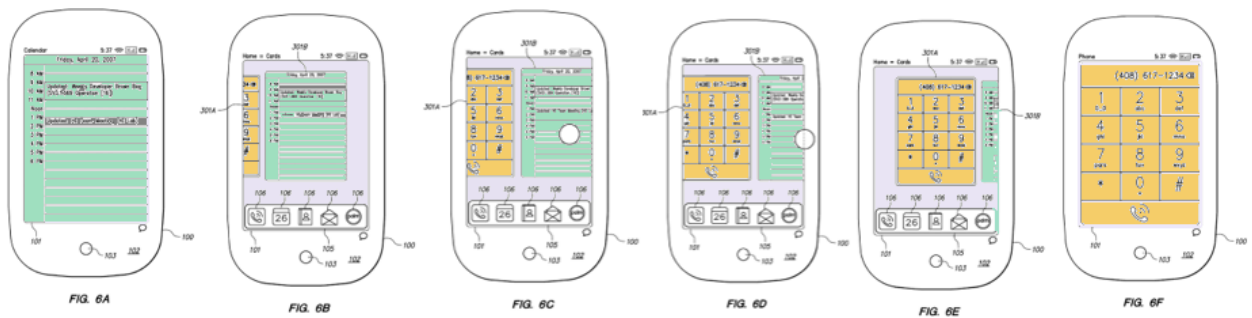


FIG. 2

290. Figures 6A-6F show switching from window 301B with a calendar application to window 301A with a telephone application.



291. More generally, Duarte discloses that “windows 301 show applications or other activities in operation. Thus, as the user navigates among windows 301, he or she can see the actual live application or other activity within each window.” *Id.*,

7:18-21. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches that each card shows a particular function of the wristwatch.

4. Dependent Claim 3: The wristwatch of claim 2, wherein each card defines the behavior of the touch-sensitive glass interface and the functions or modules that are to be launched depending on the movements of the finger on the card.

292. Duarte-Biggs-Hotelling teaches Claim 3

293. In Duarte, each window 301 defines “on-screen elements” with which the user interacts. Ex-1010, 6:15-19. For example, the telephone application in Figure 6F includes a dial pad where a user can enter telephone numbers and place a call.



FIG. 6F

294. Moreover, Duarte discloses that “windows 301 show applications or other activities in operation. Thus, as the user navigates among windows 301, he or she can see the actual live application or other activity within each window.” *Id.*,

7:18-21. Thus, each window defines a behavior of the touch sensitive glass interface based on how the user would interact with the application or activity depicted. In some cases, the behavior of the touch-sensitive glass for a given window might be only to enable swiping to the right or left to dismiss that window and bring up a new one. For others, certain graphical elements within the window might cause areas of the screen to be redefined for application-specific functions, such as the keypad areas of the telephone application disclosed in Figure 6F of Duarte.

295. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches that each card defines the behavior of the touch-sensitive glass interface and the functions or modules that are to be launched depending on the movements of the finger on the card.

5. Dependent Claim 4: The wristwatch of claim 2, wherein said cards are arranged in a plurality of levels, wherein the choice of a card within each level is made either by scrolling vertically or by scrolling horizontally, wherein a particular command makes it possible to switch from one level to another.

296. Duarte-Biggs-Hotelling teaches Claim 4.

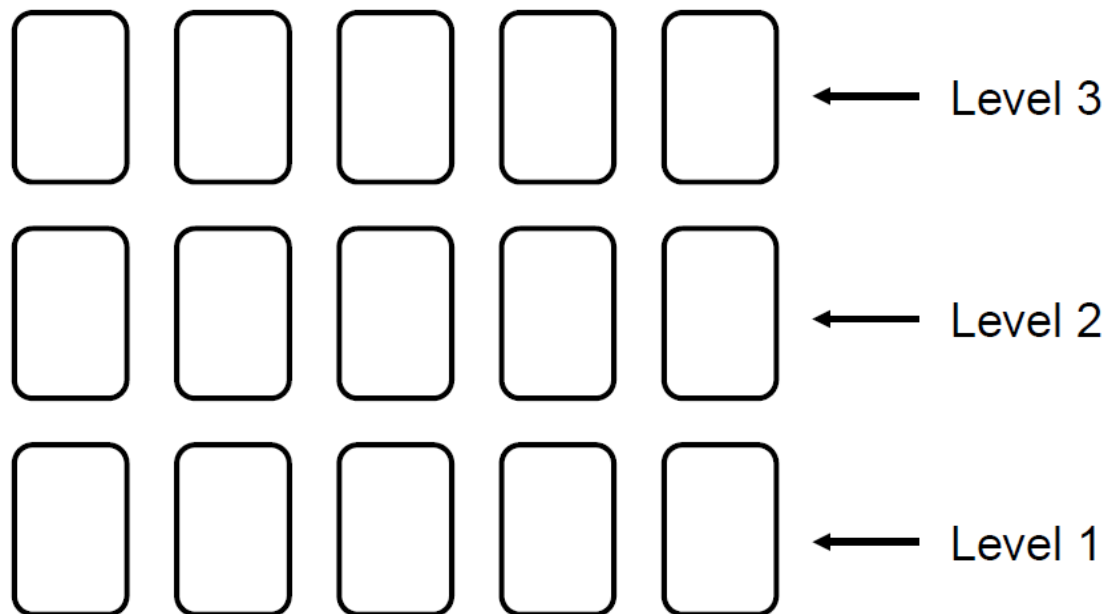
297. As discussed above in Element 1[d] (Section VIII.E.2.e), while Duarte depicts windows arranged in a horizontal row, it explains at 7:36-43 that they can also be arranged vertically or in two dimensions:

In the examples described herein, windows 301 are arranged in a horizontal row. The user moves windows 301 along a horizontal axis

to navigate from one activity to another. One skilled in the art will recognize that other arrangements are possible. For example, windows 301 could be arranged vertically instead of horizontally. Alternatively, a two-dimensional arrangement of windows 301 can be provided.

298. Duarte further explains that “The positional relationship can be a one-dimensional sequence or some more complex two-dimensional relationship.” Ex-1010, 3:62-65.

299. To visualize how Duarte’s two-dimensional teaching would have been understood by a POSITA, I prepared the figure below, based on Duarte’s depiction of windows arranged in rows:



300. Here, windows are arranged in a two-dimensional matrix with a stack of windows at each position along the row, showing what Duarte would refer to as

a “two-dimensional relationship.” Duarte further discloses that while certain embodiments might constrain window motion to a single axis horizontal or vertical), “[a]lternatively, two or more axes of movements can be made available.” *Id.*, 3:44-48. A POSITA would have understood Duarte’s disclosure of a “two-dimensional arrangement,” coupled with its disclosure that two axes of movements (e.g., horizontal and vertical) can be made available, to mean that cards can be arranged in a plurality of levels. I have indicated these levels in the figure above as multiple rows.

301. As discussed above in Element 1[c] (Section VIII.E.2.d), Duarte describes scrolling horizontally and vertically. Scrolling horizontally through windows 301 in a row discloses “the choice of a card within each level is made . . . by scrolling horizontally,” as recited in Claim 4. Moreover, scrolling vertically to select one of the rows in Duarte discloses “a particular command mak[ing] it possible to switch from one level to another,” as recited in Claim 4.

302. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches that cards are arranged in a plurality of levels, wherein the choice of a card within each level is made either by scrolling vertically or by scrolling horizontally, wherein a particular command makes it possible to switch from one level to another.

- 6. Dependent Claim 5: The wristwatch of claim 4, wherein at least one of said cards makes it possible to calculate and display a simulation of a mechanical watch displaying the time, so as to enable the user to change the mechanical watch displayed by scrolling cards.**

303. Duarte-Biggs-Hotelling teaches Claim 5.

304. Biggs teaches that users can “create customized thematic time displays[,] which translate chronological time data 44 . . . into language and animation.” *Id.*, 3:52-56. The user can select aspects of the display, such as the background of the display or the particular minute indicator. *Id.*, 7:10-18, 7:31-34. The user’s selections result in a executable file 60. *Id.*, 5:17-22. By changing executable files 60, the user can change the display of time. *Id.*, 5:40-44, 8:59-65. Thus, a user can create different executable files 60 for different displays of time.

305. It would have been obvious that the different displays of time could encompass a “simulation of a mechanical watch.” Biggs recognizes that it was known to display rotating hour and minutes hands to indicate time. Ex-1012, 1:17-30. It would have been obvious to a POSITA to include such a mechanical watch as an available image or animation a user could customize and display on the watch as taught by Biggs.

306. Moreover, given Duarte’s teaching of scrolling to switch cards as explained in Elements 1[c]-[d] (§VIII.E.2.d-e), Duarte-Biggs-Hotelling also teaches enabling “the user to change the mechanical watch displayed by scrolling cards,” as

recited in Claim 5. Duarte teaches that each window 310 shows an application. Ex-1010, 5:64-65. It would have been obvious to a POSITA that certain ones of windows 310 could correspond to executable files 60 presenting a mechanical watch display (as taught in Biggs), and thus, the scrolling of windows 310 (as taught in Duarte) “enable[s] the user to change the mechanical watch displayed.”

307. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches that at least one of said cards makes it possible to calculate and display a simulation of a mechanical watch displaying the time, so as to enable the user to change the mechanical watch displayed by scrolling cards.

7. Dependent Claim 6: The wristwatch of claim 1, wherein the processing circuit being laid out for detecting simultaneous contacts on several points of the touch-sensitive glass so as to constitute a multi-touch haptic screen.

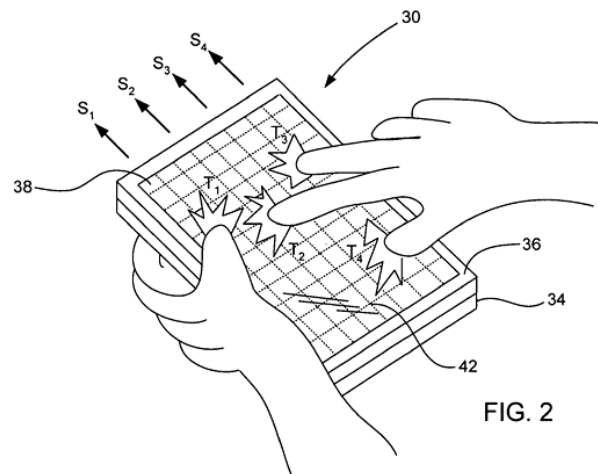
308. Duarte-Biggs-Hotelling teaches Claim 6.

309. First, as discussed above, the ‘922 Patent use the term “haptic screen or surface” to mean touchscreen, consistent with dictionary definitions and the understanding of a POSITA. Ex-1015.

310. Duarte discloses a multi-touch display: “the user can drag a corner of a window 301 to resize it, or can use *two fingers* to pinch the edges or corners of a window 301 to resize it.” Ex-1010, 9:27-30. A POSITA would have understood that a gesture made by two fingers, such as a pinch, would require the touchscreen

to track two touch points simultaneously and would therefore require a multi-touch haptic screen.

311. Hotelling also discloses a multi-touch display. As shown by Figure 2, touch screen 36 in Hotelling “is configured to recognize multiple touch events that occur at different locations on the touch sensitive surface 38 of the touch screen 36 at the same time.” Ex-1006 ¶38.



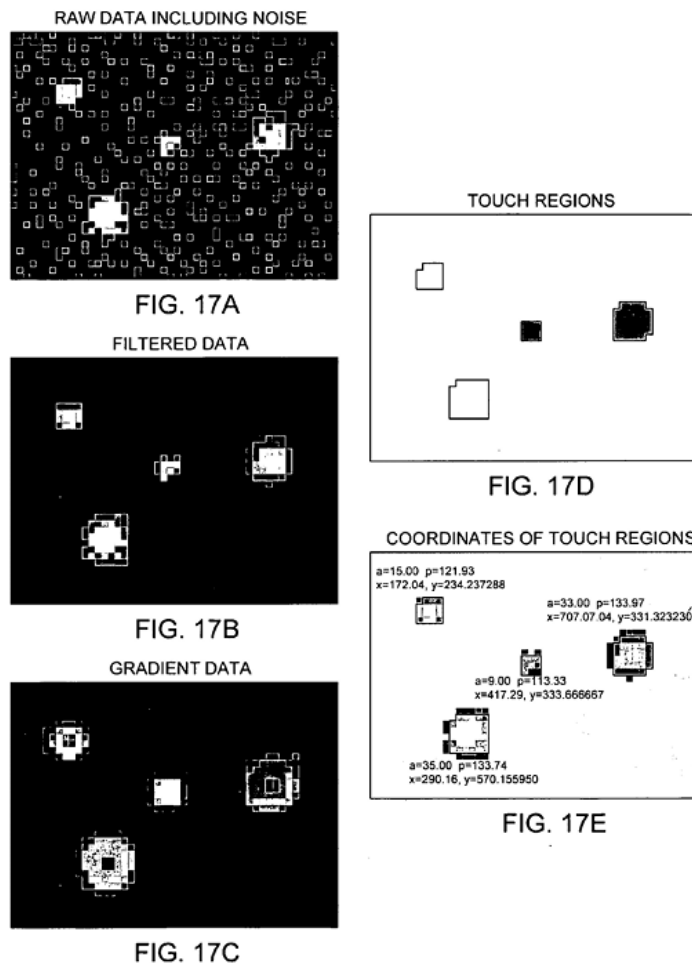
312. A POSITA would have understood that a multi-touch display (as taught in Duarte and Hotelling) would require a “processing circuit being laid out for detecting simultaneous contacts on several points of the touch-sensitive glass so as to constitute a multi-touch haptic screen.”

313. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches a processing circuit being laid out for detecting simultaneous contacts on several points of the touch-sensitive glass so as to constitute a multi-touch haptic screen.

8. **Dependent Claim 7: The wristwatch of claim 1, wherein the processing circuit being laid out for determining the displacement of the center of gravity of the contact zone of the finger on the touch-sensitive glass.**

314. Duarte-Biggs-Hotelling teaches Claim 7.

315. Hotelling teaches, “determining . . . the displacement of the center of gravity of the contact zone of the finger on the . . . touch-sensitive glass,” as recited in Claims 7 and 12. Hotelling describes “determining the center point for each touch region (e.g., centroid).” Ex-1006 ¶56; *see also id.* ¶¶101-04 (explaining the calculation of a centroid). This process is shown in Hotelling’s Figures 17A-E:



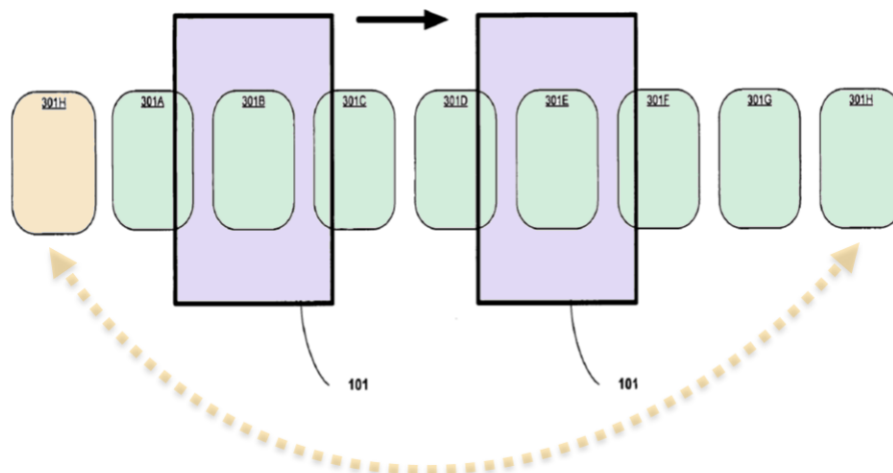
316. As I explained in detail in Section VIII.3.e with respect to the Louch ground, a POSITA would have understood that this center point or centroid corresponds to the center of gravity.

317. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches a processing circuit being laid out for determining the displacement of the center of gravity of the contact zone of the finger on the touch-sensitive glass.

9. Dependent Claim 8: The wristwatch of claim 1, wherein said several available cards are organized in a virtual closed loop row or in a virtual closed loop column.

318. Duarte-Biggs-Hotelling teaches Claim 8.

319. Duarte discloses “a closed loop row.” Referring to Figure 7 (annotated below), Duarte discloses at least a virtual closed loop row: “In one embodiment, *the sequence is circular*, so that the rightmost window 301 [301H] is considered to be to the left of the leftmost window 301 [301A]. Thus, moving off one end of the sequence takes the user back to the other end of the sequence.” Ex-1010, 8:17-22.



320. Though a closed loop row is sufficient to disclose this limitation, Duarte also discloses that “windows 301 could be arranged vertically instead of horizontally.” *Id.*, 7:40-41. So a POSITA would have understood that Duarte also discloses a virtual closed loop column.

321. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches that cards can be organized in a virtual closed loop row or in a virtual closed loop column.

10. Independent Claim 9

- a. Element 9[pre]: A method for replacing an initially displayed card displayed by a wristwatch by a replacement card, the method having the following steps:**

322. Biggs discloses “a wristwatch” for the same reasons described above for Element 1[preamble] (§VIII.E.2.a), and Duarte-Biggs teaches “replacing an initially displayed card displayed by a wristwatch by a replacement card” for the same reasons described above for Elements 1[c] (§VIII.E.2.d) and 1[e] (§VIII.E.2.f). *See also* Ex-1020, Element 9[pre].

- b. Element 9[a]: detecting a direction of a movement of at least one finger at any place and along at least two different directions on a two-dimensional touch-sensitive glass;**

323. The limitations of Element 9[a] are included in Elements 1[b] and [d] of Claim 1. Ex-1020, Element 9[a].

324. Thus, Duarte-Biggs-Hotelling teaches Element 9[a] for the same reasons described above for Elements 1[b] (§VIII.E.2.c) and 1[d] (§VIII.E.2.e).

- c. **Element 9[b]: [1] scrolling on a digital matrix display of several available cards so as for said scrolling to stop of itself so as to align an edge of the replacement card with an edge of the matrix display, [2] wherein one card of said several available cards and occupying the entire digital matrix display is replaced after the scrolling, immediately and without further user intervention, by a different card selected between said several available cards and occupying the entire digital matrix display; [3] and wherein the scrolling direction depends only on the direction of said movement so that said replacement card is dependent from the initially displayed card and from the direction of said movement and is independent from the starting point and end point of said movement on said digital matrix display;**

325. Most of the limitations of Element 9[b] are included in Elements 1[e]-1[h] of Claim 1. Portions of element 9[b][1] corresponds to Element 1[e]; Element 9[b][2] corresponds to Elements 1[f] and 1[g]; Element 9[b][3] corresponds to Element 1[h]. Ex-1020, element 9[b].

326. The remaining portion of element 9[b][1] is “scrolling to stop of itself so as to align an edge of the replacement card with an edge of the matrix display,” which is also disclosed by Duarte. Specifically, window 301 may snap into a central position upon completion of the drag. Ex-1010, 7:6-17. Windows 301 may be scrolled left and right in full screen mode. *Id.*, 6:59-63.

327. A POSITA would have understood that the combination of these two features results in the claimed “scrolling to stop of itself so as to align an edge of the replacement card with an edge of the matrix display.” A POSITA would have been motivated to include this functionality because users tend to prefer automatic adjustments, such as automatic zooming, while scrolling. See Ex-1032, p. 1.

328. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches scrolling to stop of itself so as to align an edge of the replacement card with an edge of the matrix display.

- d. Element 9[c]: [1] lastingly displaying the replacement card on the whole of said digital matrix display, wherein each card of said several available cards has a distinct fixed or periodically refreshed image, [2] the size of the images corresponding to the size of said digital matrix display.**

329. Element 9[c][1] corresponds to Element 1[e] and Element 9[c][2] corresponds to Element 1[f]. Ex-1020, element 9[c]. Accordingly, Duarte-Biggs-Hotelling teaches Element 9[c] for the reasons explained above for Elements 1[e]-1[f] (§VIII.E.2.f-g).

11. Dependent Claim 10: The method of claim 9, further including the entering of a touch command for confirming or stopping the scrolling

330. Duarte-Biggs-Hotelling teaches Claim 10.

331. Duarte discloses that in one embodiment, a user may drag a window part of the way toward the center of the screen and then when the user lifts the finger

(a gesture that signals the end of the drag gesture) the window will snap to the central position. Ex-1010, 7:6-17. A POSITA would have understood this finger lift as a gesture that confirms or stops the scrolling.

332. In other embodiments without the snap feature, Duarte discloses that while scrolling, a user can touch a partially displayed window to cause it to gain focus and move to the center. *Id.*, 3:31-36, 7:60-8:4. A POSITA would have recognized this touch as another example of a gesture that confirms or stops the scrolling.

333. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches further including the entering of a touch command for confirming or stopping the scrolling.

12. Dependent Claim 11: The method of claim 9, further comprising the detecting of simultaneous contacts on several points of the two-dimensional touch-sensitive glass.

334. Duarte-Biggs-Hotelling teaches Claim 11 for the same reasons described above for Claim 6 (§VIII.E.7). Ex-1020, Cl. 11.

13. Dependent Claim 12: The method of claim 9, further comprising the determining of the displacement of the center of gravity of the contact zone of the finger on the two-dimensional touch-sensitive glass.

335. Duarte-Biggs-Hotelling teaches Claim 12 for the same reasons described above for Claim 7 (§VIII.E.8). Ex-1020, Cl. 7.

- 14. Dependent Claim 13: The method of claim 9, wherein the different cards scroll in continuous fashion on the digital matrix display, the scrolling being interrupted so as to align the edge of a card with the edge of the digital matrix display.**

336. Duarte-Biggs-Hotelling teaches Claim 13 for the same reasons described above for Element 1[e] (§VIII.E.2.f) and Element 9[b][1] (§VIII.E.10.c).
Ex-1020, Cl. 13.

- 15. Dependent Claim 17: The method of claim 13, wherein the card scrolling is interrupted by a brief pressure on the two-dimensional touch-sensitive, so as to cause the card best centered on the display at the time of the interruption to be selected and displayed.**

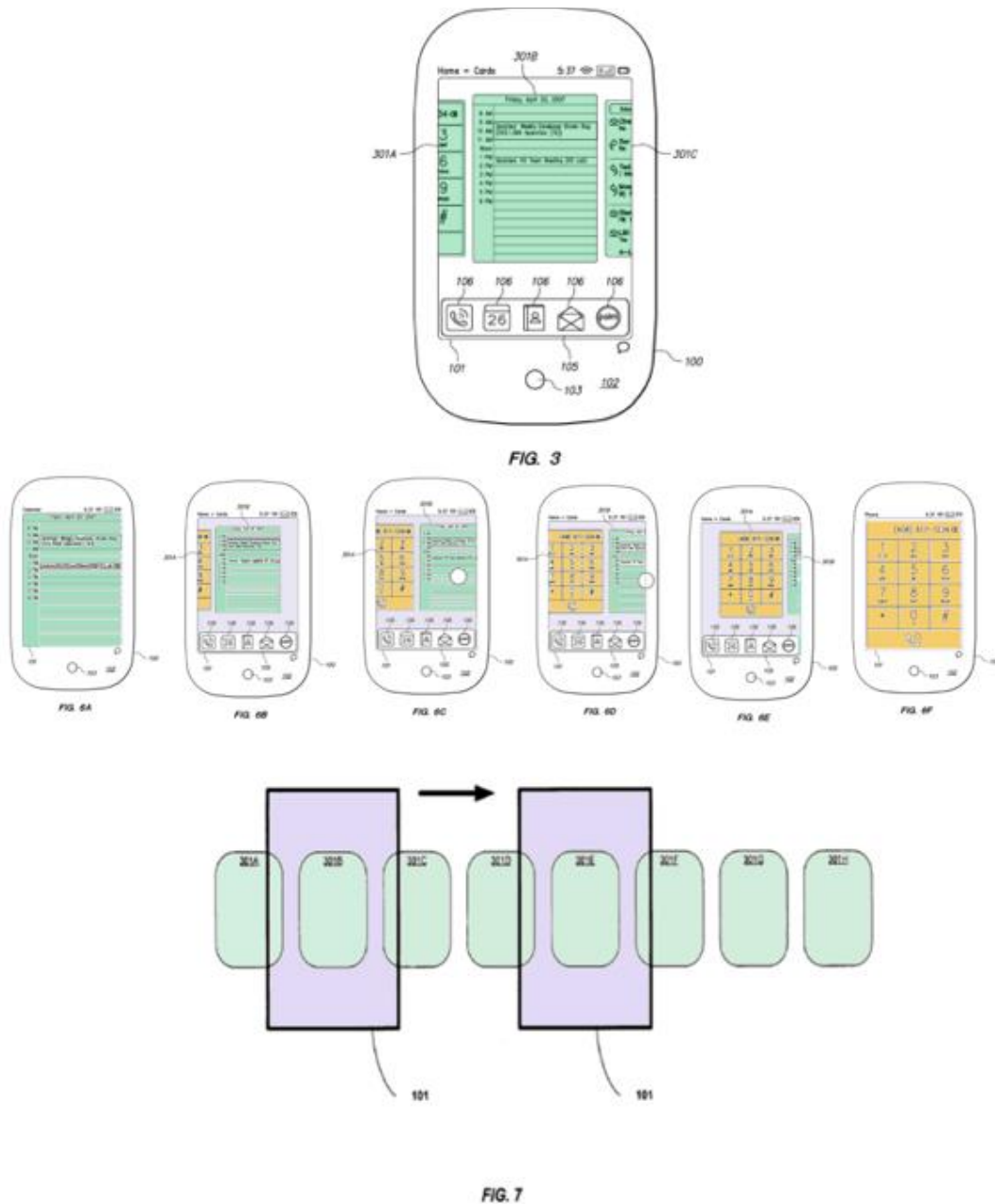
337. Duarte-Biggs-Hotelling teaches Claim 17.

338. As described above for Claim 10 (§VIII.E.11), Duarte describes scrolling the windows 301 by dragging them with a finger. Ex-1010, 6:64-7:5. In embodiments without the snap feature, if the user were to stop dragging before a card was centered on the display, Duarte discloses that a user can touch a partially displayed window to cause it to gain focus and move to the center. *Id.*, 3:31-36, 7:60-8:4. A POSITA would have recognized a touch as a “brief pressure on the two-dimensional touch-sensitive” screen that would cause the partially centered card at the time scrolling was interrupted to gain focus, i.e., be selected and displayed.

16. Dependent Claim 18: The method of claim 9, wherein the size of the displayed cards is reduced during scrolling, so as to display several cards simultaneously.

339. Duarte-Biggs-Hotelling teaches Claim 18.

340. Duarte describes windowed mode, in which “the size of the displayed cards is reduced during scrolling, so as to display several cards simultaneously,” as recited in Claim 18. Ex-1010, 8:5-9. Figures 3, 6B-E, and 7 show several cards displayed simultaneously.



341. To the extent windowed mode is entered and exited by a user command as opposed to automatically, it would have been obvious to a POSITA to modify Duarte's algorithm to automatically enter window mode while scrolling and automatically exit window mode once the scrolling stopped. This would have the

advantage of allowing the user to see more than one or two cards at a time during scrolling operations, which would facilitate selecting the desired card to replace the initially displayed one. Such a modification would have been simple to implement because Duarte already discloses scrolling in either a full-screen mode or in a windowed mode and discloses that switching from windowed mode to full screen mode can take place automatically. For example, at column 3, lines 49-56, Duarte discloses:

In one embodiment, once the user has moved the desired window to the central position so that it has focus, he or she can indicate that the display should return to full-screen mode, so that the activity having focus occupies substantially the entire screen. Alternatively, ***the device can return to full-screen mode automatically*** after a period of time elapses where no window movement takes place, or if the user starts to interact with the activity that has focus.

342. Duarte also generally teaches changing the size of windows 301 during scrolling: “In one embodiment, the window 301 that is centrally displayed at any given time is shown slightly larger than other windows 301.” Ex-1010, 8:7-9. Based on this teaching, it would have been obvious to a POSITA that the size of windows 301 could be reduced during scrolling in full-screen mode, so as to display several cards simultaneously.

343. Thus, it is my opinion that Duarte-Biggs-Hotelling teaches the size of the displayed cards is reduced during scrolling, so as to display several cards simultaneously.

- 17. Dependent Claim 19: The method of claim 9, wherein said cards are arranged in a plurality of levels, wherein the method comprises a step of vertical or horizontal scrolling and a step of entering a particular command for switching from one level to another.**

344. Duarte-Biggs-Hotelling teaches Claim 19 for the same reasons described above for Claim 4 (§VIII.E.5). Ex-1020, Cl. 19.

- 18. Dependent Claim 20: The method of claim 9, wherein a plurality of said cards displays a simulation of a virtual mechanical movement.**

345. Duarte-Biggs-Hotelling teaches Claim 20 for the same reasons described above for Claim 5 (§VIII.E.6). Ex-1020, Cl. 20.

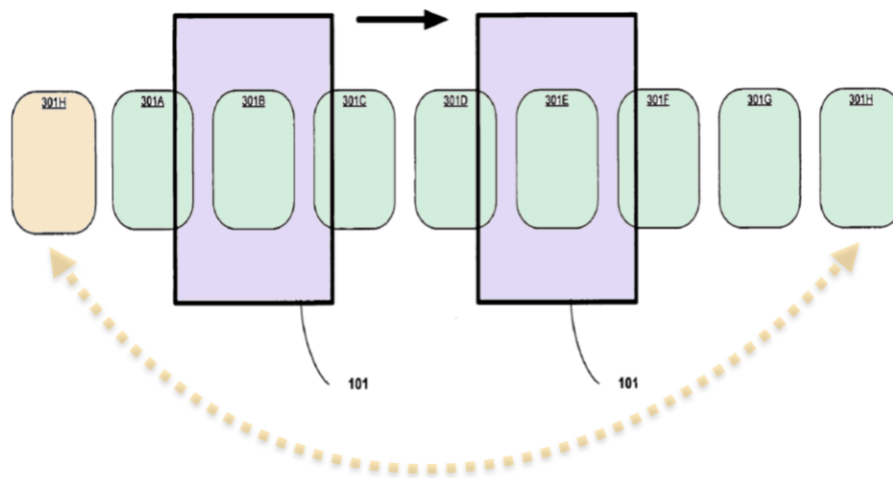
- 19. Dependent Claim 21: The method of claim 9, wherein said several available cards are organized in a virtual closed loop row or in a virtual closed loop column.**

346. Duarte-Biggs-Hotelling teaches Claim 21 for the same reasons described above for Claim 8 (§VIII.E.9). Ex-1020, Cl. 21.

- 20. Dependent Claim 22: The method of claim 9, wherein said several available cards are organized in a virtual closed loop row and in a virtual closed loop column**

347. Duarte-Biggs-Hotelling teaches Claim 22.

348. Duarte discloses “a closed loop row.” Referring to Figure 7 (annotated below), Duarte discloses a virtual closed loop row: “In one embodiment, **the sequence is circular**, so that the rightmost window 301 [301H] is considered to be to the left of the leftmost window 301 [301A]. Thus, moving off one end of the sequence takes the user back to the other end of the sequence.” Ex-1010, 8:17-22.



349. Duarte also discloses that “windows 301 could be arranged vertically instead of horizontally.” *Id.*, 7:40-41. So a POSITA would have understood that Duarte also discloses a virtual closed loop column. Moreover, Duarte also discloses that “Alternatively, a two-dimensional arrangement of windows 301 can be provided.” *Id.*, 7:41-43. In such a case, Duarte’s teaching of a closed loop row and a closed loop column would apply to the two dimensional arrangement of windows such that “several available cards are organized in a virtual closed loop row and in a virtual closed loop column.”

350. Thus, Duarte-Biggs-Hotelling teaches window 301 “organized in a virtual closed loop row and in a virtual closed loop column.”

21. Independent Claim 23

a. Element 23[preamble]: A wristwatch having

351. To the extent the preamble is limiting, Duarte-Biggs-Hotelling teaches the preamble for the same reasons described above for Element 1[preamble] (§VIII.E.2.a). Ex-1020, Element 23[pre].

b. Element 23[a]: a digital matrix display

352. Duarte-Biggs-Hotelling teaches Element 23[a] for the same reasons described above for Element 1[a] (§VIII.E.2.b). Ex-1020, Element 23[a].

c. Element 23[b]: a sheet of touch-sensitive glass

353. Duarte-Biggs-Hotelling teaches Element 23[b] for the same reasons described above for Element 1[b] (§VIII.E.2.c). Ex-1020, Element 23[b].

d. Element 23[c]: a processing circuit specifically laid out so as to interpret the signals from the touch-sensitive glass, for selecting a card from several available cards depending on these signals and for displaying said card on the entire digital matrix display, wherein each card has a distinct fixed or periodically refreshed image

354. Duarte-Biggs-Hotelling teaches Element 23[c] for the same reasons described above for Elements 1[c] (§VIII.E.2.d) and 1[e] (§VIII.E.2.f). Ex-1020, Element 23[c].

- e. **Element 23[d]: wherein said touch-sensitive glass is a two-dimensional glass for detecting a movement of at least one finger at any place on the touch-sensitive glass along at least two different directions**

355. Duarte-Biggs-Hotelling teaches Element 23[d] for the same reasons described above for Element 1[d] (§VIII.E.2.e). Ex-1020, Element 23[d].

- f. **Element 23[e]: [1] wherein said processing circuit is specifically laid out so as to cause said several available cards to scroll past by displaying the image of said cards one at a on the digital matrix display in order to lastingly replace the initially displayed card with a replacement card selected within said several available cards, [2] immediately after the scrolling and without further user intervention**

356. Duarte-Biggs-Hotelling teaches Element 23[e] for the same reasons described above for Elements 1[e] (§VIII.E.2.f) and 1[g] (§VIII.E.2.h). Portions of element 23[e][1] correspond to Element 1[e]; Element 23[e][2] corresponds to Element 1[g]. Ex-1020, Element 23[e].

357. The additional portion of 23[e][1] is “displaying the image of said cards one at a [sic.] on the digital matrix display,” which is disclosed by Duarte. Duarte discloses scrolling windows one at a time: “For example, the user can repeatedly drag windows 301 in a leftward direction to cause windows 301C, 301D, and 301E to *successively* occupy the central position.” Ex-1010, 7:60-63.

- g. Element 23[f]: wherein the size of the image corresponds to the size of said digital matrix display so that the displayed card occupies the whole of said digital matrix display**

358. Duarte-Biggs-Hotelling teaches Element 23[f] for the same reasons described above for Element 1[f] (§VIII.2.F.g). Ex-1020, Element 23[f].

- h. Element 23[g]: wherein said processing circuit is further laid out so that the replacement card is dependent from the initially displayed card and from the direction of said movement and is independent from the starting point and end point of said movement on said digital matrix display.**

359. Duarte-Biggs-Hotelling teaches Element 23[g] for the same reasons described above for Element 1[h] (§VIII.E.2.i). Ex-1020, Element 23[g]

22. Independent Claim 24

- a. Element 24[preamble]: A wristwatch having**

360. To the extent the preamble is limiting, Duarte-Biggs-Hotelling teaches the preamble for the same reasons described above for Element 1[preamble] (§VIII.E.2.a). Ex-1020, Element 24[pre].

- b. Element 24[a]: a digital matrix display**

361. Duarte-Biggs-Hotelling teaches Element 24[a] for the same reasons described above for Element 1[a] (§VIII.E.2.b). Ex-1020, Element 24[a].

- c. Element 24[b]: a sheet of touch-sensitive glass**

362. Duarte-Biggs-Hotelling teaches Element 24[b] for the same reasons described above for Element 1[a] (§VIII.E.2.c). Ex-1020, Element 24[b].

- d. Element 24[c]: [1] a processing circuit specifically laid out so as to interpret the signals from the touch-sensitive glass, for selecting a card from several available cards depending on these signals and [2] for displaying said card on the entire digital matrix display**

363. Duarte-Biggs-Hotelling teaches Element 24[c] for the same reasons described above for Elements 1[c] (§VIII.E.2.d) and 1[f] (§VIII.E.2.g). Element 24[c][1] corresponds to Element 1[c]; Element 24[c][2] corresponds to Element 1[f]. Ex-1020, Element 24[c].

- e. Element 24[d]: wherein said touch-sensitive glass is a two-dimensional glass for detecting a movement of at least one finger at any place on the touch-sensitive glass along at least two different directions**

364. Duarte-Biggs-Hotelling teaches Element 24[d] for the same reasons described above for Element 1[d] (§VIII.E.2.e). Ex-1020, Element 24[d].

- f. Element 24[e]: wherein said processing circuit is specifically laid out so as to cause cards to scroll past in order to lastingly replace the initially displayed card with a replacement card, wherein each card has a fixed or periodically refreshed image**

365. Duarte-Biggs-Hotelling teaches Element 24[e] for the same reasons described above for Element 1[e] (§VIII.E.2.f). Ex-1020, Element 24[e].

- g. Element 24[f]: wherein the size of the image corresponds to the size of said digital matrix display so that the displayed card occupies the whole of said digital matrix display**

366. Duarte-Biggs-Hotelling teaches Element 24[f] for the same reasons described above for Element 1[f] (§VIII.E.2.g). Ex-1020, Element 24[f].

- h. Element 24[g]: wherein said processing circuit is further laid out so that the replacement card is dependent from the initially displayed card and from the direction of said movement and is independent from the starting point and end point of said movement on said digital matrix display**

367. Duarte-Biggs-Hotelling teaches Element 24[g] for the same reasons described above for Element 1[h] (§VIII.E.2.i). Ex-1020, Element 24[g].

- i. Element 24[h]: wherein said several available cards are organized in a virtual closed loop row and in a virtual closed loop column**

368. Duarte-Biggs-Hotelling teaches Element 24[h] for the same reasons described above for Claim 22 (§VIII.E.20). Ex-1020, Element 24[h].

F. Ground 6: Claims 14-16 are obvious over the combination of Duarte, Biggs, and Hotelling in further view of Louch.

- 1. A POSITA would be motivated to combine Duarte, Biggs, and Hotelling's teachings with Louch's teachings and would have a reasonable expectation of success.**

369. As discussed above, (VIII.E.1) it would have been obvious to a POSITA to combine the teachings of Duarte, Biggs, and Hotelling to enable the

scrolling of windows described in Duarte on the touchscreen wristwatch of Biggs with selectable customized time displays.

370. It would have been obvious to further combine the teachings of Louch. Louch discloses a digital wristwatch like the one in Biggs. Ex-1005 ¶49. Similar to Duarte’s teachings of scrolling windows 301 on a touchscreen (Ex-1010, 5:38-41, 6:59-7:17), Louch describes scrolling widgets by moving a finger horizontally or vertically across a touchscreen (Ex-1005 ¶¶79, 80). Louch further teaches that various scrolling “animation are possible.” Ex-1005 ¶87. For example, Louch states, “The speed of the scrolling is controlled by the speed of the finger gestures made by the user.” *Id.* Louch also teaches that “The scrolling can be animated to give the impression of friction or other properties. For example, the user can make a single touch and gesture and widgets will be continuously scrolled by the display 514 in a Rolodex® manner and slowly de-accelerate to a stop.” *Id.*

371. Because Duarte and Louch both describe scrolling cards on a touchscreen, it would have been obvious to POSITA to apply the scrolling animations of Louch to the scrolling of windows 301 in Duarte.

372. Duarte teaches that “a transition effect is performed to enhance the smoothness of the transition as windows 301 move and/or snap into place.” Ex-1010, 8:5-9. A POSITA would have recognized that Louch’s scrolling animations are examples of “transition effects” as taught in Duarte, and thus, a

POSITA would have been motivated to apply Louch's animations to the scrolling in Duarte.

373. A POSITA would have been further motivated to apply Louch's animations to enhance the user experience by mimicking real-world effects (variable speed and friction) that are already familiar to users. Thus, design incentives and market forces would have motivated a POSITA to apply the teachings of Louch to the Duarte-Biggs-Hotelling combination of a wristwatch with a touchscreen.

2. Dependent Claim 14: The method of claim 13, wherein the card scrolling speed or amplitude depend on the speed or amplitude of movement of the finger on the two-dimensional touch-sensitive glass.

374. Duarte-Biggs-Hotelling-Louch teaches Claim 14.

375. Louch explicitly states: "Scrolling can be horizontal, vertical and diagonal. The speed of the scrolling is controlled by the speed of the finger gestures made by the user." Ex-1005 ¶87.

3. Dependent Claim 15: The method of claim 14, wherein the card scrolling speed is variable, the scrolling being slowed down before stopping completely.

376. Duarte-Biggs-Hotelling-Louch teach Claim 15.

377. Louch teaches various scrolling animations that "give the impression of friction or other properties." Ex-1005 ¶87. For example, Louch states that "the user can make a single touch and gesture and widgets will be continuously scrolled

by the display 514 in a Rolodex® manner and *slowly de-accelerate to a stop.*” *Id.* ¶87.

4. Dependent Claim 16: The method of claim 15, wherein the card scrolling speed is variable, the scrolling being slowed down each time a card is switched to another one

378. Duarte-Biggs-Hotelling-Louch teaches Claim 16.

379. Duarte-Biggs-Hotelling-Louch teaches “the card scrolling speed is variable” for the same reasons described above for Claim 15 (§VIII.F.3).

380. Louch also disclose “the scrolling being slowed down each time a card is switched to another one” as recited in Claim 16. Louch states that widgets scroll “in a Rolodex® manner and slowly de-accelerate to a stop.” Ex-1005 ¶87. In a Rolodex, the cards flip one after the other and slow down as each one is flipped due to friction, which Louch teaches to mimic. Ex 1005 ¶87. In other words, the scrolling is “slowed down each time a card is switched to another one” as recited in Claim 16.

381. Thus it is my opinion that Duarte-Biggs-Hotelling-Louch teaches the card scrolling speed is variable, the scrolling being slowed down each time a card is switched to another one.

IX. CONCLUSION

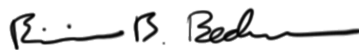
382. For the reasons set forth above, I believe that Claims 1-24 of the ’922 Patent is unpatentable in view of the prior art.

383. In signing this declaration, I recognize that it will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place in the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

384. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises and to take into account new information as it becomes available to me.

385. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Benjamin B. Bederson", written in a cursive style.

Benjamin B. Bederson

Date: October 4, 2023