

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

**HP INC.; DELL TECHNOLOGIES INC.; DELL INC.;
ASUSTEK COMPUTER INC.; and ASUS GLOBAL PTE. LTD.,**
Petitioner

v.

LITL LLC,
Patent Owner

IPR2024-0404
U.S. Pat. No. 8,624,844

DECLARATION OF ANDREW WOLFE, PHD

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 2. [1a], [10a], [18a] a base including a keyboard; 52

 3. [1b] a main display component rotatably coupled to the base “”

 [10b] a main display component rotatably coupled to the base and including the single display screen which displays content;

 [18b] a main display component including the single display screen configured to display content;.....53

4. [1c] such that the main display component and the base are rotatable with respect to one another about a longitudinal axis running along an interface between the main display component and the base to transition between at least the laptop mode and the easel mode, the main display component including the single display screen,

[10c] a hinge assembly disposed at least partially within the base and the main display component that defines an axis of rotation about which both the base and the main display component are rotatable to transition the portable computer between at least the laptop mode and the easel mode,

[18c] a hinge assembly disposed at least partially within the base configured to rotatably couple the main display component to the base, the hinge assembly defining a longitudinal axis running along an interface between the display component and the base about which the display component and the base are rotatable to transition the portable computer between at least the laptop mode and the easel mode, ...54
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6. [1e], [10e], [18e] the laptop mode is configured to display to a user on the main display component a first content mode having a first content display orientation with the main display component oriented towards the user and the keyboard oriented to receive input from the user; 60
7. [1f], [10f], [18f] the easel mode is configured to display to the user on the main display component a second content mode having a second content display orientation with the main display component oriented towards the user and the keyboard oriented away from the user,

	wherein the first and second content display orientations are 180 degrees relative to each other, and wherein the portable computer is operable in the easel mode to enable the user to interact with displayed content without interacting with the keyboard; and.....	62
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LIST OF EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 8,624,844
1002	Declaration of Dr. Andrew Wolfe
1003	File History for U.S. Patent No 8,624,844
1004	IPR2021-00822, Paper 6 (Institution Decision)
1005	Reexamination File History for U.S. Patent No 8,624,844
1006	WIPO Pub. No. WO 95/24007 (“Lane”)
1007	Windows XP Pro – The Missing Manual (“Pogue”)
1008	U.S. Pat. No. 6,771,494 (“Shimano”)
1009	U.S. Pat. Pub. No. 2006/0017692 A1 (“Wehrenberg”)
1010	“The \$100 Laptop Moves Closer to Reality,” c net News.Com.com (September 28, 2005) (“MIT”)
1011	“\$100 Laptop Idea Taking Off,” TechTalk (Vol. 50, No. 4, October 5, 2005)
1012	U.S. Pat. Pub. No. 2006/0183512 A1 (“Segawa”)
1013	First Amended Complaint in 1:23-cv-00120-RGA
1014	Complaint in 1:23-cv-00120-RGA
1015	U.S. Pat. No. 5,689,667 (“Kurtenbach”)
1016	UK Patent Application No. GB2321982A (“Välikangas”)
1017	U.S. Pat. Pub. No. 2006/0264243 (“Aarras”)
1018	U.S. Patent No. 5,436,954 (“Nishiyama”)
1019	U.S. Patent No. 7,061,472 (“Schweizer”)
1020	U.S. Pat. Pub. No. 2006/0026535 (“Hotelling”)
1021	United States District Courts —National Judicial Caseload Profile
1022	Excerpt from PC Magazine (9/26/1995)
1023	Advertisement in InfoWorld, The Newsweekly for Microcomputer Users, Vol. 4, No. 46 (November 22, 1982)
1024	Advertisement in BYTE (September 1990)
1025	Chinese Patent Application No. CN2627170Y;
1026	Certified English Translation of CN2627170Y (“Lin”)
1027	U.S. Pat. Pub. No. 2006/0034042 (“Hisano”)
1028	U.S. Pat. No. 6,154,359 (“Kamikakai”)

Exhibit No.	Description
1029	U.S. Pat. No. 7,768,508 (“Okuley”)
1030	U.S. Pat. No. 5,949,408 (“Kang”)
1031	U.S. Pat. No. 2,880,617 (“Cotton”)
1032	U.S. Pat. No. 6,851,711 (“Goertzen”)
1033	U.S. Pat. No. 7,408,506 (“Miller”)
1034	Declaration of Jakob Ben-Ezra

1. I, Dr. Andrew Wolfe, have been engaged by HP Inc. as an independent expert in this action. I expect to testify concerning the subjects outlined in this report.

2. As part of that engagement, I have been asked to provide analysis and expert opinions on U.S. Pat. No. 8,624,844 (the “844 patent”).

3. I am being compensated for the time I have spent on this matter at the rate of \$650 per hour. My compensation does not depend in any way upon the outcome of this proceeding.

4. In reaching the conclusions described herein, I have considered the documents and materials identified in the Index of Exhibits that is attached to this report, in addition to any materials cited in this report. My opinions are also based upon my education, training, research, knowledge, and personal and professional experience.

5. Based on my review of the 844 patent and its prosecution history, the other materials I have considered, and my knowledge and experience, my opinions are as follows:

- Claims 1, 3, 4, 7-10, 13, 14, 16, 18, 22 are unpatentable due to obviousness based on Lane and Pogue in view of the knowledge of a POSITA.

- Claims 1, 3, 4, 7-10, 13, 14, 16, 18, 22 are unpatentable as obvious over Lane, Pogue and Hotelling in view of the knowledge of a POSITA.
- Claim 17 is unpatentable as obvious over Lane, Pogue and Segawa in view of view of the knowledge of a POSITA.
- Claims 1, 3, 4, 7-10, 13, 14, 16, 18, 22 are unpatentable as obvious over Lane, Pogue and MIT in view of the knowledge of a POSITA.
- Claims 1, 3, 4, 7-10, 13, 14, 16, 18, 22 are unpatentable as obvious over Lane, Pogue, MIT and Hotelling in view of the knowledge of a POSITA.
- Claim 17 is unpatentable as obvious over Lane, Pogue, MIT and Segawa in view of the knowledge of a POSITA.

I. BACKGROUND AND QUALIFICATIONS

A. Qualifications

6. A full description of my educational background, professional achievements, qualifications, and publications in the past 30+ years are set forth more fully in my curriculum vitae, which is attached to this Declaration as Exhibit

A. Here, I provide a brief summary of my background and qualifications.

7. I am the founder and sole employee of Wolfe Consulting. Through Wolfe Consulting, I provide technical and business analytics to businesses on

processor technology, computer systems, consumer electronics, software, design tools, data security, cryptography and intellectual property issues. I have more than thirty five years' experience developing products, researching, consulting, and teaching in those fields. In that time, I have worked as a computer architect, computer system designer, and as an executive in the PC and electronics business. I have also taught at some of the world's leading institutions in those fields, including Stanford University, Princeton University, Carnegie Mellon University, and Santa Clara University.

8. In 1985, I earned the B.S.E.E. degree in Electrical Engineering and Computer Science from the Johns Hopkins University. In 1987, I received the M.S. degree in Electrical and Computer Engineering from Carnegie Mellon University and in 1992, I received the Ph.D. degree in Computer Engineering from Carnegie Mellon University. My doctoral dissertation proposed a new approach for the architecture of a computer processor.

9. I have more than 35 years of experience as a computer architect, computer system designer, personal computer graphics designer, educator, and executive in the electronics industry.

10. I have extensive experience in the design, development, and analysis of portable computing devices including portable PCs. In the mid-late 1980s I worked as part of the development team for the Linus Write-Top, which is

commonly acknowledged to be the first commercial tablet computer. I later worked on screen technology for many handheld computing devices including the Motorola Envoy and prototypes for the Apple Newton. In 1997, I was hired to run the research efforts at S3, Inc. At the time S3 produced the 3D graphics hardware and driver software for more than half of new PCs, worldwide. I managed our display technology group. I led the development of components for laptop computers including the IBM Thinkpad and for desktop computers as well. I also worked with the teams that developed the FrontPath wireless tablet PC and the Diamond Mako handheld computer.

11. In these roles, I managed relationships with numerous laptop computer companies including IBM, Toshiba, and Compaq as well as key software providers such as Microsoft.

12. I have consulted, formally and informally, for a number of fabless semiconductor companies. In particular, I have served on the technology advisory boards for two media processor design companies: BOPS, Inc., where I chaired the board, and Siroyan Ltd., where I served in a similar role; for three networking chip companies – Intellon, Inc., Comsilica, Inc., and Entridia, Inc.; and for one 3D game accelerator company, Ageria, Inc.

13. I have also served as a technology advisor to Motorola and to several venture capital funds in the U.S. and Europe. Currently, I am a director at Turtle

Beach Corporation, providing guidance in its development of commercial electronic products primarily related to video gaming.

14. From 1991 through 1997, I served on the Faculty of Princeton University as an Assistant Professor of Electrical Engineering. At Princeton, I taught undergraduate and graduate-level courses in Computer Architecture, Advanced Computer Architecture, Display Technology, and Microprocessor Systems, and conducted sponsored research in the area of computer systems and related topics. From 1999 through 2002, I taught a Computer Architecture course to both undergraduate and graduate students at Stanford University multiple times as a Consulting Professor. At Princeton, I received several teaching awards, both from students and from the School of Engineering. I have also taught advanced microprocessor architecture to industry professionals in IEEE and ACM sponsored seminars. I am currently a lecturer at Santa Clara University teaching courses on Microprocessor Systems, Advanced Logic Design, Real-Time Computing, and Mechatronics.

15. I have published more than fifty peer-reviewed papers in computer architecture and computer systems. I have also chaired IEEE and ACM conferences in microarchitecture and integrated circuit design and served as an associate editor for IEEE and ACM journals. I served on the IEEE Computer Society Awards committee. I am an IEEE Fellow and an IEEE Computer Society

Distinguished Contributor. I am a named inventor on at least fifty-seven U.S. patents and thirty-seven foreign patents, including patents related to display technology.

16. I have been the invited keynote speaker at the ACM/IEEE International Symposium on Microarchitecture and at the International Conference on Multimedia. I have also been an invited speaker on various aspects of technology or the PC industry at numerous industry events including the Intel Developer's Forum, Microsoft Windows Hardware Engineering Conference, Microprocessor Forum, Embedded Systems Conference, Comdex, and Consumer Electronics Show as well as at the Harvard Business School and the University Illinois Law School. I have been interviewed on subjects related to technology and the electronics industry by publications such as the Wall Street Journal, New York Times, LA Times, Time, Newsweek, Forbes, and Fortune as well as CNN, NPR, and the BBC. I have also spoken at dozens of universities including MIT, Stanford, University of Texas, Carnegie Mellon, UCLA, University of Michigan, Rice University, and Duke University.

B. Materials Reviewed

17. In preparing this declaration, I have reviewed and/or considered at least the documents cited in the List of Exhibits and the documents referenced in

this declaration. I have also reviewed the entire prosecution history of the 844 patent.

II. RELEVANT LEGAL STANDARDS

18. I am not an attorney. For the purposes of this declaration, I have been informed by counsel for Petitioner about certain aspects of the law that are relevant to forming my opinions. My understanding of the law is as follows.

A. Burden of Proof

19. I understand that a petitioner must demonstrate unpatentability by a preponderance of the evidence. I understand preponderance means more likely than not in this context.

B. Legal Standards for Prior Art

20. I understand that a patent or other publication must first qualify as prior art before it can be used to invalidate a patent claim.

21. I understand that a U.S. or foreign patent qualifies as prior art to an asserted patent if the date of issuance of the patent is prior to the invention of the asserted patent.

22. I further understand that a printed publication, such as an article published in a magazine or trade publication, qualifies as prior art to an asserted patent if the date of publication is prior to the invention of the asserted patent.

23. I understand that a U.S. or foreign patent also qualifies as prior art to an asserted patent if the date of issuance of the patent is more than one year before the filing date of the asserted patent.

24. I further understand that a printed publication, such as an article published in a magazine or trade publication, constitutes prior art to an asserted patent if the publication occurs more than one year before the filing date of the asserted patent.

25. I also understand that a U.S. patent qualifies as prior art to the asserted patent if the application for that patent was filed in the United States before the invention of the asserted patent.

C. Person of Ordinary Skill in the Art

26. I understand that my assessment of the claims of the 249 patent and the teachings of the prior art and my analysis and opinions herein must be undertaken from the perspective of what would have been known or understood by a person having ordinary skill in the art, reading the 844 patent on its priority date and in light of the specification and file history of the 844 patent. I refer to such a person as a “POSITA.”

27. I further understand that in determining the level of ordinary skill in the art, I may consider factors including:

(a) the type of problems encountered in the art or field of invention,

- (b) prior art solutions to those problems,
- (c) the rapidity with which innovations are made,
- (d) sophistication of the technology, and
- (e) the educational level of active workers in the field.

28. I understand that a person of ordinary skill in the art is not a specific real individual, but rather a hypothetical individual having the qualities reflected by the factors above. This hypothetical person has knowledge of all prior art in the relevant field and takes from each reference what it would teach to a person having the skills of a POSITA.

D. Anticipation

29. I understand that a patent claim may be “anticipated” if each element of that claim is present either explicitly or inherently in a single prior art reference, and that the elements should be arranged in the reference as in the claim. I understand that for a claimed limitation to be inherently present, the prior art reference need not expressly disclose the limitation, therefore long as the claimed limitation necessarily flows from a disclosure in the reference.

E. Obviousness

30. I understand that a patent claim can be considered to have been obvious to a person of ordinary skill in the art at the time of the claimed invention. This means that, even if all of the requirements of a claim are not found in a single

prior art reference, the claim is not patentable if the differences between the prior art and the subject matter in the claim would have been obvious to a person of ordinary skill in the art at the time of the claimed invention.

31. I understand that a person of ordinary skill in the art provides a reference point from which the prior art and claimed invention should be viewed. This reference point prevents one from using his or her own insight or hindsight in deciding whether a claim is obvious.

32. I also understand that an obviousness determination includes the consideration of various factors such as (1) the scope and content of the prior art, (2) the differences between the prior art and the asserted claims, (3) the level of ordinary skill in the pertinent art, and (4) the existence of secondary considerations such as commercial success, long-felt but unresolved needs, failure of others, etc.

33. I understand that an obviousness evaluation can be based on a combination of multiple prior art references.

34. I also understand that the prior art references themselves may provide a suggestion, motivation, or reason to combine, but other times the nexus linking two or more prior art references is simple common sense.

35. I further understand that obviousness analysis recognizes that market demand, rather than scientific literature, often drives innovation, and that a

motivation to combine references may be supplied by the direction of the marketplace.

36. I understand that 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 is obvious unless its actual application is beyond his or her skill.

37. I also understand that practical and common sense considerations should guide a proper obviousness analysis, because familiar items may have obvious uses beyond their primary purposes. I further understand that a person of ordinary skill in the art looking to overcome a problem will often be able to fit together the teachings of multiple publications. I understand that obviousness analysis therefore takes into account the inferences and creative steps that a person of ordinary skill in the art would employ under the circumstances.

38. I understand that a particular combination may be proven obvious merely by showing that it was obvious to try the combination. For example, when there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp because the result is likely the product not of innovation but of ordinary skill and common sense.

39. The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. When a work is available in one field of endeavor, 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 can implement a predictable variation, the patent claim is likely obvious.

40. It is further my understanding that a proper obviousness analysis focuses on what was known or obvious to a person of ordinary skill in the art, not just the patentee. Accordingly, I understand that any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.

41. I understand that a proposed obviousness combination does not need to be the preferred, or most desirable, combination available, in order to render a claim obvious. Instead, there must be something that suggests the desirability of the proposed combination, not necessarily something that suggests that the proposed combination is the most desirable combination available.

42. Similarly, I understand that for purposes of obviousness, when a motivating benefit comes at the expense of another benefit, that does not nullify the proposed obviousness combination or modification. Likewise, a proposed

obviousness combination does not fail merely because it may be inferior to other systems used for the same use.

43. I also understand that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements between the multiple references. Likewise, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. Instead, the test is whether a claim is rendered obvious by the teachings of the prior art as a whole.

44. I understand that a claim can be obvious in light of a single reference, without the need to combine references, if the elements of the claim that are not found explicitly or inherently in the reference can be supplied by the common sense of one of skill in the art.

45. I understand that in considering obviousness, I should keep in mind that a person of ordinary skill in the art has ordinary creativity and is not an automaton.

46. I understand that in considering obviousness, it is improper to determine obviousness using the benefit of hindsight derived from the patent being considered.

47. I understand that secondary indicia of non-obviousness may include:
(1) a long felt but unmet need in the prior art that was satisfied by the invention of

the patent; (2) commercial success of processes covered by the patent; (3) unexpected results achieved by the invention; (4) praise of the invention by others skilled in the art; (5) taking of licenses under the patent by others; (6) deliberate copying of the invention; (7) failure of others to find a solution to the long felt need; and (8) skepticism by experts.

48. I also understand that there must be a relationship between any such secondary considerations and the invention. I further understand that contemporaneous and independent invention by others is a secondary consideration supporting an obviousness determination.

49. In sum, my understanding is that prior art teachings are properly combined where a person of ordinary skill in the art having the understanding and knowledge reflected in the prior art and motivated by the general problem facing the inventor, would have been led to make the combination of elements recited in the claims. Under this analysis, the prior art references themselves, or any need or problem known in the field of endeavor at the time of the invention, can provide a reason for combining the elements of multiple prior art references in the claimed manner.

F. Priority/Written Description

50. Petitioner's counsel has informed me that it is elementary patent law that a patent application is entitled to the benefit of the filing date of an earlier filed

application only if the disclosure of the earlier application provides support for the full scope of the claims of the later application, as required by 35 U.S.C. § 112. Petitioner's counsel has informed me that when a priority claim involves a chain of priority documents, each application in the chain leading back to the earlier application must comply with the written description requirement of 35 U.S.C. § 112. Petitioner's counsel has informed me that, to satisfy the written description requirement of 35 U.S.C. § 112, the disclosure of the earlier filed application must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, the inventor was in possession of the invention. Petitioner's counsel has informed me that a prior application that merely renders the later-claimed invention obvious is not sufficient to meet the written description requirement—it must describe the claimed invention with all its limitations. Similarly, Petitioner's counsel has informed me that it is not sufficient for purposes of the written description requirement of § 112 that the disclosure, when combined with the knowledge in the art, would lead one to speculate as to modifications that the inventor might have envisioned, but failed to disclose.

51. Petitioner's counsel has informed that even when each element may be individually described in the specification, the lack of adequate description of their combination renders those claimed combinations invalid under Section 112. Petitioner's counsel has informed me that it is not enough that applicant show

where each claimed element resides in the earliest filed application but applicant must also provide support for the linkage of the claimed elements creating the embodiment. Petitioner's counsel has informed that a patent owner cannot show written description support by picking and choosing claim elements from different embodiments that are never linked together in the specification. Petitioner's counsel has informed that a description that merely renders the invention obvious does not satisfy the written description requirement.

III. THE 844 PATENT

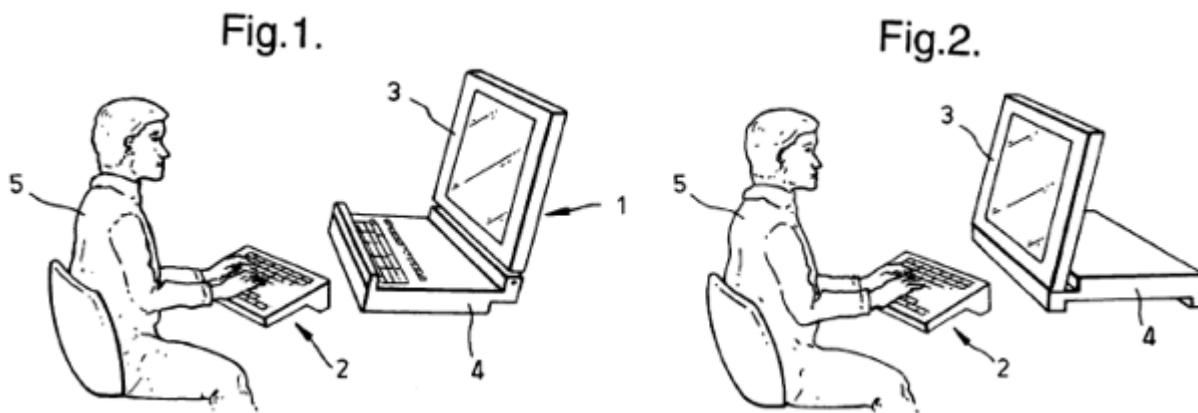
A. State of the Art Prior to the 844 Patent

52. Before I address the 844 patent, which relates to portable laptop computers that a user can manipulate into different physical configurations, I will briefly review various aspects of the state of the art prior to the 844 patent.

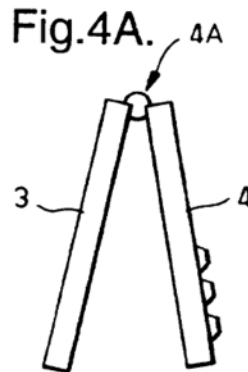
1. Configurable Portable Computers

53. Portable laptop (or notebook) computers were known for decades before the 844 Patent. EX1023 (advertisement for Epson HX-20). Many models had a base and a display connected by a hinge assembly that would allow the user to rotate the display from a closed position past 90 degrees to an open, desktop-like position for use. This design is sometime called a "clamshell" design. Early examples of this design included the Dell 316LT laptop and Toshiba's T3100SX laptop, both available in the late 1980s and early 1990s. EX1024.

54. By the early 2000s, computer manufacturers had begun developing portable computers that could be opened past 180 degrees into multiple different configurations. For example, Fujitsu described such a notebook computer in a 2004 patent application filed in the UK. EX1016 (“Välikangas”). The Välikangas application explained that a conventional notebook computer could be used with an external keyboard as shown in Figure 1, but that in such a configuration the user would be too far from the computer screen. EX1016, 4. To address this problem, Välikangas’s notebook computer had a “screen...capable of rotating through 270° about its hinge from the closed position” so that the notebook computer could be “placed with its integral keyboard face down on a work surface thereby permitting location of the external keyboard nearer the screen.” EX1016, 1; see also EX1016, 5-7.

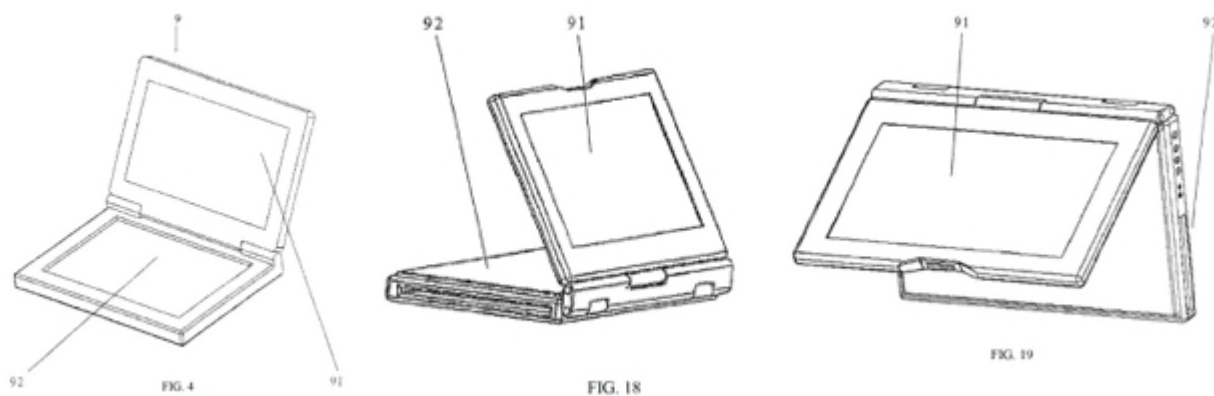


EX1016, Figs. 1-2. “Alternatively, with the screen open to an angle of 270° the notebook can be stood on its ends in an ‘A’ shaped configuration,” as illustrated in Figure 4A. EX1016, 1; *see also* EX1016, 8.



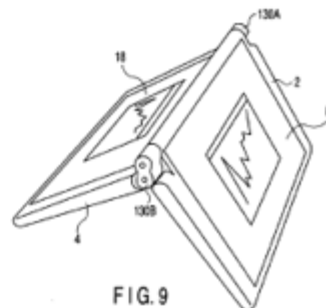
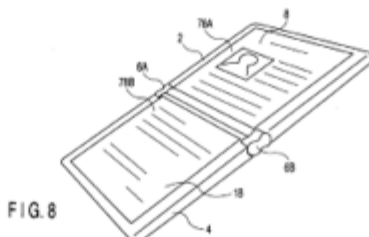
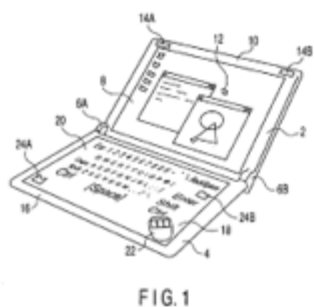
EX1016, Fig. 4A.

55. Another example is discussed in a Chinese patent that was filed in 2003 and issued in 2004. EX1026 (“Lin”). This patent shows a portable device such as a “notebook computer” or “portable video player” in which a display screen and an operating surface are connected via a double-hinge assembly. EX1026, 6:7-10, 6:23-27. The display screen can open to any angle between 0 and 360 degrees. EX1026, 6:43.



EX1026, Figs. 4, 18, 19. Figure 4 shows the notebook computer in a standard “opened” configuration. EX1026, 5:18-19. Figures 18 and 19 show that the portable computer can be rotated beyond 180 degrees, up to 360 degrees, and placed in different configurations. EX1026, 7:11-18.

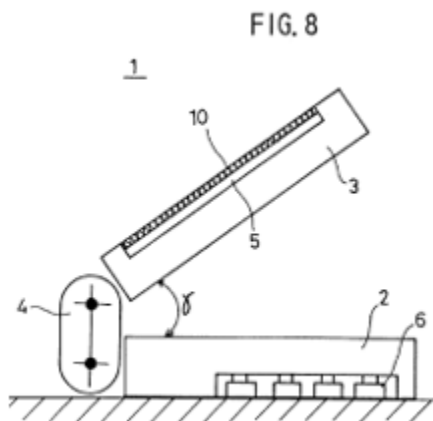
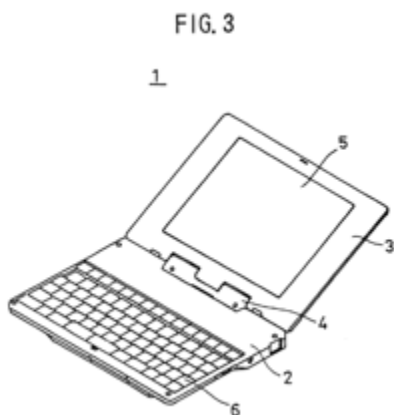
56. Toshiba filed a U.S. patent application in 2005 (claiming priority to a 2004 Japanese application) describing another portable computer that could be put in multiple different configurations. EX1027 (“Hisano”). This laptop included a virtual keyboard that is displayed on one of two display panels, rather than having a conventional mechanical keyboard. EX1027 ¶¶[0054], [0058]. The two display panels are included in housings that are rotatably coupled to one another to allow them to rotate beyond 180 degrees. EX1027 ¶¶[0054], [0058], [0087], [0098].



EX1027, Figs. 1, 8, and 9.

57. A much earlier patent, issued to Fujitsu in 2000 but claiming priority to a 1996 Japanese patent application, showed a portable computer with hinges allowing the screen to fold beyond 180 degrees into a position in which the keyboard is oriented down toward the desktop and the screen is facing the user.

EX1028 (“Kamikakai”).



EX1028, Figs. 3 and 8.

58. Intel Corporation filed a patent application in 2006 (that later issued in 2010) describing a “notebook PC” that can be configured into a “television form factor” as well as a “tablet PC form factor.” EX1029 (“Okuley”), 2:53-58.

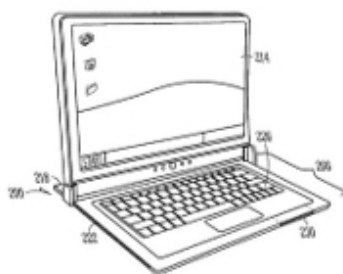


FIG. 2A

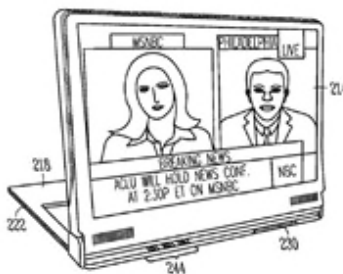


FIG. 2B



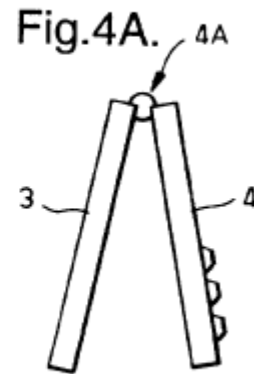
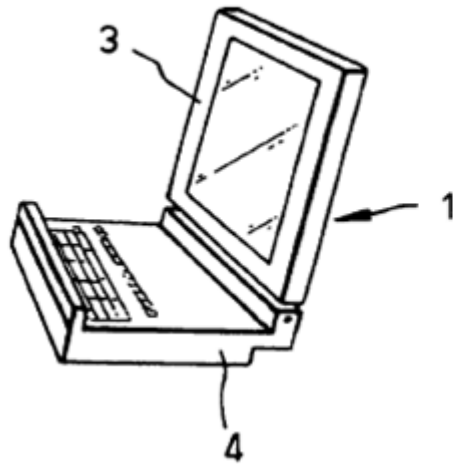
FIG. 2C

EX1029, Figs. 2A, 2B (partial), and 2C.

59. Thus, multiple examples of configurable laptop computers were known in the industry well before the 844 Patent.

2. Using Sensors to Reorient the Display

60. Industry participants and researchers recognized that a physically reconfigurable laptop computer would need to adjust the user interface (or graphical/textual display) to reorient to match the position of the hardware. For example, I discussed a Fujitsu patent application above (EX1016) that described a notebook computer that could be reconfigured from a standard, desktop-like mode with the hinge assembly near the desktop to an “A” shaped configuration with the hinge assembly at the top.



EX1016, Fig. 1 (partial), Fig. 4A. Fujitsu noted that, regarding the “A” shaped configuration in Figure 4A, “[i]n this mode the screen display needs inverting.” EX1016, 1; *see also* EX1016, 5 (As illustrated in Figure 4A, “the angle will be greater than 270° and the image will need reversing, top to bottom.”).

61. The display also needs to be reoriented when the device is shifted from landscape to portrait view, as discussed in a Hewlett-Packard patent from 1999 (based on a 1997 application). EX1030 (“Kang”). That patent described a “computer device, for instance a palmtop personal organizer, [that] has a dual-orientation display device with both portrait and landscape modes for viewing.” EX1030, Abstract.

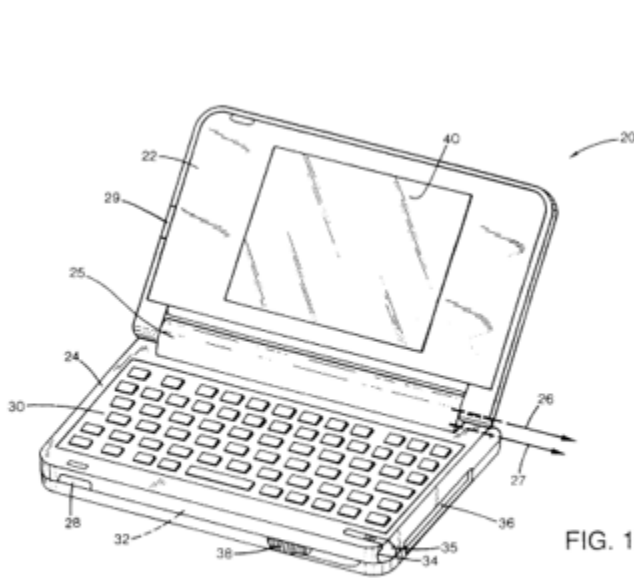


FIG. 1

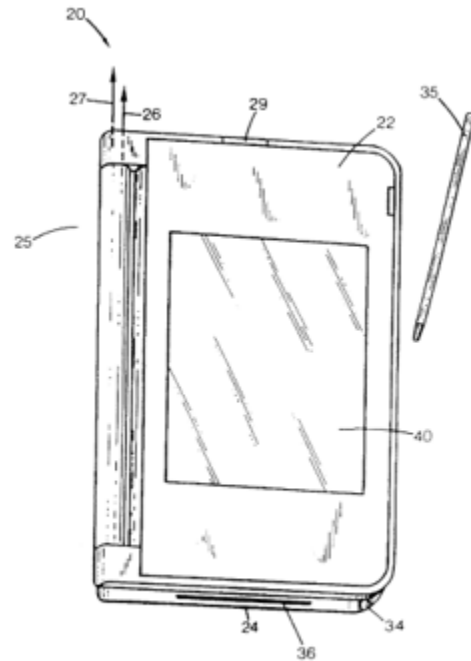


FIG. 2

EX1030, Figs. 1-2. The LCD screen on this device is composed of “row electrodes” and “column electrodes.” EX1030, 10:12-20. To rotate the screen 90 degrees from landscape to portrait (or vice versa), the device effectively swaps its control of the row electrodes and column electrodes, causing a reorientation of the image displayed on the screen. EX1030, 10:21-31.

62. The Hisano patent application I discussed above also recognized that the content displayed on the screen may need to be reoriented when the portable computer is physically reoriented, for example from the configuration in Figure 1 to the configuration in Figure 9.

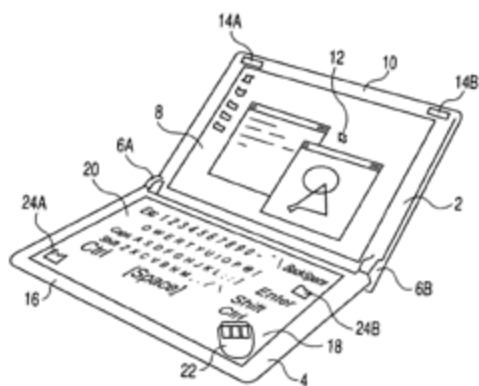


FIG. 1

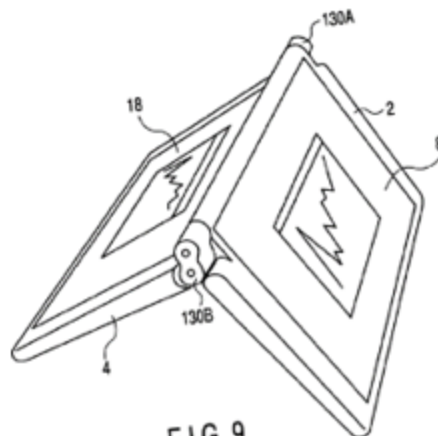


FIG. 9

EX1027, Figs. 1 and 9. The Hisano inventors recognized that the displayed content could be flipped based on the angle of the device's hinges: "the rotating angle of the hinges 130A and 130B may be used to switch between the display of a side of the screen closer to the hinges as the top and the display of a side of the screen farther from the hinges 130A and 130E as the top." EX1027 ¶[0099].

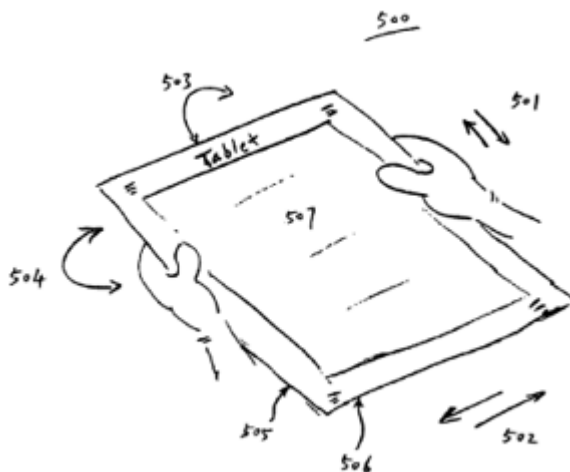
Alternatively, the display could be flipped based on input from a gravity sensor:

"Further, the personal computer may comprise a sensor that senses the direction of gravity so as to automatically switch the top and bottom of the display screen regardless of the angle of the hinges 130A and 130B or the placement of the personal computer." EX1027 ¶[0099].

63. A person of ordinary skill in the art¹ would have known to use sensors to detect the orientation of a configurable computer to assist the operating system

¹ I describe such a person below in Section III.C.

or other software in correctly orienting the user interface or displayed content. For example, Apple filed a patent application in 2004 (that issued in 2010) entitled “Methods and Apparatuses for Operating a Portable Device Based on an Accelerometer.” EX1009 (“Wehrenberg”). Wehrenberg states that “an accelerometer has been used within a portable device, such as, for example, a laptop computer [or] a tablet PC...” EX1009, 3:54-58. The accelerometer “may constantly or periodically monitor the movement of the portable device” and “may be used to detect a movement of a portable device and an orientation of the portable device may be determined based on the movement data provided....” EX1009, 7:28-30, 14:42-43. The orientation information can be used to change the display. For example, the patent states that “certain movements may be used to ‘zoom in’ or ‘zoom out’ on the displayed page...[f]or example, a user may tilt up the portable device as a way to zoom out and may tilt down the device as a way to zoom in.” EX1009, 11:43-52. Figure 5A illustrates various directions in which a device may be tilted in order to zoom in or out:



EX1009, Fig. 5A.

64. Various accelerometers (as used in the Apple patent) were known in the art before the '229 Patent. Accelerometers were widely available before 2008 and used in various electronic products. EX1009. A mercury switch (which I will discuss further below) is one type of accelerometer. EX1031, 1:34-35 (referring to “an accelerometer, such as a mercury switch”); EX1032, 5:3-7 (“accelerometer 204 can be an appropriately damped pendulum mercury switch”); EX1033, 3:12-16 (“Accelerometer 114 is a device that measures the acceleration of a moving body, such as, for example, the acceleration of the mobile device... [it] may be in the form of a motion-triggered switch (i.e., a mercury switch, a micro-electronic mechanical switch, etc.).”).

B. Overview of the 844 Patent

65. The 844 patent is titled “Portable Computer with Multiple Display Configurations.” EX1001, code (54). The portable computer system of the 844

patent has a conventional “clamshell” configuration that is movable into different configurations, also referred to as display modes, including (1) a laptop mode, (2) an easel mode, and (3) a frame mode.

66. Figure 17 of the 844 patent, reproduced below, illustrates a portable computer in laptop mode in which the portable computer has a conventional laptop appearance, with the display inclined at a viewing angle from the base. EX1001, 6:26–28 and 5:13–15.

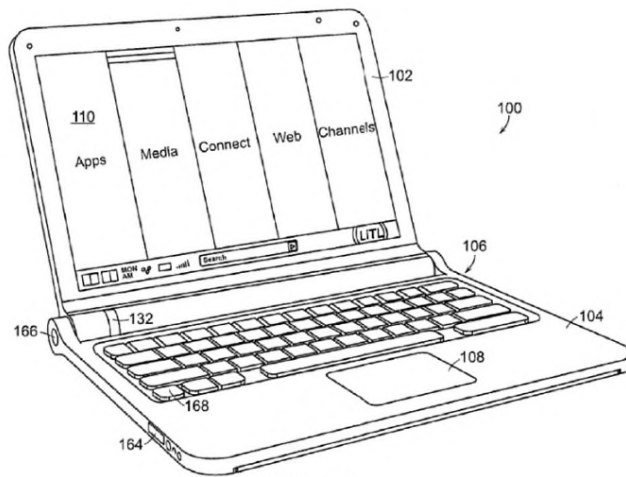


FIG. 17

67. Figure 4 of the 844 patent, reproduced below, illustrates a portable computer in easel mode in which the base of the computer and its display stand upright forming an inverted “V,” and the display and keyboard are on opposite sides. EX1001, 7:48–61 and 4:47–48.

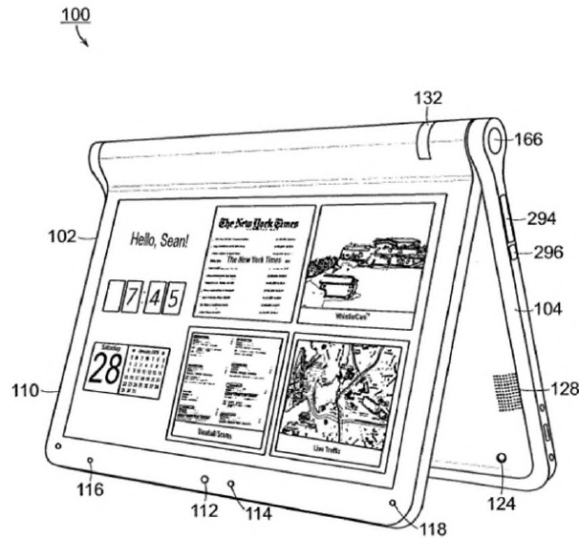


FIG. 4

68. Figure 26 of the 844 patent, reproduced below, illustrates a portable computer configured into frame mode, in which the display and base are at a similar orientation and angle as in easel mode, but with the base lying flat on a surface and the keyboard facing down. EX1001, 16:3-13; 5:35-37.

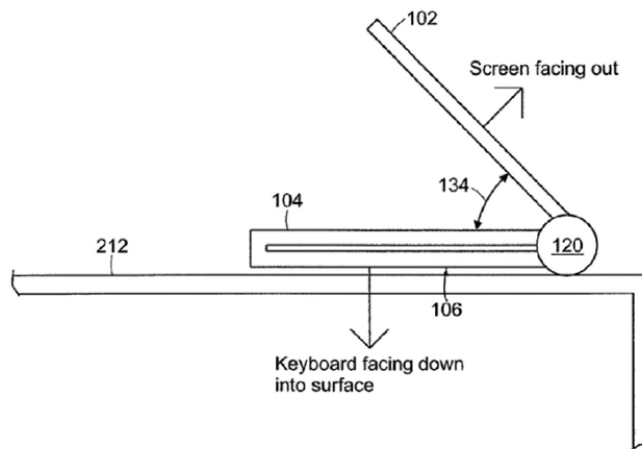


FIG. 26

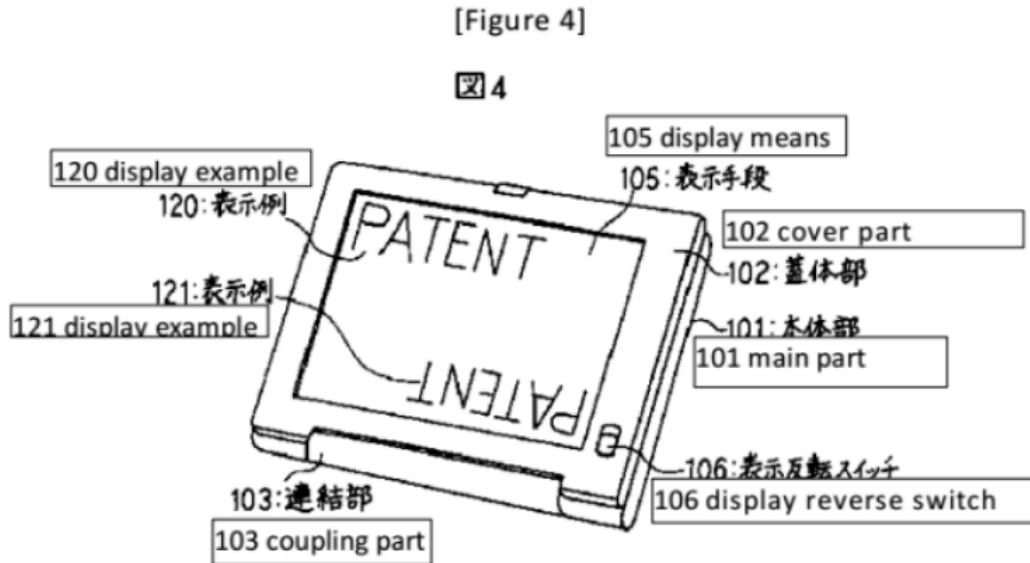
69. The 844 patent explains that the display's orientation can change based on the display mode into which it is configured or in response to a user's input. *Id.* at 2:42–44.

C. Overview of the 844 patent's File History

70. Earlier versions of the 844 patent claims were rejected for obviousness multiple times over combinations of references including Aarras (EX1017), Nishiyama (EX1018), and Schweizer (EX1019), as well as for double patenting. EX1003, 811-818, 749-755, 673-688, and 599-618 (4/4/11, 10/28/11, 6/7/12, and 2/1/13 office actions). The claims were finally allowed only after an examiner's amendment that added a "frame mode" limitation to all claims. EX1003, 52-53 (8/22/13 Notice of Allowability at 2-3).

D. Overview of the Prior IPR for the 844 Patent

71. Lenovo filed a petition challenging claims 1-16 and 18-22 of the 844 patent in IPR2021-00822 (the "822IPR"). EX1004 (822IPR Institution Decision), 2. Each of the five grounds in the 822IPR was an obviousness challenge based in part on Shimura. *Id.*, 6. The 822IPR petition alleged that Shimura's Fig. 4, reproduced below with annotations included, constituted a frame mode:



Id., 12. It is my understanding that the Board disagreed, finding that Shimura’s Fig. 4 depicted a tablet mode rather than the claimed frame mode, and denied institution of the 822IPR solely for that reason. *Id.*, 12-13.

E. Overview of the Ex-Parte Reexamination of the 844 Patent

72. After institution of the 844IPR was denied, Lenovo requested, and the U.S. Patent Office ordered, ex-parte reexamination of independent claim 10 and dependent claim 16 of the 844 patent (the “844Reexam”). EX1005 (844Reexam file history), 3617-18 (4/4/22 Reexam Order at page 2). The examiner issued a non-final office action rejecting claims 10 and 16 as obvious over Lane (EX1006) in view of Ledbetter. EX1005, 3597 (10/12/22 office action at 2). In that office action, the examiner asserted that Lane disclosed the “frame mode” that was found missing from the challenges in the 822IPR. EX1005, 3600-3601 (10/12/22 office action at 5-6). PO responded to that rejection by arguing that Lane did not disclose

the first and second “content mode” limitations required by claim 10 when those limitations are construed as discussed below in Section III.F.2. EX1005, 3489 (12/9/22 response at 15).

73. The examiner then issued a final rejection in which he rejected PO’s arguments and asserted that “content mode” was not limited to a visual representation such as an icon or a bar but rather would be understood as a type or kind of content, that a desktop and icon configuration or a dashboard display such as illustrated in Fig. 13 of the 844 patents satisfied this limitation, and that top level icons were not required. EX1005, 129-134 (1/4/23 final rejection at 7-12). PO responded by arguing that a content mode is a “grouping of information, programs, features and applications” and that displaying a “content mode . . . requires displaying some visual representation that represents the higher level construct.” EX1005, 89 (3/3/23 Response at 4); *see also id.* at 94-116 (3/3/23 Response at 9-31) for PO’s detailed argument, discussed below in Section III.F.2. The examiner accepted PO’s arguments and confirmed the patentability of claims 10 and 16 on that basis. EX1005, 6-7 (3/30/23 NIRC at 2-3).

F. Person of Ordinary Skill in the Art

74. In my opinion a POSITA with regard to the 844 Patent would have had a bachelor’s degree (or equivalent) in electrical engineering, computer engineering, computer science, or a comparable subject and would have had two to

three years of work experience in the design and architecture of laptop computers and other portable electronic devices. Alternatively, a person of ordinary skill in the art would have had an advanced degree (or equivalent) in electrical engineering, computer engineering, computer science, or a comparable subject and would have had one year of post-graduate research or work experience in the design and architecture of laptop computers and other portable electronic devices. A person of ordinary skill in the art would have been familiar the structural hardware aspects of laptop computers and other portable electronic devices as well as designs of user interfaces employed and displayed by computer operating systems and their organization of content and functionality. Similar skills and knowledge could be acquired by other means.

IV. CLAIM CONSTRUCTION UNDER 37 C.F.R. § 42.104(B)(3)

75. I understand that the Challenged Claims are to be interpreted using the same claim construction standard that is used to construe the claim in a civil action in federal district court. I understand that this means that claim terms of a patent are given the ordinary and customary meaning the terms would have to a POSITA, in view of the description provided in the patent itself and the patent's file history.

76. I understand that to determine how a POSITA would understand a claim term, one should look to those sources available that show what a POSITA would have understood the disputed claim language to mean. I understand that, in

construing a claim term, one looks primarily to the intrinsic patent evidence, including the words of the claims themselves, the remainder of the patent, and the patent's prosecution history. I understand that extrinsic evidence, which is evidence external to the patent and the prosecution history, may also be useful in interpreting patent claims.

77. I understand that words or terms should be given their ordinary and accepted meaning unless it appears that the inventors were using them to mean something else. In making this determination, the claims, the remainder of the patent, and the prosecution history are of paramount importance. Additionally, the patent and its prosecution history must be consulted to confirm whether the patentee has acted as its own lexicographer (i.e., provided its own special meaning to any disputed terms), or intentionally disclaimed, disavowed, or surrendered any claim scope.

78. I do not contend that its proposed constructions are complete constructions of these limitations or the claims for any other purpose, including for issues that have been raised in the related litigation. Claim terms not listed below should be construed according to their plain and ordinary meaning to a POSITA.

A. “frame mode” (claims 1, 10, 18)

79. In the 822IPR, the Board preliminarily construed “‘frame mode’ as having the keyboard face down on a surface with the screen face up, and the base

and display components forming a non-zero angle. Frame mode is distinct from ‘tablet mode,’ where the display is flush against the base.” EX1004, 10. For the purposes of this IPR, I adopt this construction.

B. “configured to display to a user on the main display component a [first/second] content mode” (claims 1, 10, 18)

80. In the 844 Ex-parte Reexam, Patent Owner argued for and received a construction of these terms as meaning “displaying some information that represents a higher-level construct into which content is grouped. This recitation is distinct from merely displaying individual things (e.g., applications) that may be grouped into a content mode.” EX1005, 6 (844 Reexam Notice of Intent at 2); see also EX1005, 94-116 (844 Reexam, 3/3/23 Response to Final Office Action at 9-31). For the purposes of this IPR, I adopt this construction.

81. Consistent with PO’s arguments in the reexamination, this construction should be understood to include the higher level constructs shown on the display of Figs. 11-12 and 17 of the 844 patent and to exclude anything shown on the display of Fig. 13 of the 844 patent. EX1005, 99-103 (844 Reexam 3/3/23 Response to Final Office Action at 14-18). In particular, each individual “bar” 172 in Fig. 12 (Apps, 172d; Media 172a, Connect 172b, Web 172c and Channels 172e) is itself a content mode. EX1005,107 (3/3/23 Response to Final Office Action at 22) (e.g., referring to “‘media’ content mode 172a”). Additionally, claim 10 does not require simultaneously displaying first and second content modes. EX1005,

110. Furthermore, “nothing in claim 10 precludes displaying both the first and second content modes in laptop mode and/or displaying both the first and second content modes in easel mode.” EX1005, 111. And finally, nothing in claim 10 requires the first content mode to be “particular to the orientation of laptop mode.” EX1005, 111. In light of these positions taken by PO during the 844 Reexam, if the exact same display of Fig. 12 with all five bars 172 were displayed on the screen with the laptop in the laptop mode and with the laptop in the easel mode, but with different display orientations, the first and second content mode limitations of claims 1, 10 and 18 would be satisfied. For the purposes of this IPR, I adopt this construction.

82. The 844 patent expressly discloses that the particular form of “content mode” is not limited to the bars of Fig. 12 and includes “a ‘desktop’ and icon configuration.” EX1001, 12:11-17; EX1005, 101 (844 3/3/23 Response at 16).

83. “Content mode” and “mode of content” mean the same thing. EX1005, 90, 92, 96 and 99 (3/3/23 Response at 5, 7, 11, and 14); EX1005, 3486, 3488, 3493, 3495 (12/9/22 Response at 12, 14, 19 and 21).

C. “display mode” (claims 1, 10, 18)

84. “Display mode” means “the particular physical configuration of the portable computer.” EX1005, 3480 (12/9/22 844 Reexam Response at 6). Display modes may include laptop, easel, tablet, flat, frame, and closed modes. *Id.* “Display

mode” is a “very different concept than” a “content mode” or “mode of content.”

Id. at 3481. For the purposes of this IPR, I adopt this construction.

D. “navigation control” (claims 1, 10, 18)

85. The 844 patent discloses that “navigation is discussed below primarily with reference to the scroll wheel 132 and navigation buttons 166, 168; however, it is to be appreciated that navigation may also be accomplished using *any of the conventional tools discussed above or known to those of skill in the art.*”

EX1001, 12:17-21 (emphasis added). In district court litigation against HP, Patent Owner alleges that a touchscreen satisfies the “navigation control” limitation as recited by claims 1, 10 and 18 of the 844 patent:

147. The Accused Products (*e.g.*, the EliteBook x360 1030 G3) include a navigation control accessible in each of the plurality of display modes and configured to permit a user to manipulate at least one of operating parameters of the portable computer and the content displayed on the single display screen. For example, the EliteBook x360 1030 G3 includes a touchscreen that is accessible in any mode.

EX1013, ¶147. Accordingly, “navigation control” should be construed broadly to include any conventional tool for navigating, including a touchscreen. For the purposes of this IPR, I adopt this construction.

E. **“the main display component and the base are rotatable with respect to each other about a longitudinal axis . . . to transition between at least the laptop mode and the easel mode” (claim 1)**

“a hinge assembly . . . that defines an axis of rotation about which the both the base and the main display component are rotatable to transition the portable computer between at least the laptop mode and the easel mode” (claim 10)

“the hinge assembly defining a longitudinal axis . . . about which both the display component and the base are rotatable to transition the portable computer between at least the laptop mode and the easel mode” (claim 18)

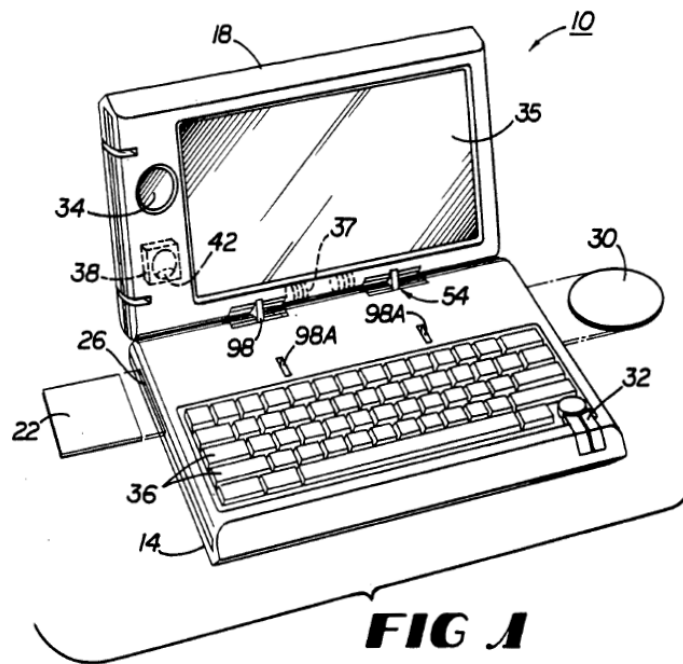
86. These terms may be construed either (1) narrowly as requiring a hinge assembly with only a single axis about which both the base and main display component rotate to transition between the laptop and easel display modes, or (2) more broadly as permitting a hinge assembly with more than one axis, where both the base and main display components are capable of rotating about a single axis for at least part of the transition between laptop and easel display modes, but one or both components may also rotate about one or more additional axes during the transition between laptop and easel display modes. The Board need not resolve this issue as the Petition addresses both constructions and I opine on both.

V. OVERVIEW OF THE PRIOR ART REFERENCES

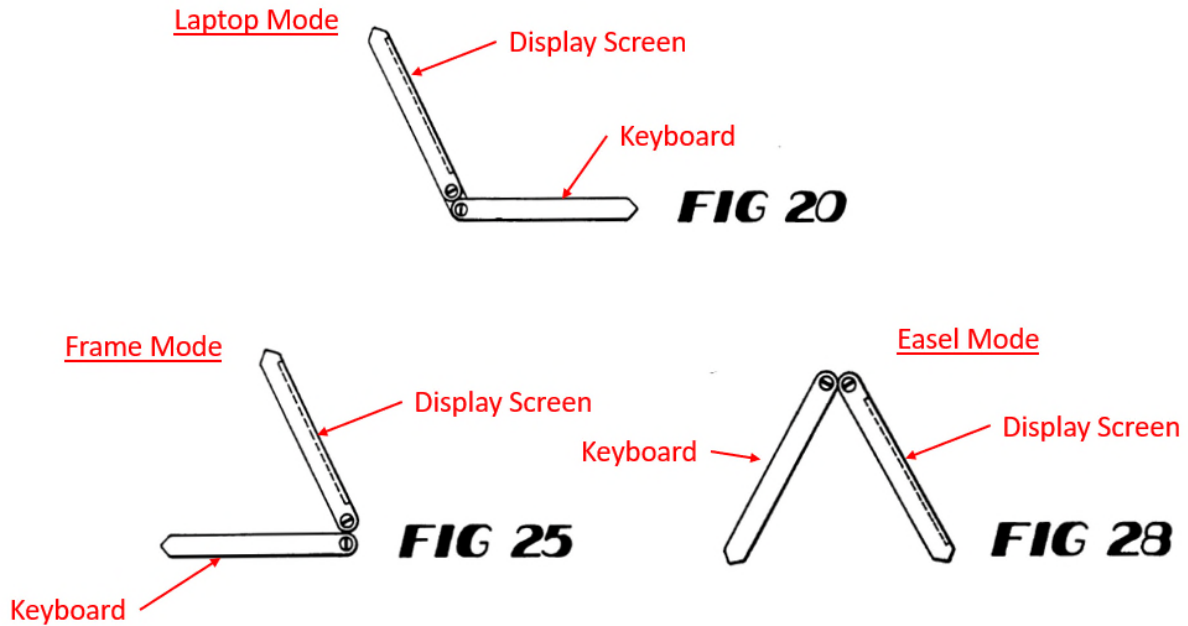
87. I am informed by counsel for Petitioner that each of the references below constitutes prior art to the 844 patent.

A. EX1006 – Lane

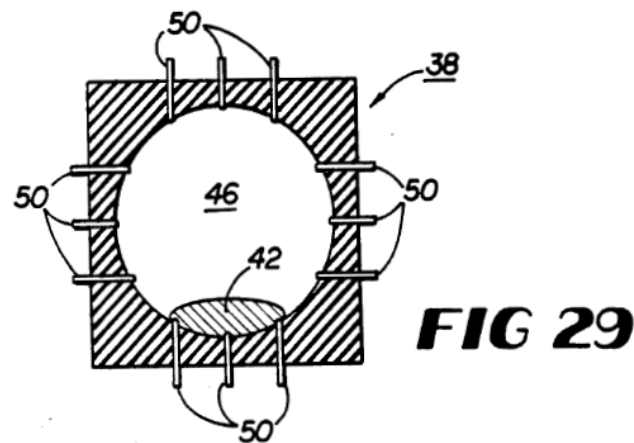
88. Lane discloses a reconfigurable portable computer 10 having a first module 14 (e.g., a keyboard) and a second module 18 (e.g., a display). EX1006, 5:1-22 and Fig. 1.



89. Lane's portable computer 10 can be configured in a variety of display modes, including the laptop mode, easel mode and frame mode as recited in the 844 patent claims as shown in the annotated figures from Lane below:



90. Lane's portable computer 10 includes a position-indicating mechanism 38 (shown as included in the display module 18 in Fig. 1 above) as shown in Fig. 29 that includes a moveable conductor 42 in a spherical cavity 46 that responds to gravitational forces to permit the mechanism to indicate the spatial orientation of a module in which it is included. Lane, 5:23-35.

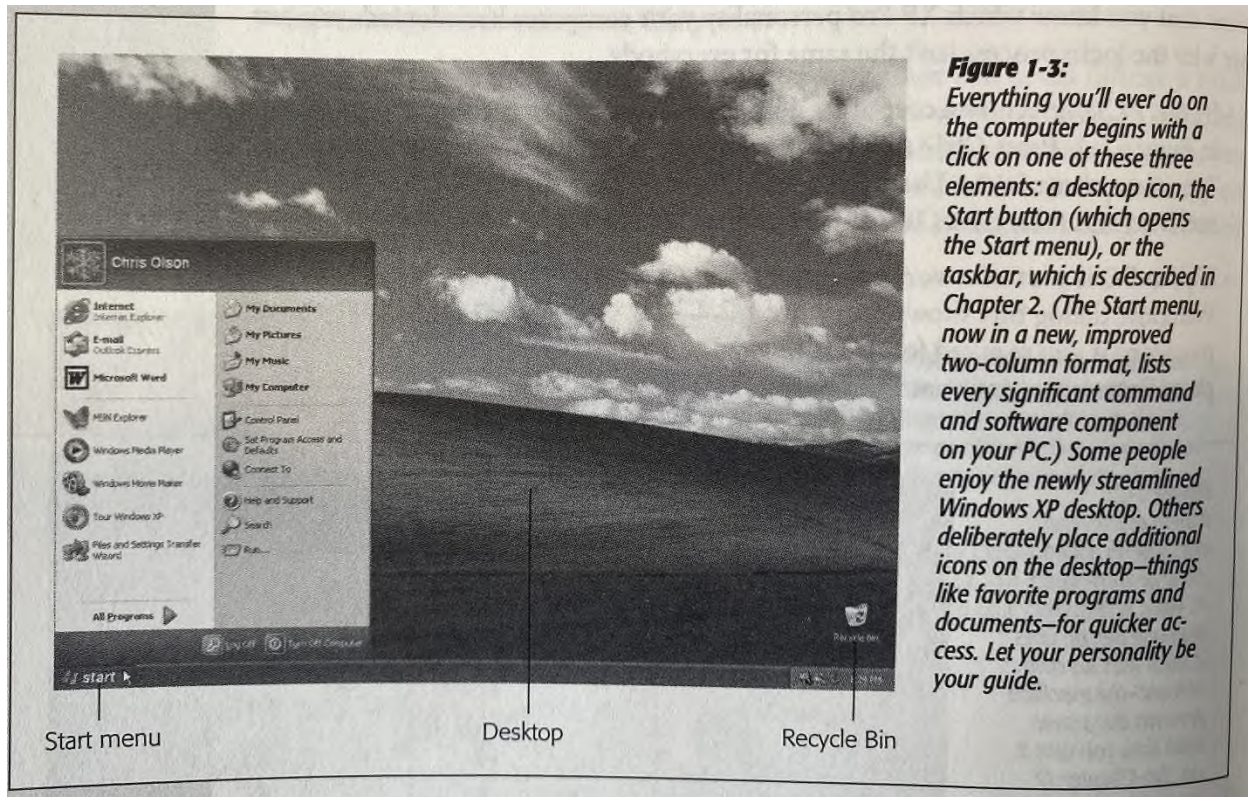


Lane teaches that the mechanism 38 can assist the laptop 10 in determining, e.g., an orientation (portrait, landscape) in which information on the display module 18 should be rendered or whether to render the keys 36 of the keyboard module 14 inoperative when they are not used. Lane, 5:35-6:6.

B. EX1007 - Pogue

91. Pogue is intended to serve as a manual for and summary of existing features of the Microsoft Windows XP Pro operating system. EX1007, 2. This operating system was well-known at the time of the '844 patent and was in widespread use in the U.S. and around the world at this time. The author, David Pogue, was a well-known technology writer and a columnist for the New York Times.

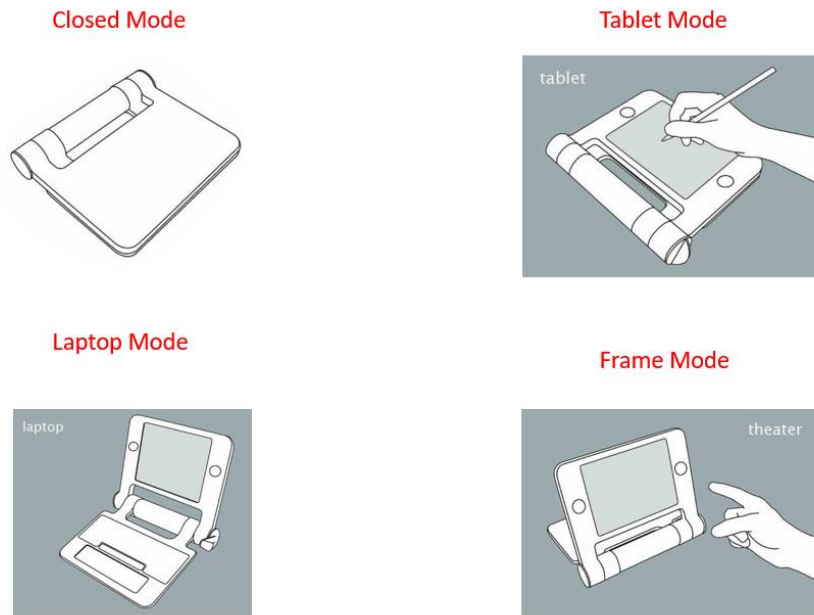
92. The Windows XP Pro operating system includes a graphical user interface that allows users to access applications, documents, and other digital files. "Every application on your machine, as well as every document you create, is represented on the screen by an icon." EX1007, 5. Once a user logs on to Windows XP Pro, the user is presented with the desktop, an example of which is shown in the figure below. EX1007, 22.



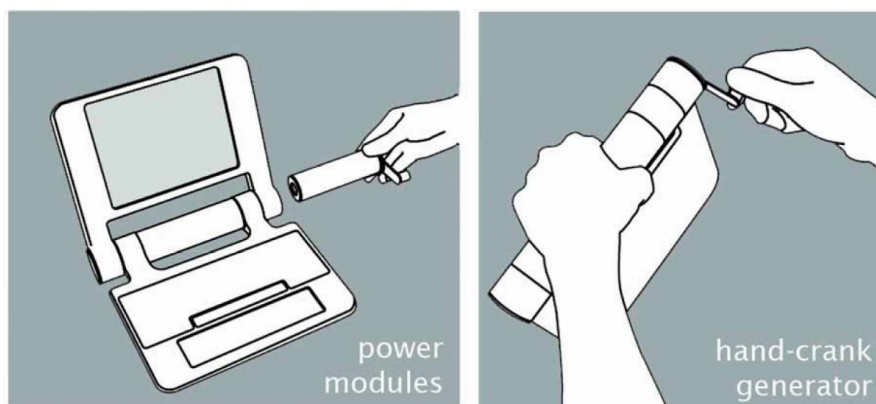
93. Pogue explains that “[e]verything you’ll ever do on the computer begins with a click on one of these three elements: a desktop icon, the Start button (which opens the Start menu) or the taskbar . . .” *Id.* As discussed in Pogue, the default configuration for the XP Pro desktop includes no icons other than the Recycle Bin icon shown above, but the XP Pro operating system gave users the option of changing the default setting to include certain icons including the My Documents and My Network Places icons that appeared on the Desktop in earlier versions of the Windows operating system. EX1007, 22-23. Doing so allowed for for quicker and easier access to the programs, documents or other files represented by those icons. EX1007, 22-23.

C. EX1010 - MIT

94. MIT discloses a laptop computer with a single axis hinge that allows approximately 360 degree rotation, allowing the laptop to be converted from a closed mode to a tablet mode as well as modes between these two extremes, such as the laptop mode and the frame mode (referred to by MIT as the “theater” mode) as shown in the annotated images below:



EX1010, 7-8; see also EX1011, 2. A hand crank generator is located in the hinge assembly to provide power when electricity from a wall socket is not available (EX1010, 9):



See also EX1011, 3.

D. EX1020 – Hotelling

95. Hotelling is directed toward gesturing associated with touch-sensitive devices including touchscreens. EX1020, ¶¶[0004], [0006]. Hotelling explains that a wide variety of input devices for performing operations on a computer system were in existence, including buttons, switches, keyboard, mice, trackballs, touch pads, joy sticks and touch screens, and that these operations generally correspond to moving a cursor and making a selection on a display screen. EX1020, ¶[0006]. These devices can be used in a variety of computer systems, including desktops, laptops, tablets, and hand-held computers. EX1020, ¶[0063]. An exemplary computing device with a display 68 and an input device 70 is shown in Fig. 1:

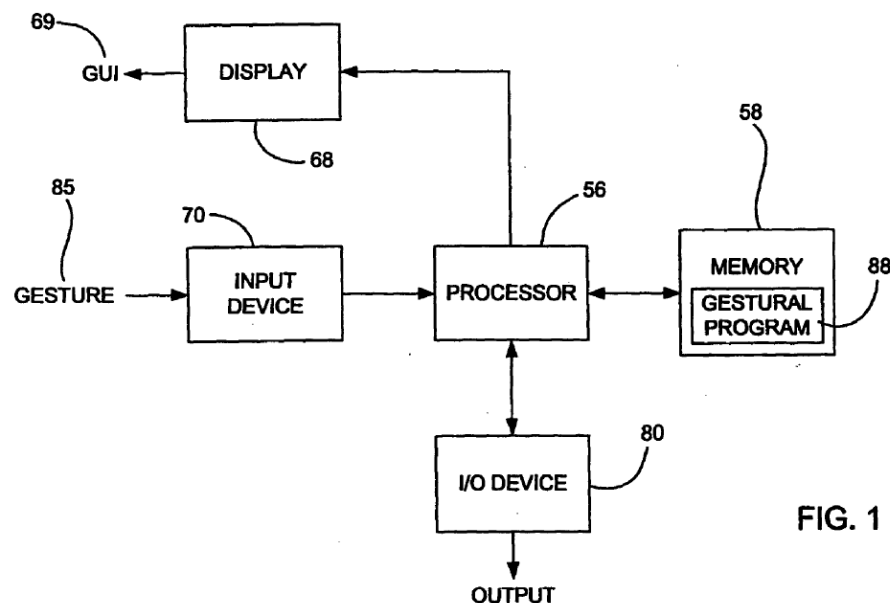


FIG. 1

96. In the computer system above, the input device can be a touchscreen or touch pad that recognizes touches as well as the magnitude and position of the touches, and reports them to the processor 56 which interprets them. EX1020, ¶[0068]. The touch pad or touchscreen can be a single point device which can only recognize a single touch or a multi-point device capable of distinguishing multiple touches. *Id.* The display 68 is configured to display a graphical user interface, or GUI, 69 which can include a wide variety of graphical objects including windows, fields, dialog boxes, menus, icons, buttons, cursors and scroll bars. *Id.* The user can select an object such as an icon using the input device. *Id.*

97. Hotelling contrasts the use of touch pads and touchscreens as the input device for a computer such as a laptop. With touch pads, the movement of the input pointer corresponds to the relative movements of the user's finger or stylus as

the finger or stylus is moved along a surface of the touch pad. EX1020, ¶[0009]. Hotelling explains that a touchscreen offers advantages over a touchpad. With a touch screen, the user can make a selection on the display by simply placing a finger over the GUI objects on the screen. EX1020, ¶¶[0009], [0069]. In contrast, with touchpads there is no such one-to-one relationship: the display is typically located in a vertical plane while the touchpad is typically located in a horizontal plane, which makes the use of a touch pad more difficult when compared to touchscreens. EX1020, ¶[0069].

E. EX1012 – Segawa

98. Segawa discloses a “folding type portable terminal” such as a PDA or mobile phone, with a first housing (also referred to as a shell) 2 having a main display 5a pivotally connected via a hinge mechanism 3 to a second housing/shell 1 with a plurality of dial keys 6 as shown in Figs. 2A and 3A below. EX1012, Title, ¶[0003], [0009].

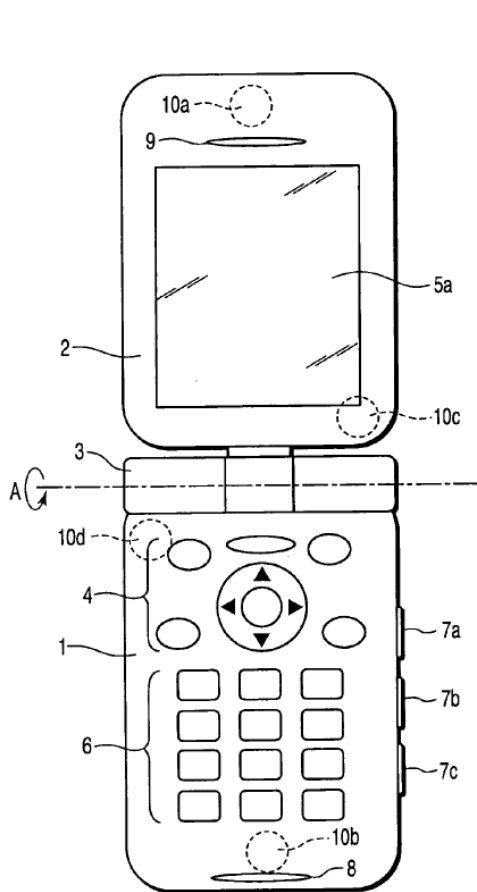


FIG. 2A

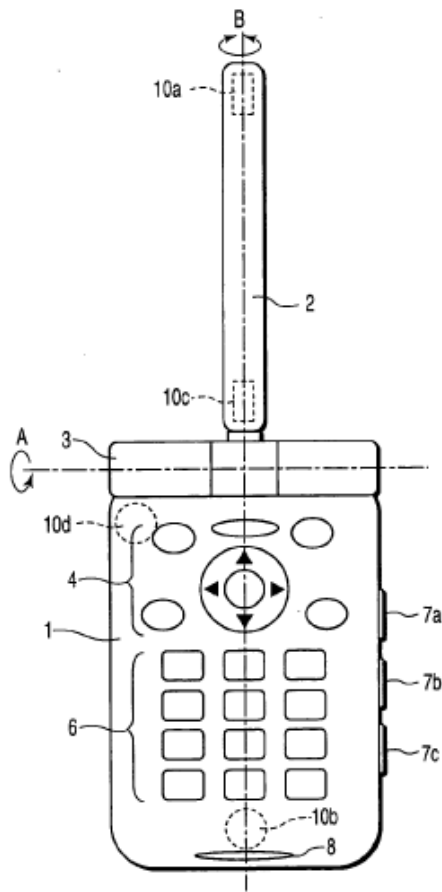


FIG. 3A

99. The portable terminal includes a TV tuner that receives a TV signal that can be displayed on the main display 5a. EX1012, ¶[0040]. Activation of the TV function on the main display 5a can be accomplished in an automatic mode and a manual mode. EX1012, ¶[0045]. In the automatic mode, the TV function is automatically activated and TV programs are displayed on the display 5a depending on the relative positions of shells 1, 2 with respect to each other as determined by sensors 10a-d within the shells. For example, the TV mode is automatically activated and displayed on the display 5 in the full screen mode

when the shells 1, 2 are opened to the 360 degree position shown in Figs. 5A and 5B below, with the display screen 5 of the first shell 2 facing outward and the back of the first shell 2 covering the dial keys 6 of the second shell 1:

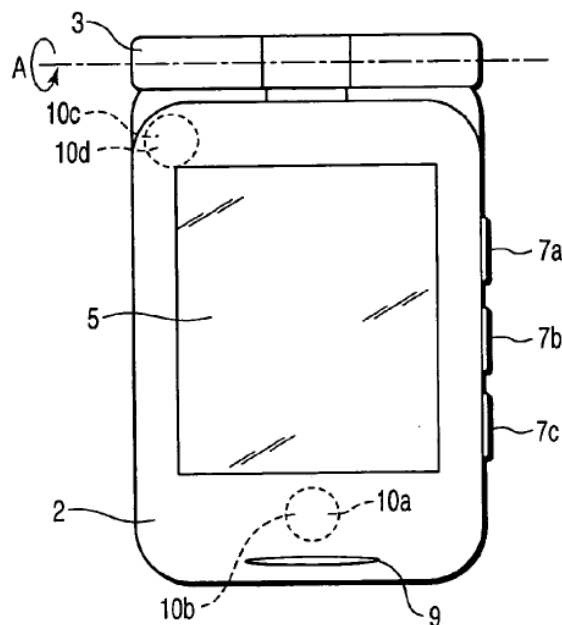


FIG. 5A

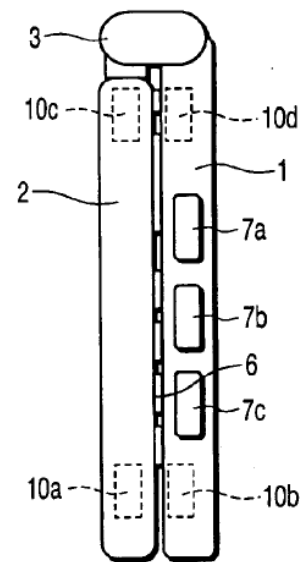


FIG. 5B

EX1012, ¶¶[0053]-[0054]; Figs. 5A, 5B and 7.

100. In addition to the automatic mode which controls the content of the display 5a in accordance with the relative positions of the shells 1, 2, Segawa also discloses a manual mode that allows the user to cause activation of the TV mode and the display of TV content on the display 5a even if the shells 1, 2 are the position shown in Fig. 2A (referred to in Segawa as the third state – EX1012, ¶[0060]). Segawa discloses that the user can activate the TV mode with the display

5 in a partial screen mode with the shells 1, 2 in the third state via a menu selection. EX1012, ¶¶[0061]-[0062].

VI. GROUND 1: CLAIMS 1, 3, 4, 7-10, 13, 14, 16, 18 AND 22 ARE OBVIOUS OVER THE COMBINATION OF LANE AND POGUE

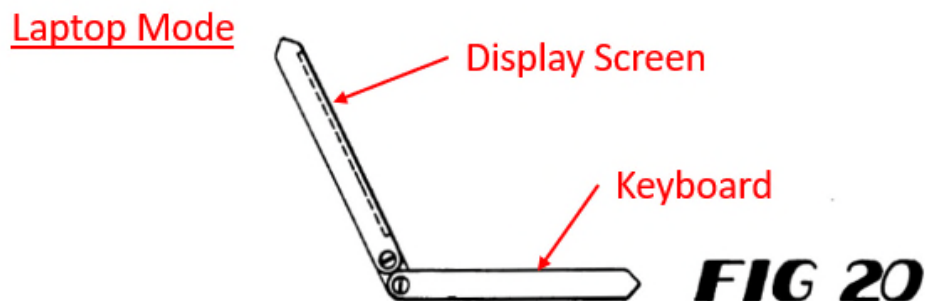
101. Claims 1, 3, 4, 7-10, 13, 14, 16, 18 and 22 are unpatentable as obvious over Lane in view of Pogue as demonstrated below. A POSITA would have found it obvious to combine Lane and Pogue because Lane is directed toward a portable computer but does not specify an operating system. A POSITA would have understood that an operating system is an expected component to operate a pen-based or laptop computer such as those disclosed in Lane, and would have found it obvious to include an operating system in Lane's computer. E.g., EX1006 at 3:5-14; 7:30-8:23. Lane also discloses that his device has associated software. Ex, 1006 at 5:36. A POSITA would have been motivated to select a Windows operating system due to market forces because, prior to and at the time of the claimed 2008 priority date of the 844 patent, Windows was the most widely used operating system for personal computers including portable personal computers such as laptop computers, and the Windows XP Pro version of that operating system as described in Pogue (EX1007) was in widespread use. A POSITA would have had a reasonable expectation of success in making this combination as Windows XP Pro was widely used and explicitly specified minimum and recommended hardware requirements. EX1007, 632. A POSITA would have been motivated to configure

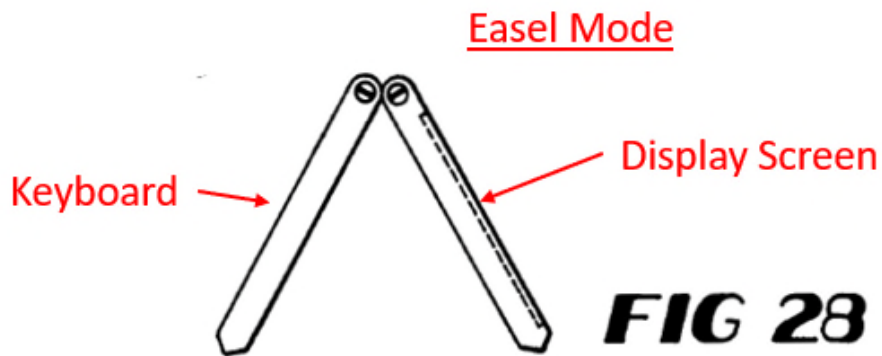
Lane's laptop to satisfy these requirements because the ability to run Windows operating systems would have been viewed as necessary for commercial acceptance of such a portable computer. Lane's computer running the XP Pro operating system as taught in Pogue discloses and/or renders obvious each of the claims challenged in this Ground 1 as I explain in detail below.

A. Claims 1, 10 and 18

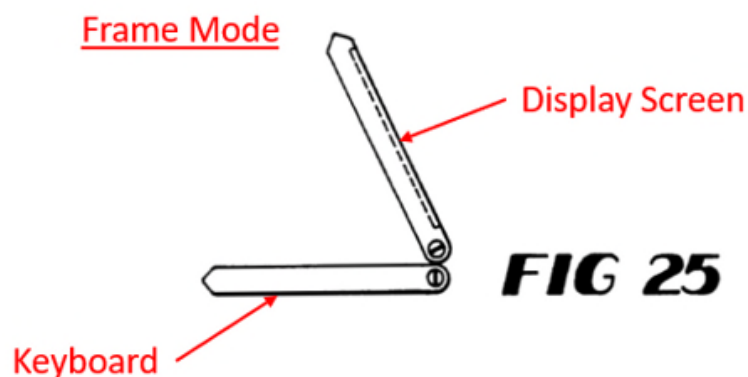
1. [1pre], [10pre], [18pre] **A portable computer configurable between a plurality of display modes including a laptop mode and an easel mode wherein transitions between the plurality of display modes allows an operator to interact with a single display screen in each of the plurality of display modes, the portable computer comprising:**

102. To the extent that the preamble is limiting, Lane discloses it and/or renders it obvious. Lane discloses a portable computer 10 that is configurable between a plurality of display modes, including a laptop mode and an easel mode as shown in the annotated versions of Figures 20 and 28 below:

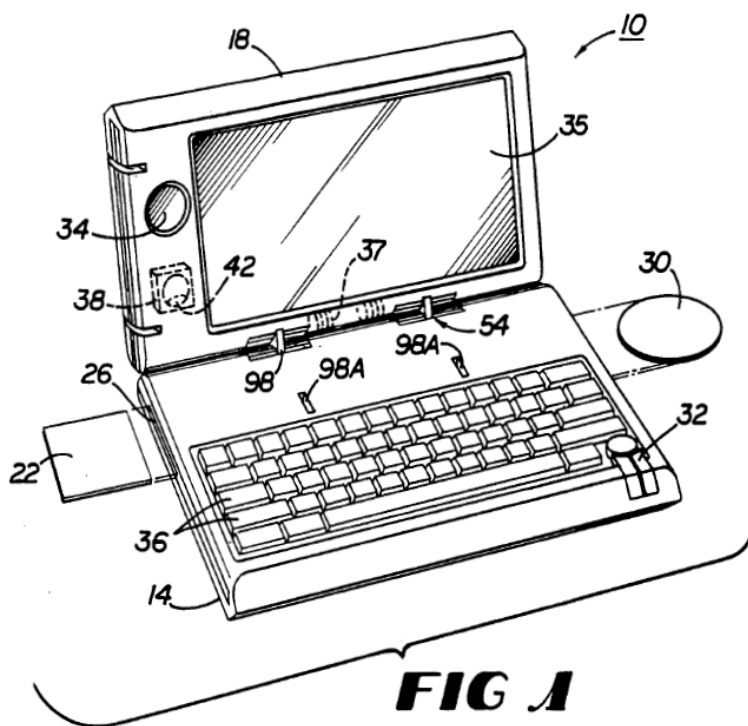




EX1006, 10:10-31; *see also* 5:1-22, 8:2-15, and Figs. 1, 6 and 8. Lane further discloses the use of one or more torque generating devices 37, such as a spring, to maintain the position of the second module 18 relative to the first module 14 when the portable computer 10 is in use. Lane, 5:19-22. To the extent that the plurality of modes further includes a frame mode, Lane discloses a frame mode in Fig. 25 (annotations added); *see also* limitations [1h], [10h] and [18h].



103. Lane's portable computer 10 includes a single display screen 35 in the display module 18:

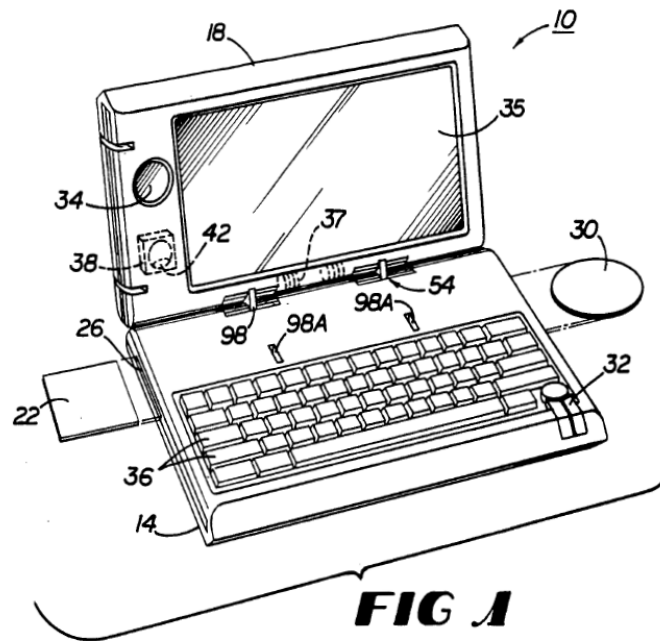


EX1006, 5:1-15; *see also* 2:33-3:1. A user is able to interact with Lane's display screen 35 in each of the laptop and easel modes (as well as the frame mode and other modes) because Lane discloses that display 35 can be used for pen-based computing. EX1006 at 3:5-14, 8:15-19; 10:10-31. A POSITA would have understood this to mean display 35 is a touchscreen or equivalent. Alternatively, it would have been obvious to a POSITA to use a touchscreen for enabling pen-based computing as disclosed by Shimano. EX1008, 1:25-53 and 3:66-4:18. A POSITA would have understood, or at least have found obvious, that the touchscreen and

pen-based computing would be operable in all configurations of the computer 10, including the laptop, easel and frame modes, because the use of a touchscreen rather than a keyboard for not only handwriting but also other user-computer interactions such as icon and menu selection operations was well-known at the time of the 844 priority application even for portable computers that have a keyboard. EX1015 (Kurtenbach), 2:41-64 (discussing display interactions on screen of personal/portable computers with keyboards and touchscreen displays), 2:65-4:5 and Figs. 1-4 (discussing menu selections via display screen on such computers). A POSITA would have had a reasonable expectation of success in so doing because enabling the touchscreen and pen-based computing in all configurations of the computer 10 was a simple design choice that involved no more than ordinary skill in the art.

2. [1a], [10a], [18a] a base including a keyboard;

104. Lane discloses this limitation. Lane discloses a portable computer 10 with a first module 14 that constitutes a base and includes a keyboard with keys 36. EX1006, 5:4-6.



3. [1b] a main display component rotatably coupled to the base “”

[10b] a main display component rotatably coupled to the base and including the single display screen which displays content;

[18b] a main display component including the single display screen configured to display content;

105. Lane discloses and/or renders obvious this limitation. Lane discloses a portable computer 10 with a second module 18 that includes a single display screen 35. EX1006, 5:1-15; 2:33-3:1 and Figs. 1, 5-9. The second module 18 is therefore a main display component. The main display component/second module 18 is rotatably coupled to the first module 14 (the base) via connectors 54. EX1006, 6:7-12. The connectors 54 allow the first and second modules 14, 18 to rotate with

respect to each other as shown in Figs. 5-9. EX1006, 7:30-8:23; *see also* Figs. 19-21, 25 and 27-28, and my analysis for limitations [1c], [10c] and [18c] below. The single display can display information to the user. EX1006 5:35-6:6

4. **[1c] such that the main display component and the base are rotatable with respect to one another about a longitudinal axis running along an interface between the main display component and the base to transition between at least the laptop mode and the easel mode, the main display component including the single display screen,**

[10c] a hinge assembly disposed at least partially within the base and the main display component that defines an axis of rotation about which both the base and the main display component are rotatable to transition the portable computer between at least the laptop mode and the easel mode,

[18c] a hinge assembly disposed at least partially within the base configured to rotatably couple the main display component to the base, the hinge assembly defining a longitudinal axis running along an interface between the display component and the base about which the display component and the base are rotatable to transition the portable computer between at least the laptop mode and the easel mode,

106. Lane discloses and/or renders obvious these limitations. Lane discloses a hinge assembly including two connectors 54 that can be permanently attached to the second (display) module 18 and that clamp onto an axle 102 located in the first (base) module 14 as illustrated in Figs. 3 and 4. Lane, 6:25-36.

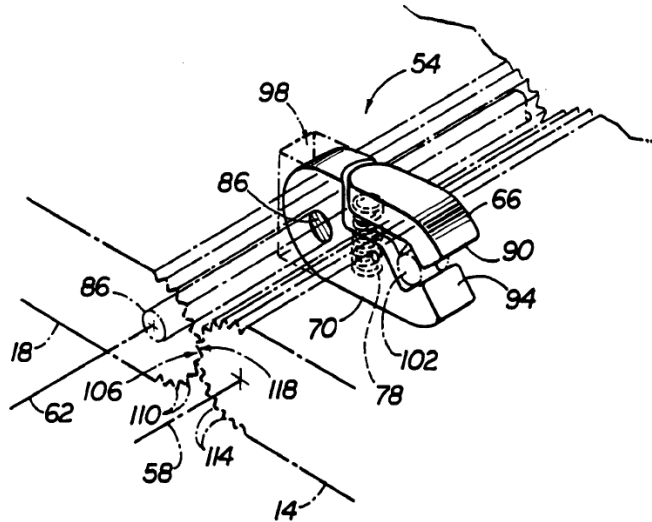


FIG 3

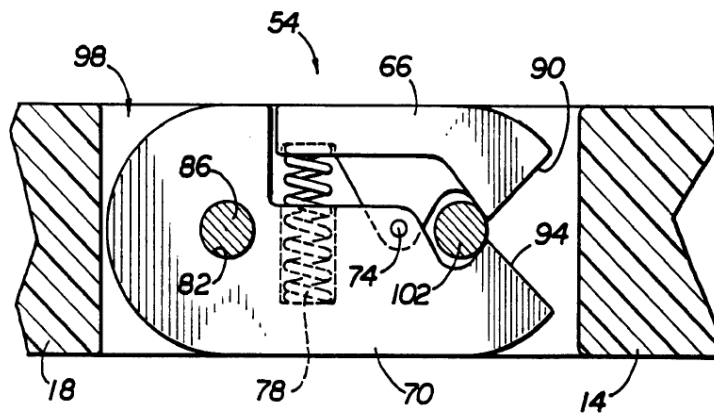
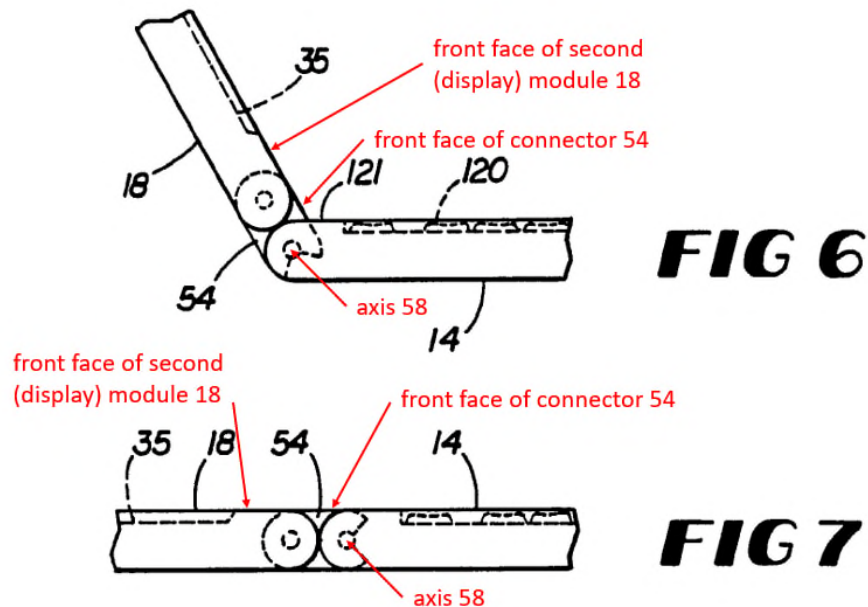


FIG 4

The hinge assembly couples the first module 14 (the base) and second module 18 (the display component) together. The connectors 54 of the hinge assembly extend partially into the first (base) module 14 as shown in Figs. 3 and 4, and the axle 102 is located in the first (base) module 14. The hinge assembly couples the first (base) module 14 and second (display) module 18 together. Lane, 6:32-7:2.

107. The axle 102 defines an axis of rotation 58 (see Fig. 3 above) that constitutes the claimed “longitudinal axis.” The axle 102/axis of rotation 58 runs along the interface of the first and second modules 14, 18 and about which second (display) module 18 may rotate. This can be seen by comparing the annotated versions of Figs. 6 and 7 below.



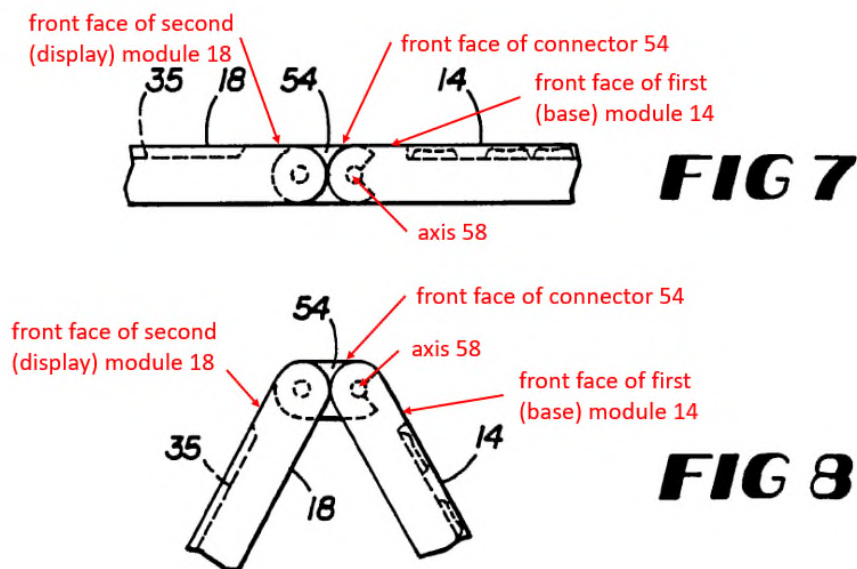
In both figures, the front face of the connectors 54 are parallel to the front face of the second (display) module 18. In Fig. 6 (depicting the laptop mode), the second (display) module 18 as well as the connectors 54 are at an angle between 90 degrees and 180 degrees with respect to the first (base) module. In contrast, the second (display) module 18 and the connectors 54 are at an angle of 180 degrees with respect to the first (base) module in Fig. 7. This indicates that, as between Figs. 6 and 7, the second (display) module 18 and the connectors 54 have rotated

about the axis 102 defined by the axis 102 in the first (base) module. That the second (display) module 18 is not rotating about the axis 58 and not the axis 62 defined by axle 86 (see Fig. 3 above) is consistent with Lane's claim 4, which recites "means for hindering the second electronic module from rotating about the second axis of rotation."

108. Moreover, the teeth 110, 114 shown on the first and second modules in Fig. 3 above do not preclude such rotation of the second module 18 about the axis 58 in the first module 14 for at least two reasons. First, the teeth 110, 118 are optional. EX1006, 7:3-7 ("second module 18 *may* also include teeth 110 . . . ***If present***, teeth 110 and 114 . . .") (emphasis added).² Second, the connectors 54 allow the first and second modules 14, 18 to be separated, and thus would allow those modules to be pulled apart a slight distance to separate the teeth 110, 114 to allow such rotation of the second module 18 about the axis 58. Lane, 6:26-36 (explaining that connector 54 of Fig. 4 includes a moveable leg 66 that pivots a about a pin 74 to allow the connector 54 to detach from axle 102) and 10:32-11:16 (discussing detachability of modules 14 and 18).

² In embodiments without teeth, Lane discloses the use of two torque generating devices 37, such as springs, that work (together with friction) to maintain the portable computer in any of the configurations shown therein, including the laptop, easel and frame modes. Lane, 5:19-22 and 7:6-12.

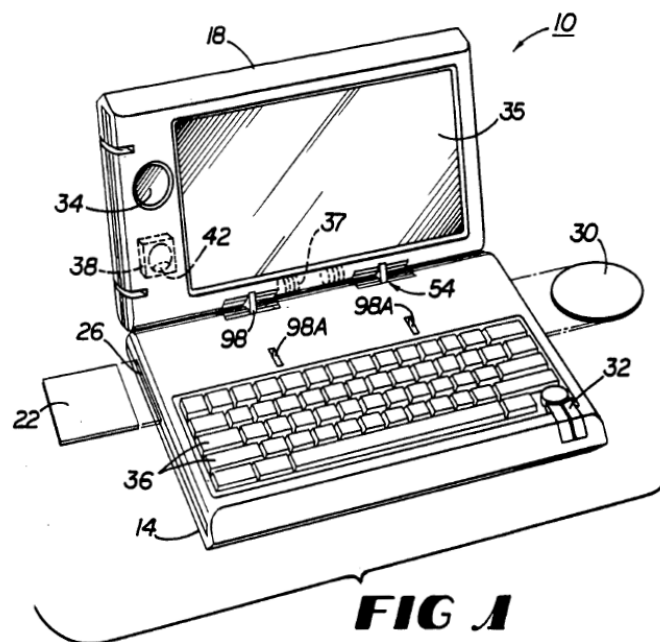
109. The first (base) module 14 also (in addition to the second module 18 as I discuss above) rotates about the axis 58 defined by the axle 102 in the first (base) module 14. This can be seen by comparison of the annotated versions of Figs. 7 and 8 below. In Fig. 7, the front faces of both the first and second modules 14, 18 are parallel to the horizontal front face of connector 54. In Fig. 8, which depicts the easel mode, both the front faces of both the first and second modules 14, 18 are rotated downward with respect to the horizontal front face of connector 54. This indicates that, as between Figs. 7 and 8, the first (base) module 14 has rotated about the axis 58 defined by the axle 102 in first module 14.



Thus, as Lane's portable computer 10 transitions from the laptop mode of Fig. 6 through the mode of Fig. 7 to the easel mode of Fig. 8, both the second (display) module 18 and the first (base) module 14 rotate about the axis 58 defined by the axle 102 in the first (base) module 14. That the second (display) module 18 also

rotates about a second axis 62 defined by axle 86 in that module does not preclude an unpatentability determination because the challenged claims are not limited to a single axis of rotation as I discuss above in Section IV.E.

110. ***With respect to limitation [1c]***, Lane's second module 18/main display component includes a single display screen 35 as shown in Fig. 1:



5. **[1d], [10d], [18d] wherein the transition between the laptop mode and the easel mode allows the operator to operate the portable computer while viewing the single display screen in each of the plurality of display modes, wherein**

111. Lane discloses and/or renders obvious this limitation. As I discuss above for limitations [1pre], [10pre] and [18pre], Lane discloses and/or renders obvious that display screen 35 is a touchscreen. As shown in Figs. 6 and 8 above, the display/touchscreen 35 is accessible and viewable by the user in both the laptop

(Fig. 6) and easel (Fig. 8) modes as well as the frame mode (Fig. 25). As I discuss above for limitations [1pre], [10pre] and [18pre], a POSITA would have understood or found obvious that the touchscreen was active for user interactions in each of the plurality of display modes including the laptop, easel and frame modes. Thus, transitioning Lane's portable computer 10 from the laptop mode to the easel mode allows the user/operator to operate the portable computer 10, i.e., by pressing the touchscreen, during that transition. The user can also operate the portable computer 10 during a transition to frame mode.

6. **[1e], [10e], [18e] the laptop mode is configured to display to a user on the main display component a first content mode having a first content display orientation with the main display component oriented towards the user and the keyboard oriented to receive input from the user;**

112. Lane discloses a laptop mode as I discuss above for limitations [1pre], [10pre] and [18pre], but is silent as to what content is displayed on the display/touchscreen 35 when in this configuration and therefore does not disclose the display of first or second content modes. However, Pogue discloses the display of first and second content modes as those terms are construed above. Pogue discloses a "My Documents" folder icon that a user may choose to add to the desktop that constitutes a first content mode. EX1007 at 23, 264, and 625 (illustrating desktop with My Documents folder icon visible in upper left hand corner):



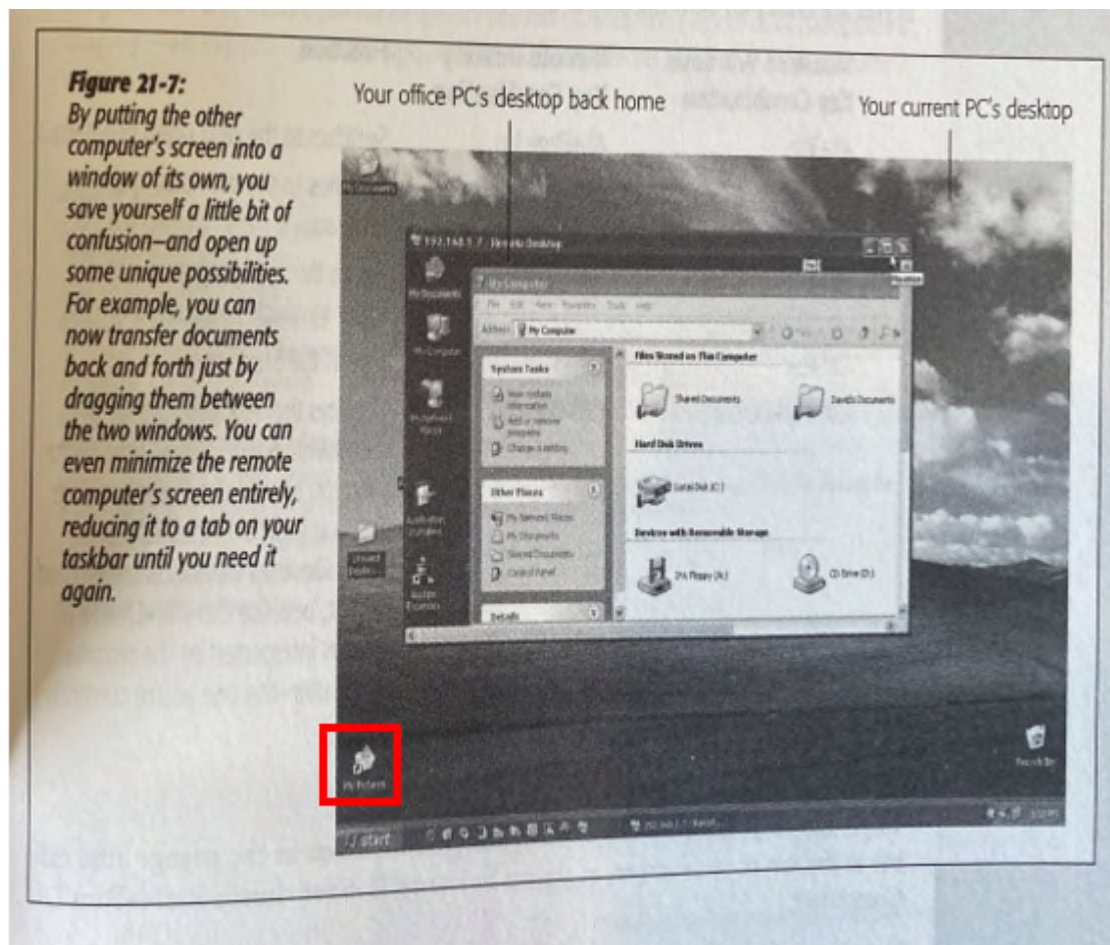
Pogue further discloses that some users prefer the classic Windows desktop and that Windows XP can be configured to default to the classic desktop with the display of the “My Documents” folder icon. EX1007, 25. Clicking the “My Documents” folder icon on the desktop results in a display of documents, each of which can be clicked on to open in an appropriate application such as Microsoft Word. EX1007, 32 (showing My Documents icon selected and window with list of documents in My Documents folder), 112 and 152 (discussing opening an item in a folder by double-clicking on it).

113. Displaying the “My Documents” icon on the classic desktop as disclosed in Pogue constitutes “displaying some information that represents a higher-level construct into which content is grouped” pursuant to the construction of the content mode term I discuss above in Section IV.B. Thus, the display of the “My Documents” folder icon on the desktop of Windows XP constitutes the display of a first content mode. Because Pogue discloses setting the classic desktop as the default desktop, Pogue also discloses the display of the classic desktop and the “My Documents” folder icon in the laptop mode. In the laptop mode, the desktop and “My Documents” icon will be displayed in a first content display orientation. A POSITA would have understood that this orientation would be such that the top of the content depicted on the display 35 would be opposite the side of the display 35 closest to the connectors 54 and axis 58.

7. **[1f], [10f], [18f] the easel mode is configured to display to the user on the main display component a second content mode having a second content display orientation with the main display component oriented towards the user and the keyboard oriented away from the user, wherein the first and second content display orientations are 180 degrees relative to each other, and wherein the portable computer is operable in the easel mode to enable the user to interact with displayed content without interacting with the keyboard; and**

114. Lane discloses the easel mode. See limitations [1pre], [10pre] and [18pre] above. With respect to the second content mode, see limitations [1f], [10f], [18f] above. Pogue discloses a second content mode in the form of a “My Pictures”

folder shortcut icon. EX1007 at 55 (discussing My Pictures folder) and 625 (showing My Pictures shortcut icon in lower left-hand corner of desktop):

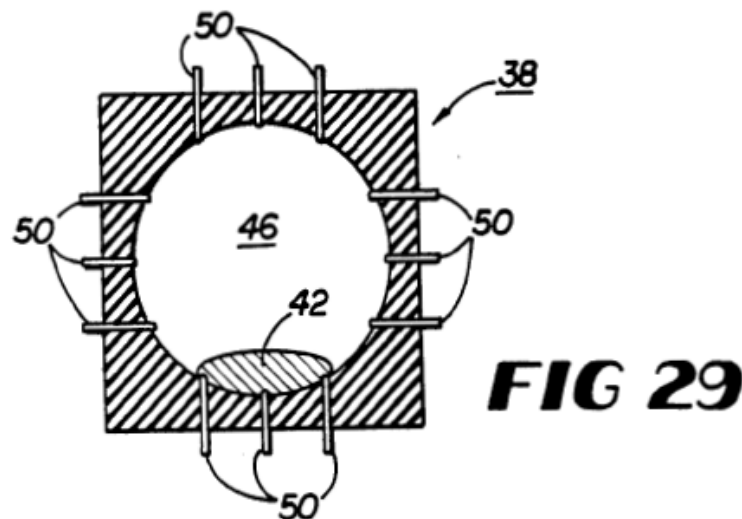


See also EX1007 at 130-131 (discussing creating shortcut icon on desktop).

Alternatively, Pogue discloses a second content mode in the form of a “My Network Places” folder icon. EX1007, 23. Like the My Documents folder of the first content mode, the display of the My Network Places folder icon on the desktop could be manually enabled (*id.* at 23) or enabled automatically as a result of selecting the classic start menu (*id.* at 23). The My Network Places icon allowed

a user to navigate to content in folders on other computers connected to the network to which the user's computer was connected. EX1007, 53 and 579-83.

115. A POSITA would have found it obvious to configure Lane's portable computer 10, when in the easel mode, to display Pogue's classic desktop with the "My Photos" icon and/or the "My Network Places" icon in the display 35 such that the top of the desktop is on the side of the display 35 nearest to the connectors 54 (i.e., in an orientation rotated 180 degrees with respect to the display of the desktop in the laptop mode). A POSITA would recognize that Lane's position indicating mechanism 38 includes 4 sets of conductors 50 as shown in Fig. 4:



EX1005, 5:32-6:6. A POSITA would further have recognized that these four sets of conductors 50, spaced around the periphery of the mechanism 38, would allow the position indicating mechanism 38 to determine, at a minimum, orientations of 0, 90, 180 and 270 degrees relative to gravity.

116. Lane explicitly discloses using the position indicating mechanism 38 to change the orientation of the display from landscape to portrait, which constitutes rotating the display by either 90 or 270 degrees. EX1006, 5:37-6:3. While Lane does not explicitly disclose rotating the display by 180 degrees, a POSITA would have found it obvious to do so as a POSITA would have been motivated to make the display more convenient for the user to view in the easel mode of Figs. 8 and 28, particularly since the position indicating mechanism provides the ability for the portable computer 10 to recognize when the second module 10 is in the inverted (i.e., 180° opposite) vs. normal position with respect to gravity.

117. To the extent that rotating the display by 180 degrees when transitioning between the laptop and easel modes would not have been obvious in view of Lane and the knowledge of a POSITA, a POSITA would have found it obvious to do so in view of disclosures in prior art documents including (1) the disclosure in a patent granted to Wehrenberg of detecting a change in an orientation of a laptop or tablet based on information from an accelerometer and adjusting an orientation of a document displayed on the device such that the orientation of the document is relatively identical to its previous orientation before the device's orientation was changed (EX1009, ¶[0067] and Fig. 4), and (2) the disclosure in a patent granted to Välikangas that a laptop display needs to be

inverted when laptop is in the 844 patent's easel mode (EX1016, 1, 5, Figs. 1 and 4A).

118. It would have been obvious to a POSITA to configure Lane's portable computer so that the touchscreen 35 on the second module 14 is operable for user-computer interactions in all configurations/display modes, including the easel mode, for the reasons I discuss above. See limitations [1pre], [10pre] and [18pre].

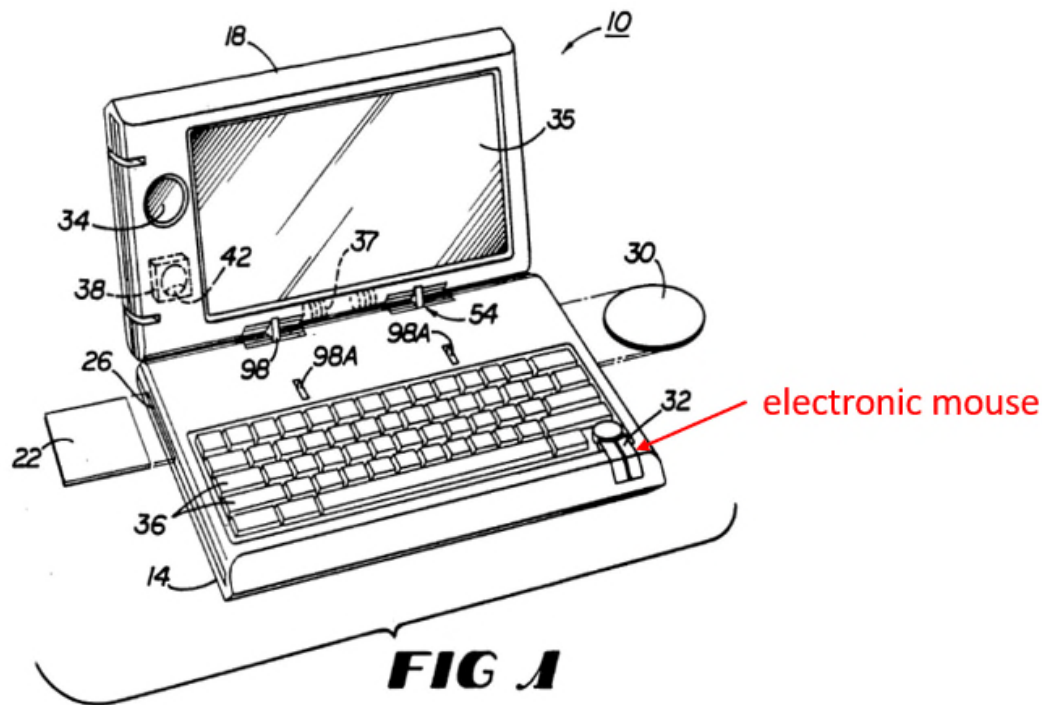
8. **[1g] a navigation control disposed at least partially within the base and rotatable about the longitudinal axis, the navigation control configured to permit a user to control at least one of operating parameters of the portable computer and content displayed on the single display screen**

[10g] a navigation control accessible in each of the plurality of display modes and configured to permit a user to manipulate at least one of operating parameters of the portable computer and the content displayed on the single display screen

[18.g] a navigation control disposed at least partially about the longitudinal axis

119. The combination of Lane and Pogue render these limitations obvious. To the extent that [1g] and [18g] do not require the navigation control to be "accessible in *each* of the plurality of display modes" as recited in [10g] (emphasis added), the combination of Lane and Pogue render obvious an electronic mouse which constitutes a "navigation control" as required by limitations [1g] and [18g]. Additionally, the combination of Lane and Pogue render obvious a touchscreen, which constitutes a "navigation control" as required by limitations [10g] and [18g].

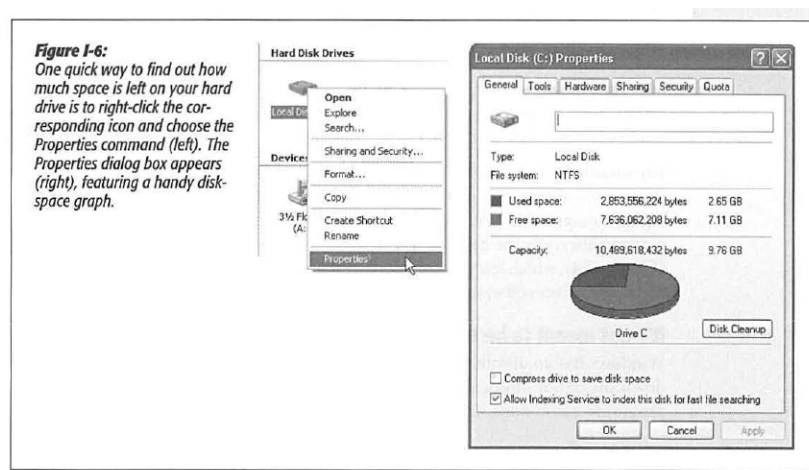
120. **Electronic Mouse ([1g], [18g]):** Lane discloses “an electronic mouse 32 adapted to convert manual pressure to electronic signals capable of moving a cursor about the visual display 35 provided by the second module 18” that is disposed in the first module 14 (the base). Lane at 5:10-15 and Fig 1; *see also* limitations [1pre], [10pre] and [18pre] above.



Shown in Fig. 1 as part of electronic mouse 32, below the pressure pad used to move the cursor, are two buttons which a POSITA would have recognized as the left and right buttons for the electronic mouse 32 by which a user can right click or left click on a graphic item such as an icon. Lane does not explicitly disclose use of the electronic mouse 32 by a user to “control at least one of operating parameters

of the portable computer and content displayed on the single display screen.”

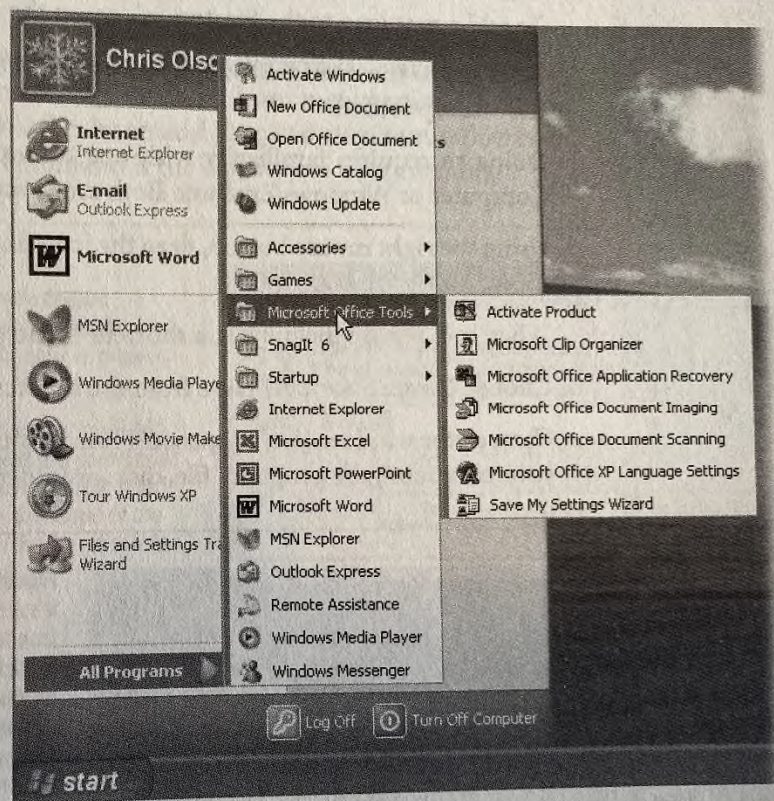
However, Pogue discloses the use of a mouse to control operating parameters of the portable computer. For example, Pogue discloses that adjusting the settings of a particular element of the computer, such as the hard drive, can be accomplished using the mouse by right-clicking on the corresponding icon, which causes a dialog box to appear as shown in Figure I-6, with a setting that can be clicked on to control parameters such as compressing the drive or allowing an indexing service to index the drive for fast search. Pogue at 9-10.



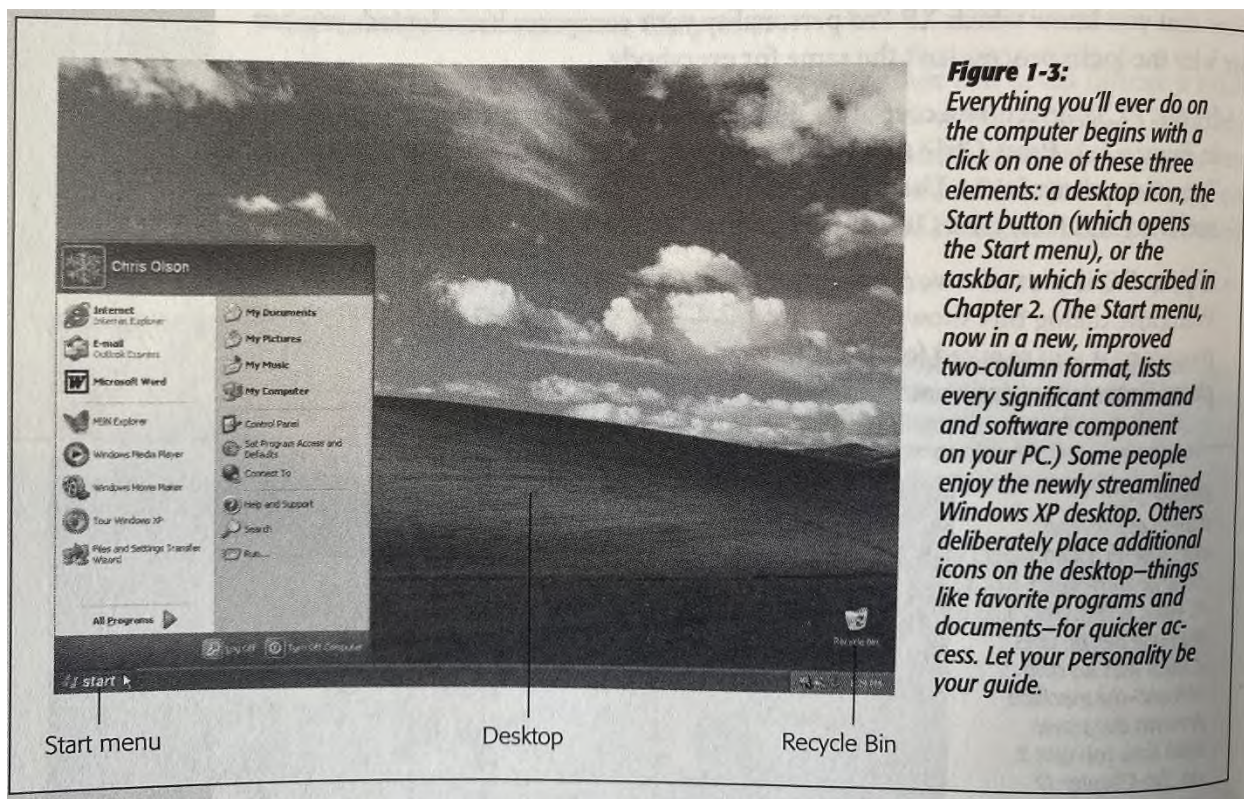
121. Pogue also discloses the use of a mouse to control content displayed on a display screen. For example, Pogue discloses using a mouse to launch applications from the “Start” menu by using a mouse to click on “All Programs” option and then navigating to a desired program such as Microsoft Excel or Microsoft Word. Pogue at 31 and Fig. I-7.

Figure 1-7:

The Start→All Programs menu may list the actual application (such as Microsoft Word) that you can click to launch the program. But it may also list a program group, a submenu that lists everything in a particular application folder. Some software programs install a folder on the All Programs menu, like the Office Tools folder shown here, that contains commands for launching the software, uninstalling the software, running specific utilities, opening the help files, and so on.



122. Pogue further discloses that the left mouse button can be used to click buttons, highlight text, and drag things around the screen, and that the right mouse button can be clicked on to, e.g., open a shortcut button. Pogue at 31 and Fig. I-7.



123. With respect to [18g], the electronic mouse 32 is part of the base and is therefore disposed about the longitudinal axis defined by axis of rotation 58 as are all portions of the base that are spaced apart from the longitudinal axis/axis of rotation 58 (see limitation [18c]).

124. **Touchscreen ([10g], [18g]):** Lane discloses or at least renders obvious that the display 35 in the second module 18 is a touchscreen. See limitations [1pre], [10pre] and [18pre] above. As I discuss above, it would have been obvious that the touchscreen and pen-based computing would be operable in all configurations of the computer 10, including the laptop, easel and frame modes.

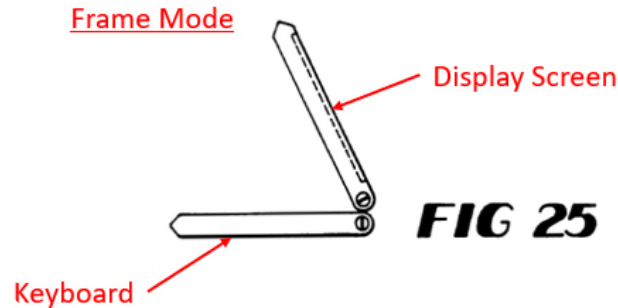
Id. A touchscreen satisfies the “navigation control” limitations [1g] and [10g] for the reasons I discuss in Section IV.D.

125. With respect to [10g]’s “accessible in each of the plurality of display modes” requirement, the touchscreen/display 35 is accessible to a user in each of the display modes including the laptop mode, the easel mode and the frame mode. *See, e.g.*, EX1006 at 10:10-31, Figs. 6, 8, 20, 25 and 28 and limitations [1pre], [10pre] and [18pre].

126. With respect to [18g], the touchscreen/display 35 is part of the main display component which in its entirety is disposed and rotatable about the longitudinal axis defined by axis of rotation 58 (*see* limitations [18b] and [18c]).

9. **[1h], [10h], [18h] wherein the plurality of modes includes a frame mode in which the main display component is oriented towards the operator, the base contacts a substantially horizontal surface, and the keyboard faces the substantially horizontal surface.**

127. Lane discloses a frame mode as shown in Fig. 25 below (annotations added):



In this mode, the display screen of the second module 15 is oriented toward the operator, and the first (base) module 14 faces downward and is in contact with a substantially horizontal surface (not shown in Fig. 25) upon which the portable computer is placed, with the keyboard facing that substantially horizontal surface. EX1006, 10:24-31.

B. Claims 3 and 13

1. **[3] The portable computer of claim 1, further comprising a first navigation button disposed on one of the base and the display component and configured to permit the user to manipulate selected content displayed on the screen.**

[13] The portable computer of claim 10, further comprising a first navigation button user-accessible in each of the laptop mode and the easel mode, and configured to permit the user to manipulate selected content displayed on the screen.

128. The combination of Lane and Pogue render these claims obvious.

Lane and Pogue render claims 1 and 10 obvious for the reasons I discuss above.

With respect to the additional limitations of claim 3 and 13, each of the right

arrow, left arrow, up arrow, down arrow, home and end keys of Lane's keyboard constitute "navigation buttons."

129. With respect to claim 3, Lane does not explicitly disclose that any key of the keyboard permits a user to manipulate selected content displayed on the screen. However, Pogue discloses "Keyboard Shortcuts" which allow a user to interact with content using various keyboard keys such as the right and left arrow keys, which will collapse or expand a highlighted folder, the up and down arrow keys, which allow a user to "walk" up and down the list of items in a folder, and the home and end keys, which highlight the first or last icon in a folder list.

EX1007, 114. The enter key can be used to open a selected item.

130. With respect to claim 13, each of these keys is user-accessible in the laptop and easel³ modes. Lane, Figs. 1, 6, 8, 20 and 28; *see also* limitations [1pre], [10pre] and [18pre] above. Moreover, while Lane does address whether the keys 36 of the keyboard of the first module are operable in either the laptop or easel mode, a POSITA would have understood that these keys are operable in the laptop mode and would further have understood that they should be active in the easel

³ The 844 patent characterizes the keyboard 106 as accessible on the side of the computer opposite the display in the easel mode. EX1001, 7:59-61. To the extent that qualifies the keyboard 106 as "user-accessible" within the meaning of claim 13, so too is Lane's keyboard when Lane's portable computer 10 is in easel mode.

mode as doing so would allow a user to, e.g., navigate in content using a page up or page down key.

131. Each of the right arrow, left arrow, up arrow, down arrow, enter, home and end keys therefore constitutes a navigation control as recited in these claims.

C. Claims 4 and 14

132. The combination of Lane and Pogue render these claims obvious. Lane and Pogue render claims 1, 3, 10 and 13 obvious for the reasons I discuss above.

1. [4pre], [14pre] The portable computer of claim [3/13], wherein the screen is configured to display at least one of a plurality of modes of content; and

133. Pogue discloses this limitation. Pogue discloses the display of first and second modes of content in the form of the My Documents, My Pictures and My Network Places folder and shortcut desktop icons. See limitations [1e], [10e], [18e], [1f], [10f] and [18f] above.

2. [4a], [14a] wherein the first navigation button is configured to permit the user to select for display one of the plurality of modes of content.

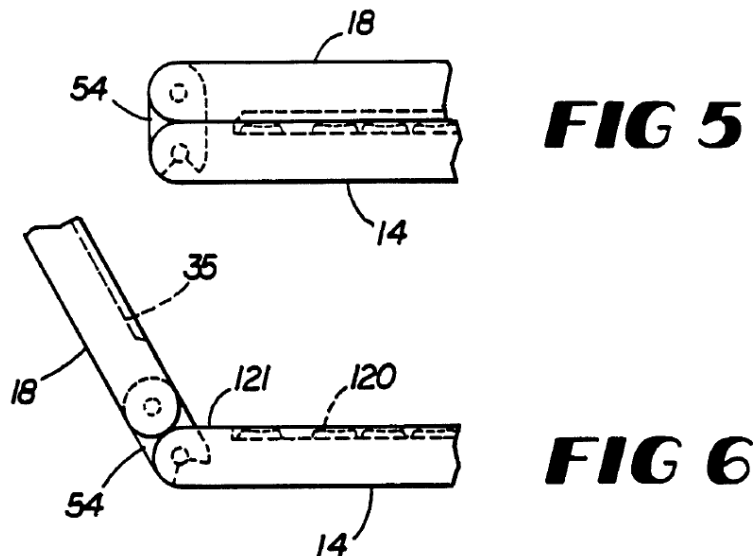
134. The combination of Lane and Pogue renders this limitation obvious. Pogue discloses that the arrow keys can be used to move from one desktop icon to another in order to select a desired desktop icon.

D. Claim 7

1. [7a] The portable computer of claim 1, wherein rotating either the display component or the base component about the longitudinal axis up to approximately 180 degrees from a closed mode in which the screen is disposed substantially against the base configures the portable computer into the laptop mode; and

135. Lane and Pogue render claim 1 obvious for the reasons discussed above. See limitations [1pre], [10pre] and [18pre], and [1c], [10c], and [18c].

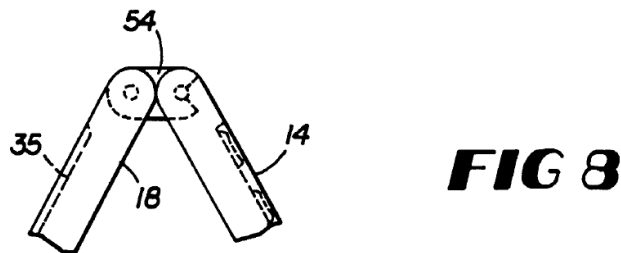
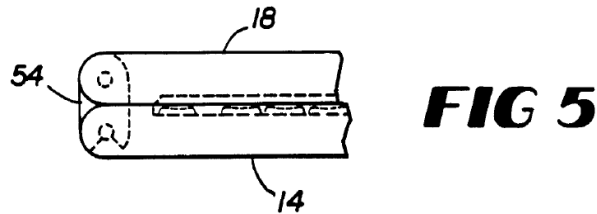
Rotating Lane's second/display module 18 from a closed mode to an angle of approximately 135 degrees with respect to the first/base module 14 configures the portable computer into the laptop mode as shown in Figs. 5 and 6 below:



2. [7b] wherein rotating either the display component or the base about the longitudinal axis beyond approximately 180 degrees from the closed mode configures the portable computer into the easel mode.

136. See limitations [1pre], [10pre] and [18pre], and [1c], [10c], and [18c].

Rotating Lane's first or second display modules 14, 18 from the closed mode to an angle of approximately 320 degrees configures the portable computer into the easel mode as shown in Figs. 5 and 8 below:



- E. [8] The portable computer of claim 1, wherein the frame mode is configured to display to a user on the main display component the first content mode having the first content display orientation.

137. See limitations [1e], [10e], and [18e].

F. Claim 9

- 1. [9] The portable computer of claim 1, wherein the portable computer is configured to prevent the portable computer from responding to keyboard input when the portable computer is in the frame mode.**

138. Lane and Pogue render claim 1 obvious for the reasons discussed above. Lane discloses using the position-indicating mechanism 38 to determine, inter alia, “whether to render keys 36 of the first module 14 inoperable when unused.” EX1006, 5:23-6:6. Lane also discloses the frame mode in Fig. 25. See limitations [1h], [10h], [18h]. Because the keyboard is facing a horizontal surface on which the portable computer rests in the frame mode, a POSITA would understand that the keys 36 of the first module are unused in the frame mode and would therefore have understood that Lane teaches, or at least renders obvious, rendering the keys 36 inoperable in frame mode. A POSITA would further have understood and/or found obvious that rendering keys inoperable prevents them from responding to undesired keyboard input when in frame mode.

G. Claim 16

- 1. [16] The portable computer of claim 10, wherein an operating display mode is selected from the plurality of display modes based on a physical orientation of the portable computer.**

139. Claim 10 recites “an axis of rotation about which both the base and main display components are rotatable to transition the computer between the laptop mode and the easel mode.” EX1001, 18:38-42. Thus, rotation of the

physical base and main display components is how the operating display mode is selected. Rotation of Lane's first and second modules 14, 18 similarly achieves selection of an operating display mode (e.g., laptop or easel) from among the plurality of display modes. See limitations [1c], [10c] and [18c] above.

H. Claim 22

- 1. [22] The portable computer of claim 18, further comprising at least one navigation button disposed on one of the base and the display component.**

140. See claims 3 and 13.

VII. GROUND 2: CLAIMS 1, 3, 4, 7-10, 13, 14, 16, 18 AND 22 ARE OBVIOUS OVER THE COMBINATION OF LANE, POGUE AND HOTELLING

141. As I discuss above in Ground 1 for limitations [1pre], [10pre] and [18pre], Lane discloses to a POSITA that Lane's display 35 is a touchscreen that is operable in all physical configurations of Lane's portable computer 10, or at least would have rendered this obvious to a POSITA. In the event that the Board were to determine that configuring Lane's display 35 as a touchscreen that is operable in all physical configurations/display modes of Lane's portable computer is not disclosed by Lane or rendered obvious by the combination of Lane and Pogue, a POSITA would have found it obvious to do so in view of Lane, Pogue and Hotelling.

142. As I discuss above in Ground 1, Lane's portable computer 10 includes a display 35 and Pogue discloses a graphical user interface that includes the display

of, among other things, icons and shortcuts for folders such as My Documents, My Photos and My Network Places. Section VI.A.6-7. As I discuss in Section V.D, Hotelling discloses that GUI elements such as icons can be selected using an input device on a laptop computer such as personal computer 10 disclosed in Lane. EX1020, ¶¶[0006], [0068]-[0069]. Hotelling further discloses that touchscreens are preferable to other input devices such as touch pads (and mice) because touchscreens are easier to use because they allow a user to directly select a GUI item such as an icon by touching it rather than relying on relative movement on a surface separate from the touchscreen. EX1020, ¶¶[0009], [0069].

143. In view of this teaching in Hotelling, a POSITA would have been motivated to configure the display 35 in Lane's portable computer 10 as a touchscreen that is active in all physical configurations/display modes to make use of the GUI for the selection of GUI items such as folder icons as taught by Pogue as well as other navigation tasks such as menu selections easier for the user. A POSITA would have found it obvious, and been motivated, to make the touchscreen operable in all physical configurations/display modes because doing so would have made it easier for a user to interact with the device's GUI to perform navigation tasks as well as other tasks. This includes configuring Lane's portable computer 10 so that a user could select the My Documents, My Pictures and My Network Places icons and shortcuts as taught by Pogue by directly

touching them with a finger as taught by Hotelling. EX1020, ¶[0068]. A POSITA would have had a reasonable expectation of success in making this combination and modifying Lane's portable computer 10 in this manner because touchscreen and gesturing technology were well-known in the art by the time of the 844 patent and involved no more than ordinary skill.

144. Lane's portable computer 10 modified as I discuss above renders obvious all claims challenged in Ground 1 for the reasons I discuss above in Ground 1.

VIII. GROUND 3: CLAIM 17 IS OBVIOUS OVER LANE, POGUE AND SEGAWA

A. Motivation to Combine Lane and Pogue with Segawa

145. A POSITA would have found it obvious to combine Lane and Pogue in the manner, and for the reasons, I discuss above in Ground 1. A POSITA would further have found it obvious to combine Lane and Pogue with Segawa by implementing Segawa's teaching of (1) including a TV receiver and display function in the portable computer of Lane/Pogue, and (2) providing a "manual activation mode" that allows a user to manually control the display of content that is otherwise automatically controlled in accordance with the physical positioning of a base (Segawa's second shell 1) and a main display component (Segawa's first shell 2).

146. A POSITA would have implemented this manual activation mode teaching from Segawa in the portable computer resulting from the combination of Lane and Pogue by providing the user with the option of having the TV function activate automatically in the portable computer when, e.g., the computer is in the easel mode and also providing the user with an ability to activate the TV function via a menu selection using Lane's navigation control/touchscreen (see discussion of navigation control as a touchscreen in limitation [10g] of Ground 1). Lane discloses the use of his device as a television. EX1006 at 3:12-13 and 9:33. A POSITA would have had a reasonable expectation of success in making these modifications as both TV reception functions and menu selections were well-known in the art and involved only ordinary skill as reflected in Segawa's lack of any detailed description of how to implement a TV reception and display function or the ability to select such a function via a menu.

B. [17] The portable computer of claim 10, wherein an operating display mode is selected from the plurality of display modes in response to operation of the navigation control.

147. As I discuss above in VIII.A, a POSITA would have found it obvious to include Segawa's TV receiver 30 and display functionality (see Segawa at Fig. 6, reference numeral 30 and ¶40) in the Lane/Pogue portable computer. A POSITA would further have found it obvious to provide the user with the option of (i) automatically selecting this functionality depending on the physical configuration

of the base and main display units of the portable computer, and (ii) manually selecting the TV function via a menu using the touchscreen. A touchscreen is a navigation control as I discuss above in Ground 1, limitation [10g]. Accordingly, the combination of Lane, Pogue and Segawa renders this claim obvious as it is construed by Patent Owner.⁴

IX. GROUND 4: CLAIMS 1, 3, 4, 7-10, 13, 14, 16, 18 AND 22 ARE OBVIOUS OVER LANE, POGUE AND MIT

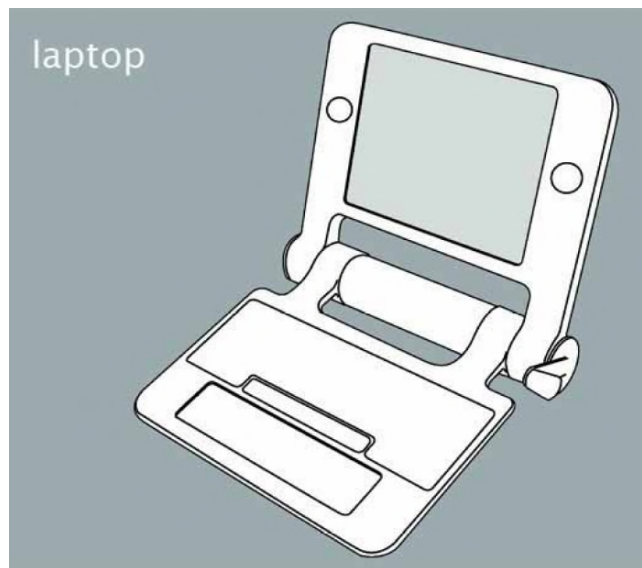
148. To the extent that “an axis of rotation” in claim 10 or any other limitation in claims 10 or 18 are construed as limited to having only one longitudinal axis of rotation, it would have been obvious to modify Lane by substituting the single axis hinge disclosed in MIT for Lane’s dual axis hinge assembly including connectors 54 and axles 86, 102 and modifying the portions of Lane’s first and second modules 14, 18 adjacent the hinge to correspond to MIT’s display and base modules. A POSITA would have been motivated to make these modifications to Lane in order to provide for a place to hold a hand-crank generator as taught by MIT. EX1010, 9. A POSITA would have had a reasonable expectation of success in doing so as single axis hinges of the type disclosed in MIT were known in the art and were well within the skill level of a POSITA.

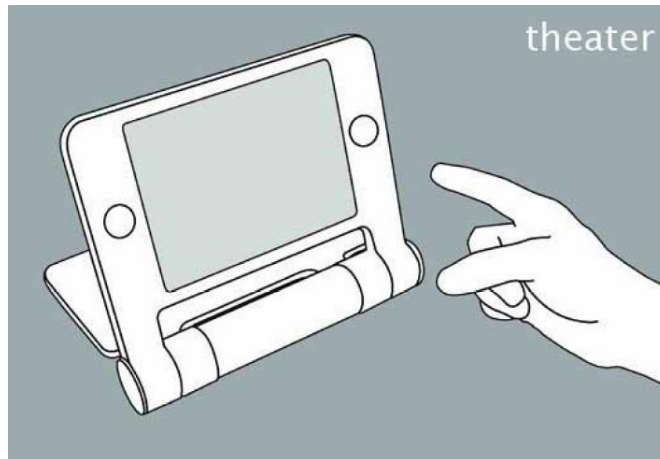
⁴ As indicated in the complaint in the parallel litigation between Patent Owner and HP, Patent Owner construes this term as being satisfied by a tablet mode selection via a menu, which only modifies content shown in the display. EX1013, 60.

149. When modified to incorporate the MIT single axis hinge as described above, Lane's portable computer in combination with Pogue discloses and/or renders obvious each limitation of the challenged claims for this Ground 2. My analysis for those limitations is the same as for Ground 1, except for limitations [1c], [10c] and [18c], which I discuss below.

1. Limitations [1c], [10c], [18c]

150. Lane's portable computer as modified to include MIT's single axis hinge assembly discloses and/or renders obvious these limitations. MIT discloses that its laptop can be configured in a variety of display configurations, including a laptop configuration and a theater configuration as shown below:





EX1010, 7-8. The “theater” display configuration is the claimed frame mode. A POSITA would have understood and/or found it obvious in view of MIT’s disclosure of frame mode that the MIT laptop could also be placed into easel mode. This is because frame mode and easel involve the same amount of rotation of the display and main body components relative to each other about MIT’s single axis hinge, and transitioning from frame to easel mode can be achieved by further rotating the entire laptop device without any additional relative rotation between the display and main body components. With respect to limitation [1c], MIT’s display component includes a single screen as shown in the drawings above.

X. GROUND 5: CLAIMS 1, 3, 4, 7-10, 13, 14, 16, 18 AND 22 ARE OBVIOUS OVER LANE, POGUE, MIT AND HOTELLING

151. As I discuss in Ground 4 above, to the extent that independent claims 1, 10 or 18 are construed as requiring a single-axis hinge, it would have been obvious to a POSITA to modify Lane’s portable computer 10 to include such a single axis hinge as taught by MIT. It would further have been obvious to a

POSITA to configure such a portable computer with a single axis hinge with a touchscreen that was active in all physical configurations/display modes and which could be used to perform navigation tasks such as selecting folder icons and shortcuts like the My Documents, My Pictures and My Network places (the claimed content modes) for the same reasons, with the same motivation and same reasonable expectation of success, as I discuss above in Ground 2.

XI. GROUND 6: CLAIM 17 IS OBVIOUS OVER LANE, POGUE, MIT AND SEGAWA

A. Motivation to Combine Lane and Pogue with Segawa

152. It would have been to combine Lane, Pogue and MIT in the manner, and for the same reasons, I discuss above in Ground 3. A POSITA would have found it obvious to combine Lane, Pogue and MIT with Segawa in the same manner, and for the same reasons, I discuss above in Ground 2 (Section VII.A).

B. [17] The portable computer of claim 10, wherein an operating display mode is selected from the plurality of display modes in response to operation of the navigation control.

153. The limitations of claim 17 are obvious over the combination of Lane, Pogue, MIT and Segawa for the same reasons I discuss above in Ground 2 (Section VII.B).

XII. SECONDARY CONSIDERATIONS

154. I am not aware of any relevant information related to secondary considerations of obviousness. For example, I am not aware of any attempt to

commercialize the claimed technology in a product or through licensing. To the extent Patent Owner comes forward with any such information, I will consider it.

XIII. AVAILABILITY FOR CROSS-EXAMINATION

155. In signing this declaration, I recognize that the declaration 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 within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during a time as mutually agreed between the parties.

XIV. RIGHT TO SUPPLEMENT

156. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises. This declaration represents only those opinions that I have formed to date. I reserve the right to revise, supplement, and/or amend my opinions stated herein based on new information that becomes available to me and on my continuing analysis of the materials already provided.

XV. CONCLUSION

157. I may utilize the documents cited and/or listed herein, or portions of those documents, as exhibits at any hearing or trial in this proceeding. I may further prepare and use exhibits that summarize portions of my testimony or key

terms or concepts presented therein, or other demonstrative exhibits, at any hearing or trial in this proceeding.

158. I reserve the right to supplement my testimony and this report in response to any judicial determinations, in response to the arguments expressed by the Patent Owner or the opinions of the Patent Owner's experts in this proceeding, and/or in light of additional evidence or testimony brought forth at trial or otherwise brought to my attention after the date of my signature below.

I hereby declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct, and that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I understand that willful false statements are punishable by fine or imprisonment or both. *See* 18 U.S.C. § 1004.

Dated: 1/25/2024



Dr. Andrew Wolfe

EXHIBIT A

Andrew Wolfe Ph.D.

2005 De La Cruz Blvd STE 142
Santa Clara, CA 95050
(408) 394-1096 (mobile)
Email: awolfe@awolfe.org

Education:

Ph.D. in Electrical and Computer Engineering, Carnegie Mellon University, 1992
Visiting Graduate Student, Center for Reliable Computing, Stanford University, 1988-1989
M.S. in Electrical and Computer Engineering, Carnegie Mellon University, 1987
B.S.E.E. in Electrical Engineering and Computer Science, The Johns Hopkins University, 1985

Recent Employment:

Lecturer, [September 2013-present]
Santa Clara University

Teaching graduate and undergraduate courses on embedded computing, mechatronics, real-time systems, computer architecture, design, and community service. Faculty Senate President 2023-24.

Consultant, [October 2002-present]
Wolfe Consulting

Consultant on processor technology, computer systems, consumer electronics, software, design tools, and intellectual property issues. Testifying and consulting expert for IP and other technology-related litigation matters.

Sample clients include:

Google	Apple	Samsung
Sony	Huawei	HTC
AT&T	Verizon Mobile	T-Mobile
IBM	Motorola/Lenovo	Nintendo
Activision	AMD	Western Digital
Sonos	Qualcomm	LG
Netflix	Roku	Tivo
Synaptics	Sawstop	3M
Medigus	TCL	ZTE
Egnyte	Acer	Waymo

Chief Technical Officer, [1999-2002]; Sr. VP of Business Development, [2001-2002]; VP, Systems Integration, S3 Fellow, [1998 – 1999]; Director of Technology, S3 Fellow, [1997 - 1998]
SONIC|blue, Inc., Santa Clara, CA (formerly S3 Inc.)

Strategic Business Development:

Developed and implemented strategy to reposition S3 from PC graphics into the leading networked consumer electronics company.

- Acquired Diamond Multimedia and coordinated integration of communications, Rio digital music, and workstation graphics divisions into S3.
- Identified and negotiated acquisitions to grow digital media businesses including Empeg, ReplayTV, and Sensory Science.
- Identified and negotiated strategic investments including Comsilica, Intellon, KBGear Interactive, Entridia, DataPlay and others.

- Developed strategy for integrated graphics/core-logic products and established a joint venture with Via Technologies to design and market these products.
- Negotiated divestiture of graphics chip business to Via and the workstation graphics division to ATI.

Product Planning and Development:

- Drove roadmap development within SONICblue product divisions.
- Managed Business Development for all product lines.
- Led New Product Development and Corporate Vision processes.
- Acting co-General Manager of Rio digital music business in 2nd half of 2001. Responsible for all areas of product development, business development, and cost management.
- Managed development of the Savage/MX and Savage/IX mobile 3D graphics accelerators and Savage/NB system logic products.

Public Relations, Public Policy and Investor Relations:

- Present company products and strategy at industry events such as CES, Comdex, and Microprocessor Forum.
- Discuss new products and initiatives with the press.
- Promote issues of interest to SONICblue to industry groups and in Washington.
- Brief analysts, and investors on company progress. Participate in quarterly conference calls.

IP Management and Licensing:

- Negotiated and managed partnership agreements including a critical cross-licensing agreement with Intel.
- Renegotiated technology-licensing agreements with IBM for workstation graphics products.
- Evaluated outside technology opportunities, managed video research and development, and managed corporate IP strategy with legal staff including patent filings, cross licensing, and litigation.

Consulting Professor, [1999-2002]

Stanford University, Stanford, CA

Teaching computer architecture and microprocessor design.

Assistant Professor [1991 - 1997]

Princeton University, Princeton, NJ

Teaching and research in the Electrical Engineering department. Research in embedded computing systems, multimedia, video signal processors, compiler optimization, and high performance computer architecture.

Principal investigator or project manager for ~\$6M in funded research.

Visiting Assistant Professor, [1992]

Carnegie Mellon University, Pittsburgh, PA

Research and preparation of teaching materials on advanced microprocessor designs including new superscalar and superpipelined processor architectures.

Founder and Vice President and Consultant, [1989 - 1995]

The Graphics Technology Company, Inc., Austin, TX

Founded company to develop touch-sensitive components and systems for the first generation of PDA devices and interactive public systems. Obtained financing from Gunze Corp., Osaka, Japan. Company is now part of 3M.

Senior Electrical Engineer, [1989]

ESL - TRW, Advanced Technology Division, Sunnyvale, CA

Designed the architecture for an Intel i860-based multiple-processor digital signal processing system for advanced military applications. Designed several FPGA interface chips for VME-bus systems.

Design Consultant. [1986 -1987]

Carroll Touch Division, AMP Inc., Round Rock, TX

Developed several new technologies for touch-screen systems. Designed the first ASIC produced for AMP, a mixed-signal interface chip for controlling touch-screen sensors. Developed the system electronics, system firmware, and customer utility software for numerous products including those based on the new ASIC.

Senior Design Engineer. [1983 -1985]

Touch Technology Inc., Annapolis, MD

Advisory Boards:

Director, Turtle Beach Corporation (NASDAQ:HEAR) (formerly Parametric Sound Corporation), KBGear Interactive, Inc., Comsilica, Inc., Rioport.com, various S3 subsidiaries.

Technical Advisory Boards, Ageia, Inc., Intellon, Inc., Comsilica, Inc., Entridia, Inc., Siroyan, Ltd., BOPS, Inc, Quester Venture Funds

Carnegie Mellon University Silicon Valley Advisory Board; Johns Hopkins University Tech Transfer Advisory Board

Awards:

IEEE Fellow - for contributions in hardware code compression of embedded software, power consumption analysis, and optimization, 2022

IEEE Computer Society Distinguished Contributor - 2021

Micro Test-of-Time Award (in recognition of one of the ten most influential papers of the first 25 years of the symposium), 2014

Business 2.0 "20 Young Executives You Need to Know", 2002

Walter C. Johnson Prize for Teaching Excellence, 1997.

Princeton University Engineering Council Excellence in Teaching Award, Spring 1996

AT&T/Lucent Foundation Research Award, 1996.

Walter C. Johnson Prize for Teaching Excellence, 1995

IEEE Certificate of Appreciation, 1995, 2001.

AT&T Foundation Research Award, 1993.

Semiconductor Research Corporation Fellow, 1986 - 1991.

Burroughs Corporation Fellowship in Engineering, 1985 - 1986.

Professional Activities:

Program Chair: Micro-24, 1991, Hot Chips 13, 2001.

General Chair: Micro-26, 1993, Micro-33, 2000.

Associate Editor: IEEE Computer Architecture Letters; ACM Transactions in Embedded Computing Systems

Speaker at CES, WinHec, Comdex, Intel Dev. Forum, Digital Media Summit, Microprocessor Forum, etc.

Keynote speaker at Micro-34, ICME 2002

IEEE B. Ramakrishna Rau Award committee – 2012-2016

IEEE Computer Society Awards Committee – 2015

CES Awards Judge – 2016

Entrepreneurship Mentor – Draper University

Over 50 refereed publications.**Publications since January 2006:**

Wolfe, A., "Retrospective on Code Compression and a Fresh Approach to Embedded Systems", IEEE MICRO, July/Aug. 2016, Invited paper.

Patents:

- U.S. Pat. 5,041,701 – *Edge Linearization Device for a Contact Input System*, Aug. 20, 1991.
- U.S. Pat. 5,438,168 – *Touch Panel*, Aug. 1, 1995.
- U.S. Pat. 5,736,688 – *Curvilinear Linearization Device for Touch Systems*, Apr. 7, 1998.
- U.S. Pat. 6,037,930 – *Multimodal touch sensitive peripheral device*, March 14, 2000.
- U.S. Pat. 6,408,421 – *High-speed asynchronous decoder circuit for variable-length coded data*, June 18, 2002.
- U.S. Pat. 6,865,668 – *Variable-length, high-speed, asynchronous decoder circuit*, March 8, 2005
- U.S. Pat. 7,079,133 – *Superscalar 3D Graphics Engine*, July 18, 2006
- EP 1 661 131 B1 – *PORTABLE ENTERTAINMENT APPARATUS*, Jan. 21, 2009
- U.S. Pat. 7,555,006 – *Method and system for adaptive transcoding and transrating in a video network*, June 30, 2009
- U.S. Pat. 7,996,595 – *Interrupt Arbitration for Multiprocessors*, Aug. 9, 2011
- EP 2 241 979 B1 – *Interrupt Arbitration for Multiprocessors*, Oct. 10, 2011
- U.S. Pat. 8,131,970 – *Compiler Based Cache Allocation*, March 6, 2012
- U.S. Pat. 8,180,963 – *Hierarchical read-combining local memories*, May 15, 2012
- U.S. Pat. 8,193,941 – *Snoring Treatment*, June 5, 2012
- U.S. Pat. 8,203,541 – *OLED display and sensor*, June 19, 2012
- U.S. Pat. 8,243,045 – *Touch-sensitive display device and method*, August 14, 2012
- U.S. Pat. 8,244,982 – *Allocating processor cores with cache memory associativity*, August 14, 2012
- U.S. Pat. 8,260,996 – *Interrupt Optimization for Multiprocessors*, Sept. 4, 2012
- 101185761 (KR) – *Noise Cancellation for Phone Conversation*, Sept. 19, 2012
- 101200740 (KR) – *OLED display and sensor*, November 7, 2012
- 101200741 (KR) – *Touch-sensitive display device and method*, November 7, 2012
- U.S. Pat. 8,321,614 – *Dynamic scheduling interrupt controller for multiprocessors*, Nov. 27, 2012
- U.S. Pat. 8,352,679 – *Selectively securing data and/or erasing secure data caches responsive to security compromising conditions*, Jan. 8, 2013
- U.S. Pat. 8,355,541 – *Texture Sensing*, Jan. 15, 2013
- U.S. Pat. 8,370,307 – *Cloud Data Backup Storage Manager*, Feb. 5, 2013
- U.S. Pat. 8,398,451 – *Tactile Input Interaction*, March. 19, 2013
- JP 5241032 B2 – *Routing Across Multicore Network Using Real World or Modeled Data*, April 13, 2013
- ZL201010124820.3 – *Interrupt Optimization for Multiprocessors*, April 17, 2013
- U.S. Pat. 8,428,438 – *Apparatus for Viewing Television with Pause Capability*, April 23, 2013
- JP 5266197 B2 – *Data Centers Task Mapping*, May 10, 2013
- U.S. Pat. 8,508,498 – *Direction and Force Sensing Input Device*, August 13, 2013
- U.S. Pat. 8,547,457 – *Camera Flash Mitigation*, October 1, 2013
- U.S. Pat. 8,549,339 – *Processor core communication in multi-core processor*, October 1, 2013
- 101319048 (KR) – *Camera Flash Mitigation*, October 10, 2013
- U.S. Pat. 8,628,478 – *Microphone for remote health sensing*, January 14, 2014
- 101362017 (KR) – *Thread Shift: Allocating Threads to Cores*, Feb. 5, 2014
- 101361928 (KR) – *Cache Prefill on Thread Migration*, Feb. 5, 2014
- 101361945 (KR) – *Mapping Of Computer Threads onto Heterogeneous Resources*, Feb. 5, 2014
- JP 5487307 B2 – *Mapping Of Computer Threads onto Heterogeneous Resources*, Feb. 28, 2014
- JP 5484580 B2 – *Task Scheduling Based on Financial Impact*, Feb. 28, 2014
- JP 5487306 B2 – *Cache Prefill on Thread Migration*, Feb. 28, 2014
- 101372623 (KR) – *Power Management for Processor*, March. 4, 2014
- 101373925 (KR) – *Allocating Processor Cores with Cache Memory Associativity*, March 6, 2014
- U.S. Pat. 8,676,668 – *Method for the determination of a time, location, and quantity of goods to be made available based on mapped population activity*, March 18, 2014
- U.S. Pat. 8,687,533 – *Energy Reservation in Power Limited Networks*, April 1, 2014
- 101388735 (KR) – *Routing Across Multicore Networks Using Real World or Modeled Data*, April 17, 2014
- U.S. Pat. 8,725,697 – *Cloud Data Backup Storage*, May 13, 2014
- U.S. Pat. 8,726,043 – *Securing Backing Storage Data Passed Through a Network*, May 13, 2014
- ZL201010124826.0 – *Dynamic scheduling interrupt controller for multiprocessors*, May 14, 2014
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