

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TD AMERITRADE HOLDING CORPORATION, TD AMERITRADE, INC.,
AND TD AMERITRADE ONLINE HOLDINGS CORP.

PETITIONERS

v.

TRADING TECHNOLOGIES INTERNATIONAL, INC.
Patent Owner

Patent No. 7,676,411

**DECLARATION OF KENDYL A. ROMÁN
IN SUPPORT OF PETITION FOR
COVERED BUSINESS METHOD REVIEW OF U.S. PATENT 7,676,411**

I, Kendyl A. Román, declare as follows:

1. I have been engaged by Sterne, Kessler, Goldstein & Fox P.L.L.C. on behalf of Petitioners, TD Ameritrade Holding Corporation, TD Ameritrade, Inc., and TD Ameritrade Online Holdings Corp. (“Petitioners”) for the above-captioned covered business method review proceeding. I understand that this proceeding involves United States Patent 7,676,411, entitled “Click based trading with intuitive grid display of market depth,” by Gary Allan Kemp, II, filed October 25, 2006 and issued March 9, 2010, (the “’411 Patent”). I understand that the ’411 Patent is currently assigned to Trading Technologies International, Inc. (“TTI”).

2. I understand the ’411 Patent claims benefit from U.S. provisional application 60/186,322. For purposes of the covered business method review, I assume the earliest possible priority date of the ’411 Patent is the March 2, 2000 filing date of U.S. provisional application 60/186,322.

3. I have reviewed and am familiar with the specification of the ’411 Patent. I understand that the ’411 Patent has been provided as Exhibit 1001. I will cite to the specification using the following format (’411 Patent, 1:1-10). This example citation points to the ’411 Patent specification at column 1, lines 1-10.

4. I have reviewed and am familiar with the file history of the ’411 Patent. I understand that the file history has been provided as Exhibit 1002.

5. I have also reviewed and am familiar with the following prior art used in the Petition for Covered Business Method Review of the '411 Patent:

- U.S. Patent No. 5,077,665 to Silverman et al. (“Silverman”). I understand that Silverman has been provided as Exhibit 1003.
- U.S. Patent No. 5,297,031 to Gutterman et al. (“Gutterman”). I understand that Gutterman has been provided as Exhibit 1004.
- U.S. Patent No. 5,375,055 to Togher et al. (“Togher”). I understand that Silverman has been provided as Exhibit 1005.
- A certified translation of “System for Buying and Selling Futures and Options Transaction Terminal Operational Guidelines” (“TSE”). A understand that the original Japanese language document was provided as Exhibit 1006, the certified translation provided as Exhibit 1007, and the certification of translation provided as Exhibit 1008.

6. A complete listing of additional materials considered and relied upon in preparation of my declaration is provided as Exhibit 1020. I have relied on these materials to varying degrees. Citations to these materials that appear below are meant to be exemplary but not exhaustive.

7. The '411 Patent describes click based trading with intuitive grid display of market depth. ('411 Patent, Title.) I am familiar with the technology described in the '411 Patent as of the earliest possible priority date of the '411 Patent (March 2, 2000).

8. I have been asked to provide my technical review, analysis, insights and opinions regarding the '411 Patent and the above-noted references that form the basis for the grounds of unpatentability set forth in the petition for Covered Business Method Review of the '411 Patent.

I. QUALIFICATIONS

9. See my Curriculum Vitae provided as Exhibit 1020 for a listing of my qualifications. This includes a list of publications for the past 10 years or more.

10. My expertise qualifies me to do the type of analysis required in this case. Of particular relevance, I have been involved in the design, implementation, testing, and analysis of computer software, firmware, and hardware for over thirty years, including software architecture, graphical user interfaces, trading systems, and other networked, data-driven, client-server systems. My work has included analysis of trading systems including source code and user interfaces. In addition, I have practical experience in the design and programming of a variety of computer

systems ranging from handheld devices, to laptops and desktop computers, to large multi-layer networked database systems.

11. As a freshman at Brigham Young University (“BYU”) in 1976, I started writing programs for IBM computers.

12. In 1980, I worked with Apple II computers and wrote computer programs having graphic user interfaces.

13. In the late 1960’s and 1970’s the University of Utah was known for its pioneering work in computer graphics (and the Internet¹). At BYU, I got involved with computer graphics and wrote graphics programs. Many of my BYU professors had been at the University of Utah during its computer science pioneering years. One of my BYU professors, Alan Ashton, and a fellow computer science student, Bruce Bastian, worked together on word processing software with graphical display. Later, Professor Ashton and Bruce Bastian founded WordPerfect.

14. I graduated with High Honors from Brigham Young University where I received a Bachelor of Science degree in Computer Science. My formal studies

¹ In 1969, University of Utah was one of the first four nodes on the Internet.

included computer architecture, computer programming, programming languages, algorithms, operating systems, database systems, and digital logic design.

15. In 1981, I worked at International Business Machines (“IBM”) in San Jose, CA. At IBM, I had a graphics display on my desk and wrote programs that displayed custom graphics. During my employment at IBM, the IBM PC was released. The IBM PC also supported graphical user interfaces.

16. In 1982, at Dialogic, I improved the performance of the Computer Aided Design (“CAD”) software.² The CAD software drew polygons on the graphical display and placed them along value axes.

17. In this timeframe, I had experience with Tandy computers, including the TRS-80, and with Commodore VIC 20 computers, which supported graphical user interfaces.

18. In 1984, I starting writing programs for the Apple Lisa and Macintosh, which had a sophisticated graphical user interface built into the firmware and operating system. Both Lisa and Macintosh used a one-button mouse as a

² The software, the Lucas Drawing System, had been developed by Lucas Films to aid in the production Star Wars.

pointing device. The user controls various operations by clicking, double clicking, or dragging the mouse. Such operations are affected by release the mouse button. For example, a mouse click is defined by the release of a mouse button within a set number of pixels from where it was depressed. A double click is defined by the second release when clicking twice. Likewise, a click and drag is depressing the button to select the item, and releasing the mouse button to release it at the desired location or value.

19. I developed a Macintosh program that drew graphical icons (or polygons) on the display.³ The icons changed size base on a numerical value. The user interface allowed for a window to be displayed that showed the numerical value as text.

³ An article regarding the software was published in MacWorld Magazine around February 1987. A review was published in 1990 by the Boston Computer Society, which also showed various features of the user interface. *See* http://www.wolfpup.org/misc/MacBaby_Math_review.pdf.

20. Next in 1986, I started consulting at Hewlett Packard (“HP”) where I became familiar with standard printer description languages and graphic command languages. During this time I used X-Windows.

21. Later, in 1988 through 1990, at Tandem (now Compaq, now HP), I worked with CAD systems and hardware simulators, which used graphical user interfaces and included pop-up windows that provided textual representations of values related to graphical displays.

22. In 1990, I authored portions of the Macintosh Programming Fundamentals: Self-paced Training course interactive CD-ROM and lab book.

23. I returned to HP in 1991 where I worked with diagnostic tools, including exercises and verifiers. During this period, I was involved in testing various graphics adapters and display devices throughout the HP product line. I worked with a X-Windows based diagnostic tool that displayed an icon for every component of the system. The number, type, and locations of the icons were based on the components actually found in the system. The icons were dynamically changed to represent the status of the testing.

24. In 1991 and 1992, at Slate and Apple, I worked with the pen based tablets and handheld computers including, the NCR tablet and Newton PDA.

25. In 1993 and 1994, I taught classes for Mentor Graphics to hardware designers regarding hardware simulation and design verification software. Mentor Graphics' CAD system had the features discussed above regarding CAD software. In addition, I taught users how to customize CAD software to perform complex custom operations based on a single action with a user input device.

26. In 1993 and 1994, at Apple I worked with the Apple Media Tool team and the SK8 team, which included working with state of the art graphic display systems.

27. In the early 1990s, before the World Wide Web became commercialized, multimedia technology was becoming state of the art. During this time, interactive CD-ROMs, early commercial Internet sites, high-resolution color animation, and digital video were state of the art technologies. While at The Carl Group, I formed the Multimedia Lab. Projects included porting a program to automate layout of ball grid assemblies (BGA), updating automatic test equipment software to use state of the art graphical user interfaces, developing graphic animations, developing multimedia authoring tools and various interactive CD-ROM titles. My work with multimedia authoring tools included developing low-level graphics software for both the Macintosh and IBM PC platforms.

28. We sold our multimedia authoring tools to the public and I developed an interactive user interface, which allowed users to enter and confirm information including prices and quantities, which resulted in an order being sent to our server.

29. Also in the mid-1990s, we developed a database driven, on-demand catalog publish system for Sun, which allowed users to configure and order products on via a graphical user interface. At Sun, I used workstations using Open Look, which was a graphical user interface based on pioneering work at Xerox PARC, and which was competitive with X Windows which was being used by Hewlett Packard.

30. In the mid-1990s, I developed a medical communications device that could transmit medical quality video images over the Internet in real time. This work included developing various graphical user interfaces. I have patents on some of this technology as discussed below.

31. During this time, I was familiar with the graphical user interfaces in various medical devices. These included EKG, ultrasound, and medical records systems.

32. In many of these professional assignments, I analyzed the architecture, function, and operation of software with graphical user interfaces.

33. Prior to being retained in this matter, I have acquired and performed forensic analysis of several computer systems. In particular, in 1999-2002, I performed the technical analysis of both copyright and trade secrets in the *Tradescape.com, Inc., et al. v. Shivaram, et al.* cases. In those cases, I reviewed the source code and operations of the market-leading day trading systems and illicit copies. I also surveyed the current state of the art to address the trade secrets versus what was publicly known. Tradescape was later acquired by E*Trade.

34. As part of my review of the operations in the *Tradescape* engagement, I personally observed day traders conducting tens of thousands of dollars of transactions within seconds. For example, I observed one trader buy 10,000 shares of stock and then immediately buy another 10,000 shares using the same default quantity (*i.e.*, 10,000) within two seconds. Then, this same trader sold all 20,000 shares at a substantial profit less than a minute later.

35. I worked on the *Datamize v. Fidelity, Scottrade, Interactive Brokers Group, et al.* patent case, which involved user interfaces used by the defendants in their trading software.

36. I performed a code review for a patent case, *Chicago Board Options Exchange v. International Securities Exchange*, which involved security exchange trading software.

37. Further, I have extensive experience in designing, developing and analyzing database, networked systems and their user interfaces. As a result, I have had access to the type of components and information at issue in this case and have contemporaneous knowledge of what was publicly known.

38. My Curriculum Vitae identifies over 60 issued patents and over 60 published patent applications for which I am listed as an inventor or assignee. Several of my inventions include graphical user interfaces and networked client-server systems, these include:

- U.S. 8,590,777, Space equipment recognition and control using handheld devices
- U.S. 8,500,563, Display, device, method, and computer program for indicating a clear shot
- U.S. 8,282,493, Display, device, method, and computer program for indicating a clear shot
- U.S. 7,698,653, Graphical user interface including zoom control box representing image and magnification of displayed image
- U.S. 7,424,473, System and method for asset tracking with organization-property-individual model

- U.S. 7,257,158, System for transmitting video images over a computer network to a remote receiver
- U.S. 7,191,462, System for transmitting video images over a computer network to a remote receiver
- U.S. 6,803,931, Graphical user interface including zoom control box representing image and magnification of displayed image

39. I have reviewed and analyzed numerous patents and prior art systems through my litigation support work, including patents and prior art related to the architecture and operation of computer systems including graphics. I have taken a number of courses offered by the U.S. Patent and Trademark Office and the Sunnyvale Center for Innovation, Inventions, and Ideas (Sci3).

40. Both Federal and State Courts have recognized me as an expert in computer software including trading systems and graphical user interfaces, computer architecture, computer hardware, database systems, networks, and computer forensic science.

41. In addition, I recently served as a Special Master in a Federal District Court in *Paycom Payroll, LLC v. Richison and Period Financial*, which included financial systems with graphical user interfaces. I have served as a court-appointed

expert in San Jose, CA, in *Aspect Communications Corporation v. eConvergent, Inc. et al.*, which included financial systems with graphical user interfaces, and in *Ribeiro v. Weichselbaumer*, which included financial and graphical analysis.

A. Testifying Engagements

42. Cases in which I have testified as an expert witness at trial or by deposition during the previous four years are identified as:

Eastern District of Virginia, Alexandria, 1:11-cv-01203,
Reporting Technologies, Inc. v. Emma, Inc.

Central District of California, Los Angeles, 2:10-cv-07678,
Futurelogic, Inc. v. Nanoptix, Inc.

Southern District of Texas, Houston, 3:08-cv-119,
Wellogix v. Accenture

Northern District of California, San Jose, 09-cv-01808,
Embry v. Acer America

Southern District of Texas, Houston, 4:09-cv-1511,
Wellogix v. BP

43. Also the following is the case identification of the cases where I have provided recent reports or declarations but have not testified:

- District of Minnesota, 12-cv-1357, Twin City Fan Companies, Ltd. v. FPT Software

- Superior Court of California, Riverside County, Indio, INC 1108128, Malanche v. Eisenhower Medical Center
- Central District of California, Western Division, 2:12-cv-05257, Innersvingen AS v. Sports Hoop, Inc
- Western District of Oklahoma, 09-cv-488, Paycom Payroll, LLC v. Richison and Period Financial Corporation

44. Some additional prior cases related to software interfaces, graphics, and patent analysis, include: *Konrad v. General Motors, et al.*; *ACTV, Inc. and HyperTV Networks, Inc. v. The Walt Disney Co., ABC, Inc. and ESPN, Inc.*; and *Collaboration Properties v. Polycom.*

45. In *Konrad v. General Motors, et al.*, I analyzed the source code and operation of data-driven web sites for many of the largest companies in America. The graphical user interfaces displayed current quantity and pricing, and allowed order placement and confirmation for airline seats, rental cars, and hotel rooms. Many of these systems allowed for available commodities to be display in order of price or other values.

46. In *ACTV v. Disney*, I analyzed the Disney (ABC and ESPN) interactive television system that included an interactive graphical user interface.

47. In *Collaboration Properties v. Polycom*, I analyzed video conferencing systems including telephony and graphics output systems and standards.

48. My Curriculum Vitae contains further details on my education, experience, publications, and other qualifications to render an expert opinion. My work on this case is being billed at a rate of \$495.00 per hour, with reimbursement for actual expenses. My compensation is not contingent upon the outcome of this covered business method review or the litigation involving the '411 Patent.

II. MY UNDERSTANDING OF CLAIM CONSTRUCTION

49. I understand that, during a covered business method review, claims are to be given their broadest reasonable construction in light of the specification as would be read by a person of ordinary skill in the relevant art.

I. MY UNDERSTANDING OF OBVIOUSNESS

50. I am not a lawyer and will not provide any legal opinions. Although I am not a lawyer, I have been advised certain legal standards are to be applied by

technical experts in forming opinions regarding meaning and validity of patent claims.⁴

51. I understand that a patent claim is invalid if the claimed invention would have been obvious to a person of ordinary skill in the field at the time of the purported invention, which is often considered the time the application was filed. This means that even if all of the requirements of the claim cannot be found in a single prior art reference that would anticipate the claim, the claim can still be invalid.

52. As part of this inquiry, I have been asked to consider the level of ordinary skill in the field that someone would have had at the time the claimed invention was made. In deciding the level of ordinary skill, I considered the following:

- the levels of education and experience of persons working in the field;
- the types of problems encountered in the field; and

⁴ I have relied on the Federal Circuit Bar Association Model Patent Jury Instructions, February 18, 2010, as well as my own experience regarding cited cases.

- the sophistication of the technology.

53. To obtain a patent, a claimed invention must have, as of the priority date, been nonobvious in view of the prior art in the field. I understand that an invention is obvious when the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art.

54. I understand that to prove that prior art or a combination of prior art renders a patent obvious, it is necessary to (1) identify the particular references that, singly or in combination, make the patent obvious; (2) specifically identify which elements of the patent claim appear in each of the asserted references; and (3) explain how the prior art references could have been combined in order to create the inventions claimed in the asserted claim.

55. I understand that certain objective indicia can be important evidence regarding whether a patent is obvious or nonobvious. Such indicia include: commercial success of products covered by the patent claims; a long-felt need for the invention; failed attempts by others to make the invention; copying of the invention by others in the field; unexpected results achieved by the invention as compared to the closest prior art; praise of the invention by the infringer or others

in the field; the taking of licenses under the patent by others; expressions of surprise by experts and those skilled in the art at the making of the invention; and the patentee proceeded contrary to the accepted wisdom of the prior art.

III. LEVEL OF ORDINARY SKILL IN THE ART

56. One of ordinary skill in the art at the time of the alleged invention, would have had the equivalent of a Bachelor's degree or higher in computer science and at least 2 years working experience designing graphical user interfaces, and direct or indirect experience with trading or related systems.

IV. BACKGROUND OF THE TECHNOLOGIES DISCLOSED IN THE '411 PATENT

A. Computer Hardware, Software, and Firmware

57. Originally, computers were composed only of physical circuits, known as hardware,⁵ that were programmed by physically configuring wires (like a telephone switch board operator). Computer programs (a series of computer

⁵ Hardware is the tangible components of a computing system, such as vacuum tubes, wires, circuit boards and other discrete components.

instructions) stored in memory are known as software,⁶ because they can be modified much more easily than hardware. In the late 1970s, personal computers (PCs) became commercial products (such as the Apple II in 1977). In some PCs, a bootstrap loader and other basic input and output programs were permanently stored in hardware chips, known as read-only-memories (“ROM”). These programs recorded indelibly in ROM were no longer “soft” enough to be modified, but could be changed by replacing one socketed ROM with another ROM containing another version of the program. Because they are intimately bonded with the hardware, these programs are called firmware.⁷

⁶ Software is a “generic term for those components of a computer system that are intangible rather than physical. It is most commonly used to refer to the programs executed by a computer system as distinct from the physical hardware of that computer system, and to encompass both symbolic and executable forms for such programs.” (Oxford Dictionary ‘software’)

⁷ Generally, firmware refers to CPU instructions stored in a programmable ROM.

A. Input/Output Adapters and User Input Devices

58. In addition to the CPU and main memory, a computer usually has various input and output (or I/O) devices. I/O devices include disks, tapes, keyboards and other input devices, displays, printers, and communications devices. Disks and tapes are also known as memory or storage, and (as discussed above) are distinguished from main memory by the term “secondary memory.” Other input devices include mice, pens, tablets, touch pads, touch screens, and cameras.

B. Display, Pixel, and Video Frame

59. When Philo T. Farnsworth invented electronic television in the late 1920's, he modified a vacuum tube to control the movement of an electron beam from the cathode (the negative terminal) on the back the tube to scan across the screen on the other side of the tube (the anode, or positive terminal). Where the beam hits the glass (and coating of phosphors) the glass glows. Magnetic coils deflect the electron beam. In television, the entire front of the tube is scanned repetitively in a fixed pattern called a raster. The intensity of the electron beam is modified to change the brightness on point along the raster scan. The result points on the screen are called picture elements, or “pixels.”

60. In the United States the National Television System Committee (“NTSC”) standard defines a raster of 525 scan lines, which refresh at 30 times a

second. Each time the video screen is refreshed the contents is a frame of video data. The frame is interlaced with odd and even line fields with a field changing 60 times a second. The NTSC standard also set a 4:3 aspect ratio. Even though there are 525 lines, the visible area is generally 480 lines high which results in an array of pixels which 640 pixels wide, or 640 x 480 pixel resolution.

C. Bits, Bitmaps, Pixmaps, and Graphic Images

61. A binary digit (“bit”) can have a value of zero (0) or one (1).

Computer digital logic uses zero to represent “false” and one to represent “true”, thus 0 is false and 1 is true.

62. A bit map originally was a data structure having one bit for each pixel.⁸ This are now referred to as Black and White (“B&W”) bitmaps, or two

⁸ In 1984, when the Apple Macintosh was released, it had a black and white screen and its screen buffer was a true bitmap, named screenBits, in a special location in main memory. “The Macintosh screen itself is one large visible bit image. The upper 21,888 bytes of memory are displayed as a matrix of 175,104 pixels on the screen, each bit corresponding to one pixel...The screen is 342 pixels tall and 512 pixels wide” (Inside Macintosh, Promotional Edition, p. 12).

color bitmaps. A one would turn on the electron beam for that pixel and a zero would turn off the electron beam. A bitmap could be created to define a character. For example, in CGA a character was defined as an 8x8 bitmap.

63. The same concept was applied to create a color bitmap, or pixel map (“pixmap”) where more than one bit represents the color for each pixel. Like B&W bitmaps, a color bitmap is a consecutive array of pixel data, where there more than one bit makes up the array elements. In some contexts, the term bitmap is used to refer to pixmaps, as well as B&W bitmaps.

64. A bitmap can also be used to store a graphic image as an array of color values for each point in the image. For example, the Macintosh used bitmaps for icons in its Graphical User Interface (GUI). Further, Windows and OS/2 have a bitmap file format (.BMP). JPEG, TIFF, GIF, and PNG also store bitmaps in a compressed format.

65. Graphic images can also be drawn (or rendered) using graphic commands. Rectangles, circles, and other polygons can be drawn having different sizes and colors.

V. OVERVIEW OF THE '411 PATENT

66. The '411 Patent is directed to a “method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities.” ('411 Patent , Abstract.) The '411 Patent refers to a trading system called “Mercury” that allegedly “ensure[d] fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.” ('411 Patent, Abstract.)

67. The specification further stresses that “the present invention is directed to a graphical user interface for displaying the market depth of a commodity traded in a market, including a dynamic display for a plurality of bids and for a plurality of asks in the market for the commodity and a static display of prices corresponding to the plurality of bids and asks.” ('411 Patent, 3:15-20.) “Also described herein is a method and system for placing trade orders using such displays.” ('411 Patent, 3:22-24.)

68. A bid is an order to buy a financial instrument or security, such as a stock, a stock option, or a future, at a specific price. An ask, sometimes called an offer, is an order to sell a financial instrument at a specific price.

69. For example, Fig. 3 of the '304 Patent, graphically shows bids and asks. The "Mercury display is a static vertical column of prices with the bid and ask quantities displayed in vertical columns to the side of the price column and aligned with the corresponding bid and ask prices." ('411 Patent, 7:49-53.)
"Mercury also provides an order entry system, market grid, fill window and summary of market orders in one simple window." ('411 Patent, 7:38-40.)

FIG. 3

SYCOM FGBL DEC99						-	□	×
E/W		10:48:44		BidQ	AskQ	Prc	LTQ	
1009		L	3		104	99		
1010		R	5		24	98		
1011		720			33	97		
1012		×	10		115	96		
1013		0			32	95		
1014		10	1H		27	94		
		50	3H		63	93		
1007	S 0 W 24	1K	5H		45	92		
	S 0 W 7	CLR			28	91		
1015		×	10		20	90	10	
1016		17	▽		18	89		
1008	B 0 W 15	CXL		18		88		
	B 0 W 13	+	-	97		87		
1017		NET 0		30		86		
1018	B 0 W 17	NET REAL		43		85		
1019				110		84		
				23		83		
				31		82		
1021				125		81		
				21				

A. Single Action

70. Independent claims 1 and 26 each recite the term “single action”:
“selecting a particular graphical area in the order entry region through a **single action** of a user input device” (’411 patent, 13:12-13, emphasis added.) The specification of the ’411 patent provides an explicit definition for this term: “any action by a user within a short period of time, whether comprising one or more clicks of a mouse button or other input device is considered a **single action** of the user **for the purpose of the present invention.**” (’411 patent, 4:18-22, emphasis added.)

B. Dynamically Displaying

71. Claims 1 and 26 each recite the term “dynamically displaying”:
“**dynamically displaying**, via the computing device, a first indicator representing quantity associated with at least one trade order to buy” The specification does not explicitly define this term. However, the specification explains that a trader can “add or subtract a preset quantity for the quantities outstanding in the market.” (’411 Patent, 10:16-19.) In this case, quantities in the Bid or Ask columns would be updated, but not move. (*See* ’411 Patent, 10:46-54.) The specification also explains that “[t]he values in the Bid and Ask columns . . . are dynamic; that is, they move up and down . . . to reflect the market depth for a given commodity.”

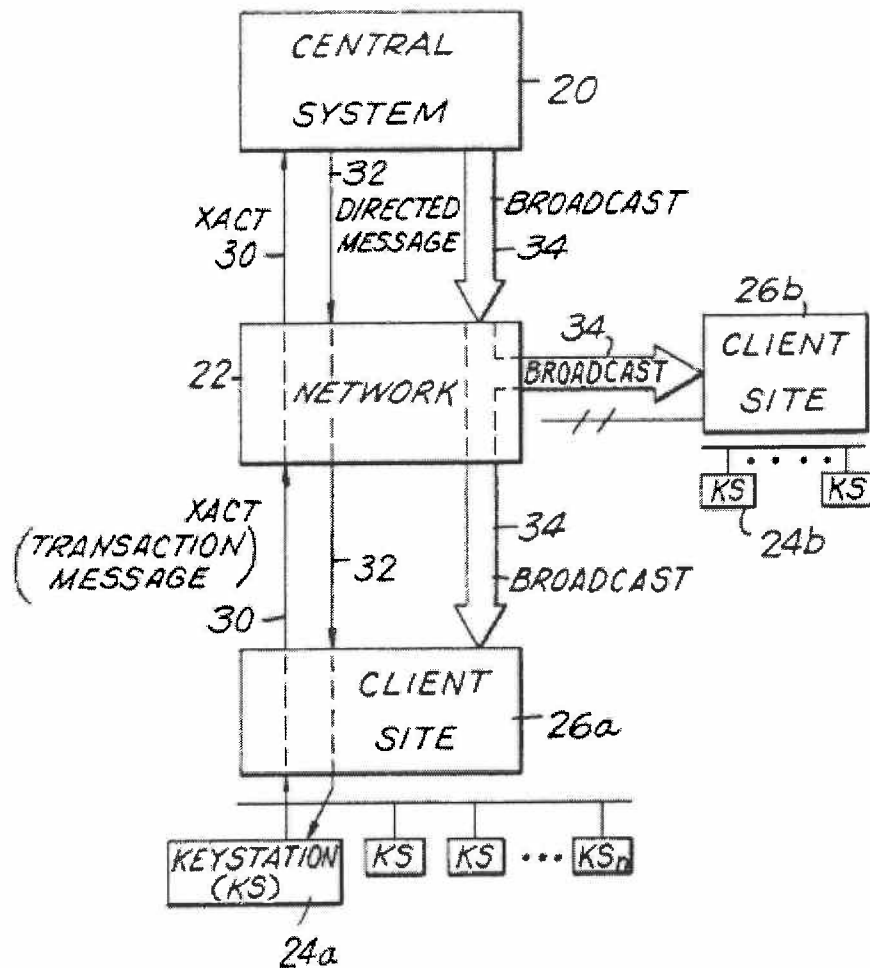
(’411 Patent, 7:66-8:16) Thus, dynamically displaying a field is changing a characteristic (e.g., updating) and/or location (moving) of a displayed field.

VI. SILVERMAN, GUTTERMAN, AND TOGHER

A. Overview

72. Silverman, like the ’411 Patent, is directed to a “computerized exchange” for “trading various trading instruments.” (Silverman, 4:57-5:3.) FIG. 1 of Silverman (reproduced below) depicts a functional block diagram of the trading system of Silverman. As illustrated in FIG. 1, Silverman discloses a host or central system 20. The host system executes trades by matching active bids and offers sent from client sites. (Silverman, 2:65-3:8, 5:7-11, 5:32-46.) The keystations 24, located at the client sites and connected to the central system via a network, are used to transmit bids and offers for the various trading instruments to the central system. (Silverman, 2:65-3:14, 5:20-32.) A keystation 24 is utilized by a trader.

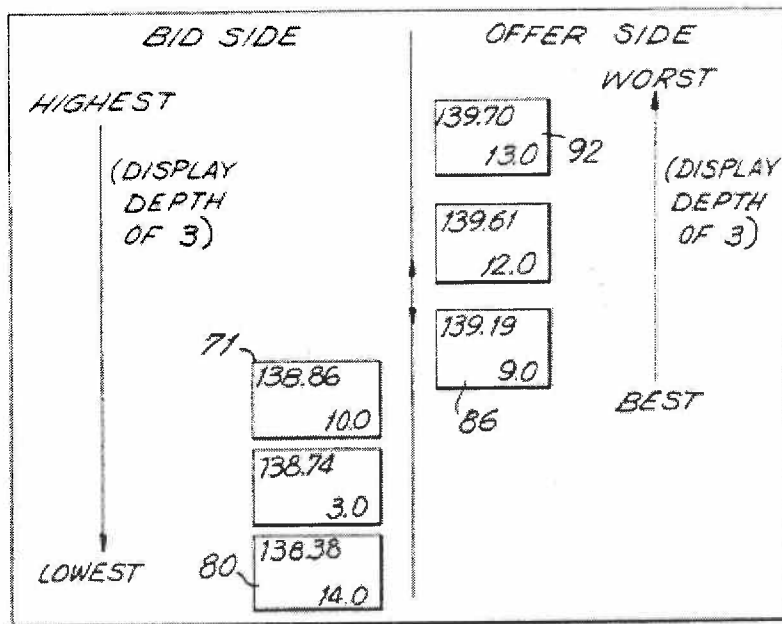
FIG. 1



73. The host system 20 also maintains a “host book data base comprising all of the active bids and offers in the system by trading instrument.” (Silverman, 2:65-3:8) As explained by Silverman, the host book “contains detailed information from each client site on the particulars of each bid or offer.” (Silverman, 8:38-40.) Thus, the host book includes the market depth (the current bid and ask prices and quantities in the market) for a commodity. Similarly, each keystation 24 maintains

a keystation book for each instrument being actively traded. (Silverman, 10:15-25, 10:56-61.) The information used in the keystation book is used “to generate displays at the keystations.” (Silverman, 8:14-18.) FIG. 5 of Silverman (reproduced below with annotations) illustrates a typical keystation book.

FIG. 5
KEYSTATION BOOK

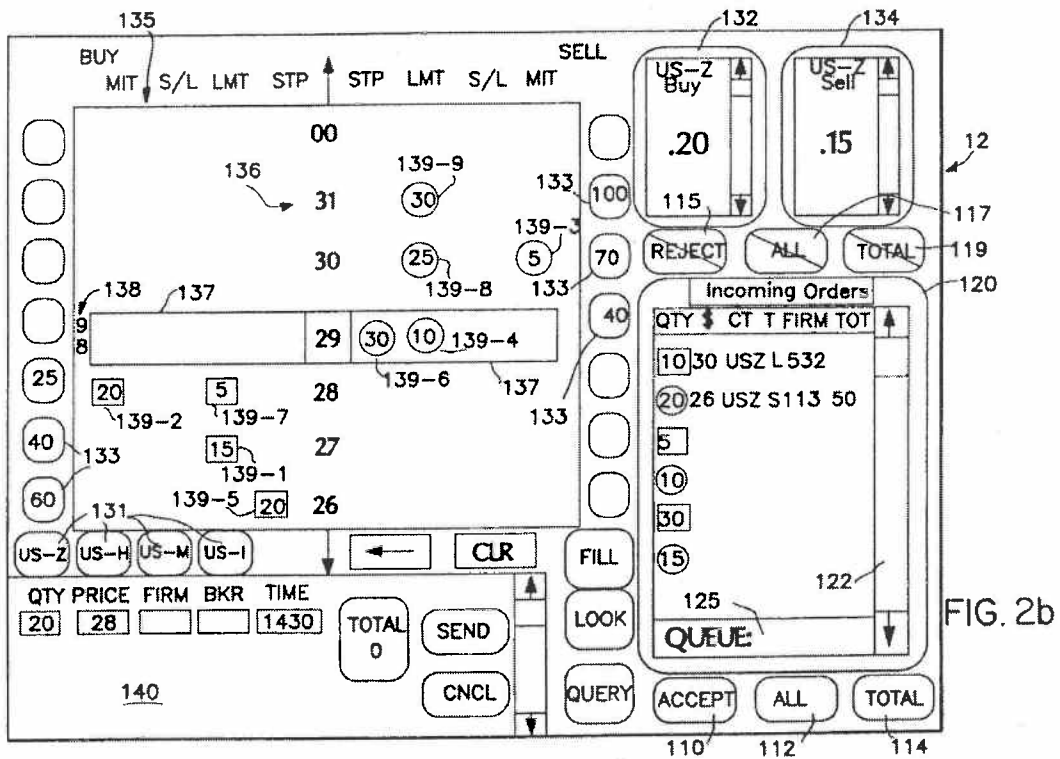


74. The keystation book is “a subset of the system or central station or host book” (Silverman, 8:12-14.) Keystation books are initially received from and continuously updated by the central system 20. (Silverman, 3:46-4:10, 5:7-19, 5:37-49 (“real-time updates”), 7:56-8:61, 10:15-25.) The depth of display for a commodity on a keystation is controlled by the host computer that determines the maximum possible display depth for the keystation book and the keystation which

may further control the information displayed. (Silverman, 8:21-35.) A PHOSITA would recognize that if the keystation can display a subset of the display depth, by definition a subset would include the entire market depth for a commodity on the display.

75. In Silverman, a trader places an order “through data entry using a conventional keyboard, pointing device such as a mouse or any other conventional data entry tool.” (Silverman, 5:29-32.) Silverman does not provide any further details on order entry.

76. Gutterman provides a graphical user interface (“GUI”) displaying order icons representing bids or asks at a specific price level. (Gutterman, FIG. 2b (reproduced below)) “Buy orders [bids] are represented in the deck pane as blue square shapes, and sell orders [asks] are represented as red circles, both of which include indications of the quantities of the orders represented.” (Gutterman, 12:21-24.)



77. Each order icon in Gutterman is “active.” That is, when the user selects the order icon, the system performs one or more actions – such as populating an electronic message with an “order’s quantity, price and timestamp.” (Gutterman, 13:29-33.) A trader may immediately transmit this electronic message to another party by pressing another “active” button – the “SEND FILL” button. (Gutterman, 13:29-43.) (“In periods of heavy market activity....”) As described in the specification of the ’411 patent, any action by a user within a short period of time, whether comprising one or more clicks of a mouse button or other input device qualifies as a “single action.” Under this definition, Gutterman’s disclosure of selecting an order icon corresponds to a single action. And, Gutterman’s

disclosure of a user making two selections (selecting the order icon and the "SEND" button) within a short period of time is a single action.

78. A PHOSITA would have been motivated to use the "active" order icons of Gutterman in the keystation display to permit a trader to place orders. FIG. A edits FIG. 1 of Silverman to add the order icon interface of Gutterman to the keystation display of Silverman.

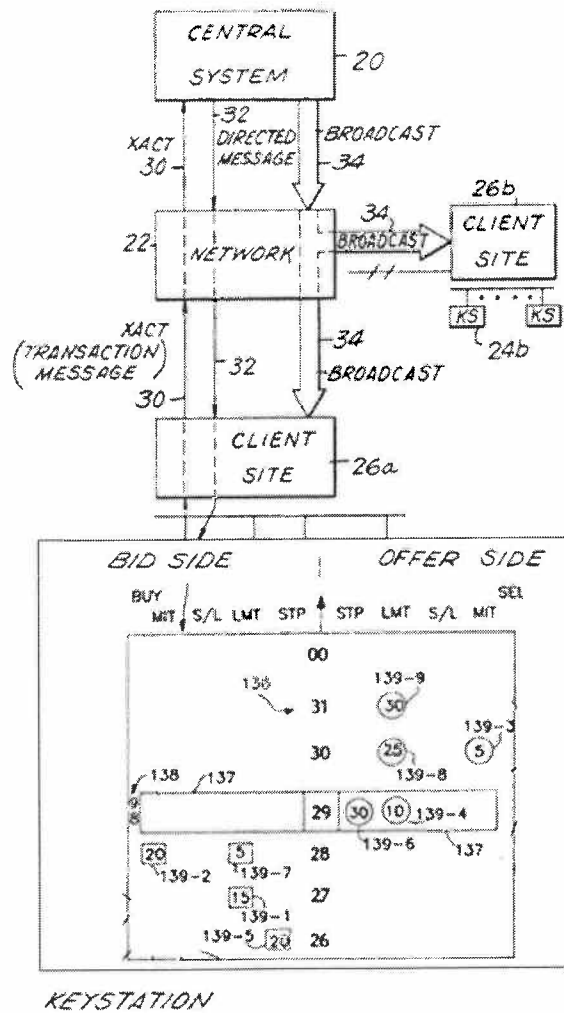


FIGURE A

79. The combination of Silverman and Gutterman fails to disclose selecting an area of the GUI through a single action “to both set a price for the trade order and send the trade order having a default quantity to the electronic exchange.” The use of default values and automatic entry of information (*e.g.*, price) was a well-known technique in the field of GUIs well before the earliest possible priority date of the ‘411 patent. Togher discloses the use of default values in a trading application.

80. Togher discloses an “electronic brokerage system having a communication network connecting traders dealing with financial instruments.” (Togher, 1:7-12.) The “electronic brokerage system facilitat[es] the buying and selling of large blocks of foreign currency by traders.” (Togher, 5:4-9.) Togher discloses that a trader can establish default trade values, such as a default trade quantity, before he/she begins trading: “As shown in FIG. 4, each trader can call up a ‘Trader Profile’ screen 70 ... to establish or modify his personal default values for normal and maximum trading size” (Togher, 12:7-15, FIG. 4; *see also id.*, 8:65-9:10, 11:20-25.) Establishing the default values allows a trader to “quickly and accurately respond to a new Dealable Bid or offer price by merely activating a Buy button 34 or a Sell button 36, respectively on the screen, assuming that the display is touch sensitive or is provided with a ‘mouse’ or other pointing device.” (Togher, 9:1-10; 11:33-41.)

B. The Combination of Silverman, Gutterman, and Togher

81. Silverman discloses a workstation (keystation) used by a market participant (trader) that receives and displays market information. In response to viewing the displayed market information, the market participant uses a conventional data entry tool to instruct the keystation to transmit an electronic message associated with an order.

82. Gutterman also discloses a workstation used by a market participant (broker) that receives and displays market information in selectable regions of a GUI. The selectable regions of the GUI allow a trader to directly interact (using a conventional data entry tool) with the displayed market information to transmit electronic messages associated with an order.

83. It would have been obvious to a PHOSITA to implement Gutterman's GUI on Silverman's keystation for the purpose of order entry for the following reasons. First, both Silverman and Gutterman are in the same field of endeavor (*i.e.*, trading in financial markets) and both describe workstations that display and manage orders in financial markets, including commodity markets.

84. Second, with respect to order entry, the references themselves suggest the combination – Silverman discloses that order entry is “achieved through data entry using a conventional keyboard, pointing device such as a mouse or any other

conventional data entry tool.” (Silverman, 5:25-32.) Gutterman describes order entry using a touch-sensitive display, but explains that a PHOSITA would have understood that the “touch-sensitive screen functions can also be implemented by a conventional keyboard, mouse and other standard input devices.” (Gutterman, 7:31-36, *see also id.*, 12:41-44, 13:27-46.) Accordingly, the mere substitution of one for another or the combination of familiar elements of one with another according to known methods would have yielded predictable results, and thus been obvious to a PHOSITA.

85. Third, Silverman discloses that a trader is motivated to enter orders by observing the displayed market information. Allowing Silverman’s trader to directly interact with the displayed market information, as disclosed by Gutterman, simply merges the two known concepts of observing information and entering instructions.

86. Fourth, it would have been a menial task for a PHOSITA to implement Gutterman’s GUI to send electronic messages as described by Silverman to facilitate trading. After all, Gutterman states: “It will be understood that the organization of order information presented on the screen 12 may be similarly adapted to the needs of stock, bond, stock option and other commodity trading as desired.” (Gutterman, 14:48-51.)

87. Finally, Silverman and Gutterman visualize the market information that is presented to a market participant in the same manner. FIG. 5 of Silverman and FIG. 2b of Gutterman both illustrate bids and offers that are vertically plotted along a price axis. Based on these visual similarities, modifying Silverman's keystation to include the well-known features of Gutterman's GUI would have yielded predictable results.

88. It also would have been obvious to a PHOSITA to use Togher's single-action order entry "to both set a price for the trade order and send the trade order having a default quantity to the electronic exchange." First, the references themselves suggest the combination. Gutterman "allows the broker to manage . . . orders more efficiently and to handle order acceptances, fill reports and cancel confirmations more efficiently." (Gutterman, 6:51-55.) Using Togher's default values allows a trader to "quickly and accurately respond to a new Dealable Bid or offer price by merely activating a Buy button 34 or a Sell button 36, respectively on the screen, assuming that the display is touch sensitive or is provided with a 'mouse' or other pointing device." (Togher, 9:1-6, *see also id.*, 11:33-41.) Thus, increasing efficiency, speed, and accuracy are common themes running throughout Gutterman and Togher, and provide explicit suggestion and motivation for a PHOSITA to combine their teachings.

89. Additionally, the combination would have been nothing more than combining prior art elements according to known methods to yield the predictable and desirable result of reducing the time needed to place an order and reducing the number of errors by reducing the number of operator actions (*e.g.*, keystrokes). (*See* Shneiderman, pp. 82-83 (desirable to reduce number of operator actions such as keystrokes, undesirable to force operator to type in same information twice).) By definition, defaults are standard or preset values that allow a program to function without the user inputting that value. (Microsoft Computer Dictionary, 5th ed. at 150.) And prior to the earliest possible priority date of the '411 Patent, it was a well-known design practice to use default values to improve the user's experience and reduce errors. (*See* Cooper, "About Face 1.0," pp. 142-43 (instead of offering users a blank slate, provide the values and settings the user will probably need).)

90. For at least these reasons, a PHOSITA would have been motivated to incorporate the default values of Togher into the system of Silverman and Gutterman to achieve the predictable results of reducing the time needed to place an order and reducing errors. This is especially true in a user interface for an electronic trading system, where speed may be of the essence. (*See also* Deel, "The Strategic Electronic Day Trader," p. 31 (traders do not want cumbersome system that takes too long to enter the trade).)

91. Further, Togher's entire background section is devoted to describing Silverman's electronic exchange. (Togher, 1:16-2:11.) Togher's endorsement of Silverman's electronic exchange is an explicit suggestion to combine these teachings.

C. Claim 1.

92. Claim 1 is reproduced below. I have labeled the elements of claim 1 for ease of discussion.

1. [P] A method of displaying market information relating to and facilitating trading of a commodity being traded on an electronic exchange, the method comprising:

[A] receiving, by a computing device, market information for a commodity from an electronic exchange, the market information comprising an inside market with a current highest bid price and a current lowest ask price;

[B] displaying, via the computing device, a bid display region comprising a plurality of graphical locations, each graphical location in the bid display region corresponding to a different price level of a plurality of price levels along a price axis;

[C] displaying, via the computing device, an ask display region comprising a plurality of graphical locations, each graphical location in the ask display region corresponding to a different price level of the plurality of price levels along the price axis;

[D] dynamically displaying, via the computing device, a first indicator representing quantity associated with at least one trade order to buy the commodity at the current highest bid price in a first graphical location of the plurality of graphical locations in the bid display region, the first graphical location in the bid display region corresponding to a price level associated with the current highest bid price;

[E] upon receipt of market information comprising a new highest bid price, moving the first indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the bid display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new highest bid price, wherein the second graphical location is different from the first graphical location in the bid display region;

[F] dynamically displaying, via the computing device, a second indicator representing quantity associated with at least one trade order to sell the commodity at the current lowest ask price in a first graphical location of the plurality of graphical locations in the ask display region, the first graphical location in the ask display region corresponding to a price level associated with the current lowest ask price;

[G] upon receipt of market information comprising a new lowest ask price, moving the second indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the ask display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new lowest ask price, wherein the second graphical location is different from the first graphical location in the ask display region;

[H] displaying, via the computing device, an order entry region comprising a plurality of graphical areas for receiving single action commands to set trade order prices and send trade orders, each graphical area corresponding to a different price level along the price axis; and

[I] selecting a particular graphical area in the order entry region through a single action of a user input device to both set a price for a trade order and send the trade order having a default quantity to the electronic exchange.

1. A method of displaying market information ... ([P])

93. The combination of Silverman, Guttermann, and Togher discloses a “*method of displaying market information relating to and facilitating trading of a commodity being traded on an electronic exchange*” as recited in the preamble of claim 1.

94. Silverman discloses a “computerized exchange” for “trading various trading instruments, such as different foreign exchange currencies.” (Silverman, 4:57-5:3.) Because a commodity includes anything that can be traded with quantities and/or prices, Silverman’s “trading instruments” are commodities.

95. Each keystation 24 in Silverman maintains a keystation book for each instrument being actively traded. (Silverman, 10:15-25, 10:56-61.) The information used in the keystation book is used “to generate displays at the keystations.” (Silverman, 8:14-18.) The information in the keystation book is

“*related to trading a commodity.*” The keystation book is “a subset of the system or central station or host book” (Silverman, 8:12-14.) The “host book data base compris[es] all of the active bids and offers in the system by trading instrument” (Silverman, 2:66-3:8.) and, as explained by Silverman, the host book “contains detailed information from each client site on the particulars of each bid or offer.” (Silverman, 8:38-40.) The market information of Silverman further “*facilitate[es] trading of a commodity*”:

Preferably the prices are displayed together with the quantity bid or offered at the specified price so that the trader at the keystation can observe the market activity. By observing the market activity, the trader can decide whether to enter a bid, or enter an offer into the market in an effort to complete a matching transaction.

(Silverman, 5:16-22.)

96. Similarly, Gutterman discloses a workstation “for managing orders in a market for trading commodities, securities, securities options, futures contracts and futures options.” (Gutterman, Abstract.) The GUI of Gutterman displays information related to “*trading of a commodity*” such as price, type of order, and quantity. For example, Gutterman displays a “deck pane” 135 having one or more “order icons” representing orders. (Gutterman, 12:1-13:46.) The order icons are displayed “in positions that are determined by the types and **prices of the orders.**”

(Gutterman, 12:27-29, emphasis added.) As highlighted in FIG. 2b of Gutterman, the type of each order (e.g., bid, ask, market-if-touched (MIT), limit, stop, stop/limit) is determined based on the placement of the order icon on the screen. (See, e.g., Gutterman, 12:25-41.) Additionally, “[b]uy orders [bids] are represented in the deck pane as blue square shapes, and sell orders [asks] are represented as red circles, both of which include indications of the **quantities** of the orders represented.” (Gutterman, 12:21-24, emphasis added.) The GUI of Gutterman also facilitates trading by allowing “the broker to manage . . . orders more efficiently and to handle order acceptances, fill reports and cancel confirmations more efficiently.” (Gutterman, 6:51-55.)

97. When the GUI of Gutterman is utilized to display the active bids and offers of the user keystation of Silverman, the combined GUI of Gutterman and Silverman “*display[s] market information relating to and facilitating trading of a commodity being traded on an electronic exchange.*”

2. receiving, by a computing device, market information for a commodity from an electronic exchange ... ([A])

98. The user’s keystation in Silverman receives “*market information for a commodity from an electronic exchange:*” “The content of each of the keystation books ... is updatable by transaction update broadcast messages received from the host computer through the network.” (Silverman, 3:14-18.) Broadcast messages

include “bid update message[s]” (Silverman, 6:57-61.) and offer update messages. (Silverman, 7:2-8.) FIGs. 1-3 and 6 of Silverman depict this distribution of market information to the keystations by the central system 20.

99. The exchange of Silverman has “*an inside market with a current highest bid price and a current lowest ask price*”: “Preferably in the system of the present invention, **at all times** the system will display the **best inside price** for every instrument traded on the system. The best inside price is preferably defined to be the **highest value bid** and the **lowest value offer** in the system. Preferably the prices are displayed together with the quantity bid or offered at the specified price so that the trader at the keystation can observe the market activity.” (Silverman, 5:12-19, emphasis added.)

3. displaying, via the computing device, a bid [ask] display region ... ([B] & [C])

100. As illustrated in FIG. 5, the keystation book of Silverman is divided into a bid side [bid display region] and an offer side [ask display region]. Like Silverman, the GUI of Gutterman “is organized into a buy side [bid display region] and a sell side [ask display region].” (Gutterman, 12:1-6, FIG. 2b.) FIG. B (below) illustrates the combined GUI of Silverman and Gutterman. As highlighted by FIG. B, the GUI of Silverman and Gutterman discloses “*displaying, via the computing*

device, a bid display region” and “displaying, via the computing device, an ask display region.”

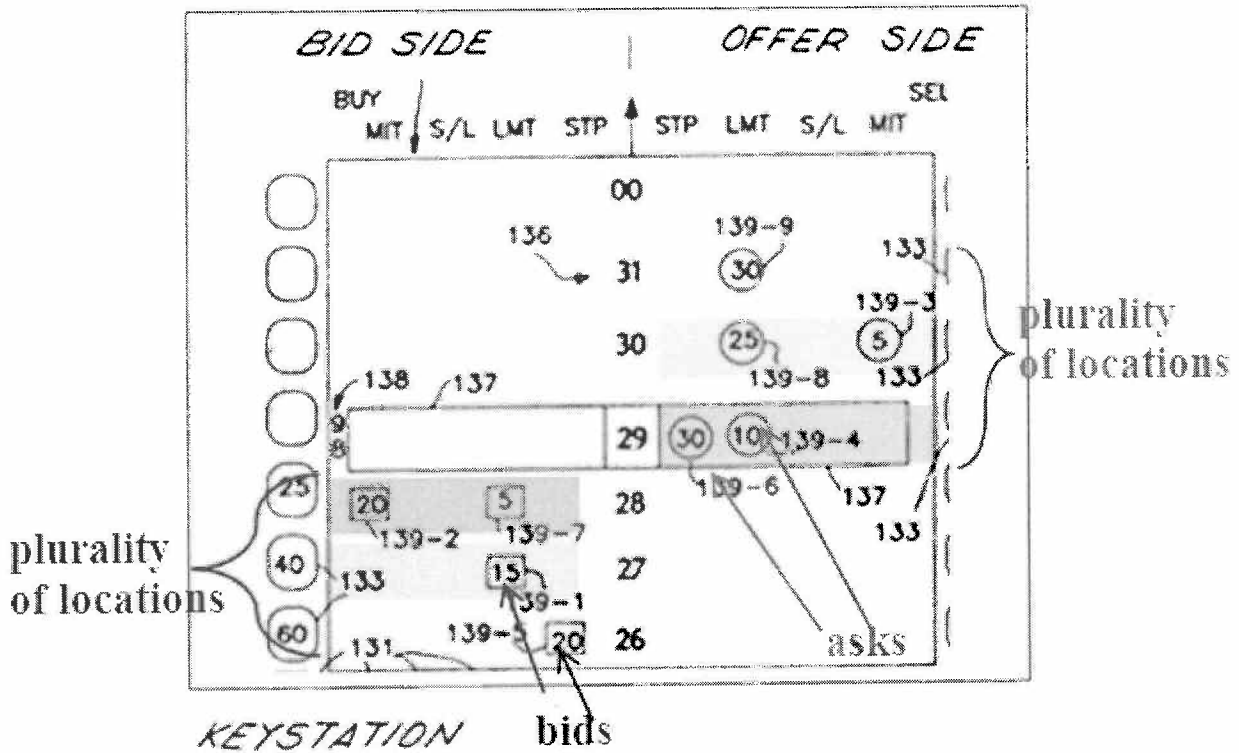


FIGURE B

101. Both the “*bid display region*” and the “*ask display region*” of the GUI of Silverman and Gutterman comprise “*a plurality of graphical locations, each graphical location [in the bid/ask display region] corresponding to a different price level of the plurality of price levels along the price axis.*” The GUI of Gutterman “is organized into a buy side and a sell side and comprises a dividingly positioned column 136 of price ticks, each of which may indicate 1/32 of a dollar (as shown) or another amount as appropriate to the commodity or instrument being

traded.” (Gutterman, 12:1-6.) The price column 136 of Gutterman is a “*price axis*” having a “*plurality of price levels*” (e.g., 1/32 of a dollar). The order icons are displayed “in positions that are determined by the types and **prices of the orders.**” (Gutterman, 12:27-29, emphasis added.)

102. Under the broadest reasonable construction, a “graphical location” is merely a place on the graphical user interface (GUI). As highlighted above in FIG. B, the GUI of Gutterman has multiple “*graphical locations*” containing one or more order icons that “*correspond[] to a different price level of the plurality of price levels along the price axis.*”

4. **dynamically displaying, via the computing device, a first [second] indicator ... ([D] & [F])**

103. As described above, the GUI of Silverman and Gutterman displays “*a first indicator representing quantity associated with at least one trade order to buy the commodity*” and “*a second indicator representing quantity associated with at least one trade order to sell the commodity*”: “Buy orders [bids] are represented in the deck pane as blue square shapes, and sell orders [asks] are represented as red circles, **both of which include indications of the quantities of the orders represented.**” (Gutterman, 12:21-24, emphasis added.)

104. In Gutterman, a market bar “is positioned at the current trade price of the commodity in response to information communicated to the workstation 10 by

the exchange's price reporting system.” (Gutterman, 12:7-12.) It would have been obvious to a PHOSITA to position the market bar of Gutterman at the inside market of Silverman. For example, Silverman explains that best inside price (inside market) is preferably displayed together with the quantity bid or offered at the specified price “so that the trader at the keystation can observe the market activity” and “decide whether to enter a bid, or enter an offer into the market.” (Silverman, 5:16-22.) FIG. B depicts the use of a market bar to highlight the inside market. As highlighted in FIG. B, the GUI displays “*a first indicator ... to buy the commodity at the current highest bid price*” and “*a second indicator ... to sell the commodity at the current lowest ask price.*” As discussed above, and shown in FIG. B, the “*first indicator*” is “*in a first graphical location of the plurality of graphical locations in the bid display region*” and the “*second indicator*” is “*in a first graphical location of the plurality of graphical locations in the ask display region.*”

105. Both the “*first graphical location in the bid display region*” and the “*first graphical location in the ask display region*” of Silverman and Gutterman’s GUI “*correspond[] to a price level associated with the current lowest ask price*”: The order icons correspond to a price of the static display of prices [column 136]. In the example of FIG. B of the Roman Declaration above, “icons 139-1 and 139-7 represent limit buy orders for 15 [bid quantity] at a price of 98 and 27/32 and 5

[bid quantity] at 98 and 28/32, respectively; icon 139-2 represents a M.I.T. buy order for 20 at 98 and 28/32; icon 139-3 represents a M.I.T. sell order for 5 [ask quantity] at 98 and 30/32; icons 139-4, 139-8 and 139-9 represent limit sell orders for 10 [ask quantity] at 98 and 29/32” (Gutterman, 12:29-41.)

106. The display of bids and asks of in the combination GUI of Silverman and Gutterman is “*dynamic*.” The bids and offers in Silverman are updated continuously.⁹ For example, Silverman describes that the “content of each of the keystation books ... is updatable by transaction update broadcast messages received from the host computer through the network.” (Silverman, 3:14-18.) Broadcast messages include “bid update message[s]” (Silverman, 6:58-61) and

⁹ During prosecution of the '132 patent, the Patent Owner acknowledged that “the Silverman et al. references show a plurality of bids and asks for a given traded commodity” that are displayed dynamically “in the sense that the bids and offers are updated.” (Petition to Make Special, Exh. 1013, pp. 4-5.) Patent Owner, however, alleged that Silverman’s “listings of bids and asks [do not] actually *move* along any axis,” which is required to satisfy the “dynamically displaying” limitation. (Petition to Make Special, pp. 4-5.) As described herein, Gutterman discloses the movement of bids/asks along a price axis.

offer update messages. (Silverman, 7:2-8.) Illustrating an example transaction where a trader submits a new bid to the central system, Silverman discloses:

[A] bid update message is broadcast by the central station to all keystations in the system This broadcast message preferably occurs if this new bid was the **new best bid** in the system, or was an **additional quantity** being bid at the best price in the system. Thus, if this new bid is at the highest price or better or higher, then it will result in a bid update broadcast message going out throughout the system.

(Silverman, 6:57-67, emphasis added, reference numbers omitted.)

107. “[T]he same procedure is followed with respect to entry of an offer.”

(Silverman, 7:2-8.)

108. Gutterman discloses that order icons are added to display.

(Gutterman, 10:65-11:3.) Thus, in the combination GUI of Silverman and Gutterman, a new order icon can be added when a broadcast bid update message or a broadcast offer update message is received.

5. upon receipt of market information comprising a new highest bid [lowest ask] price, moving the first [second] indicator ([E] & [G])

109. In the GUI of Silverman and Gutterman, “*upon receipt of market information comprising a new highest bid [lowest ask] price,*” “*the first indicator*” is moved “*relative to the price axis to a second graphical location of the plurality*

of graphical locations in the bid [ask] display region.” The content of each of the keystation books of Silverman “is updatable by transaction update broadcast messages received from the host computer through the network.” (Silverman, 3:14-18.) Furthermore, in Silverman, “**at all times** the system will display the **best inside price** for every instrument traded on the system. The best inside price is preferably defined to be the **highest value bid** and the **lowest value offer** in the system. Preferably the prices are displayed together with the quantity bid or offered at the specified price so that the trader at the keystation can observe the market activity.” (Silverman, 5:12-19, emphasis added.) Therefore, the market information received includes “highest bid price” and “lowest ask price.”

110. FIGs. 4 and 14-18 of Silverman illustrate how bid and offer indicators move relative to each another and to the price axis as new orders (bids and offers) are entered. (Silverman, 14:50-15:31.) Figure C (below) annotates FIGs. 4, 17, and 18 of Silverman to illustrate the mapping of the limitations of claims 1 and 26 to Silverman. In this example, FIG. 4 of Silverman depicts the state of the market a new bid is entered that causes a trade to be executed (Silverman, 15:50-55); FIG. 17 of Silverman depicts a new bid at 139.19 entering the market (Silverman, 15:40-43); and FIG. 18 of Silverman depicts the state of the market after the trade has been executed (Silverman, 15:55-56). As shown, the trade that is executed in

response to the new bid at 139.19 entering the market causes the inside market to shift up in the vertical direction relative to the price axis.

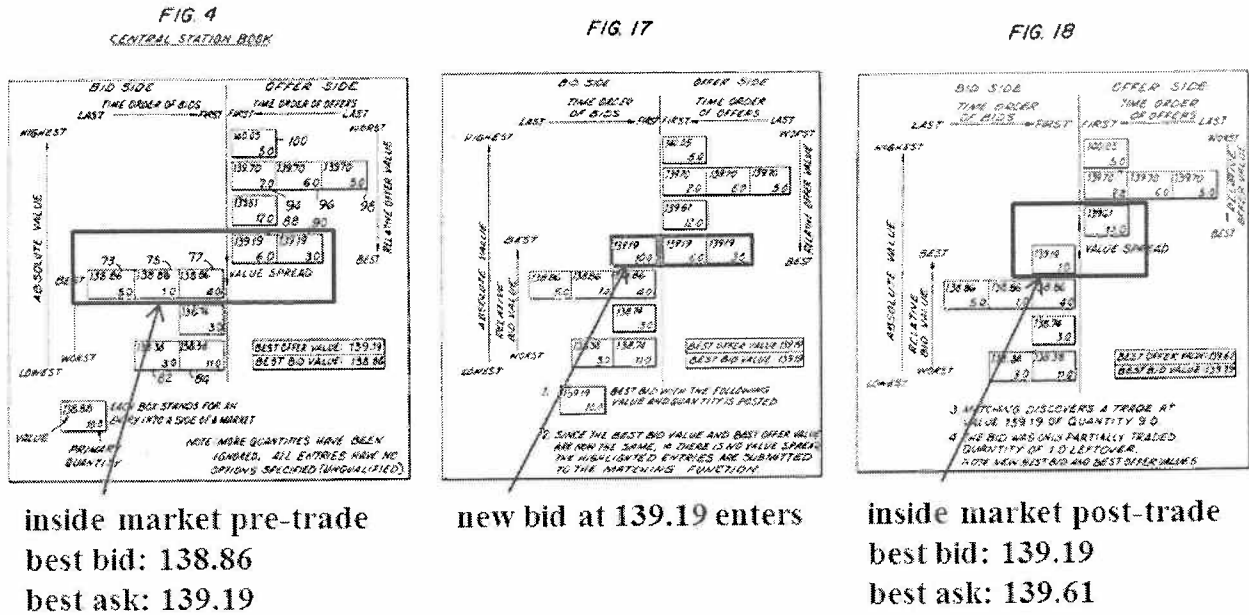


FIGURE C

111. In Gutterman, a market bar “is positioned at the current trade price of the commodity in response to information communicated to the workstation 10 by the exchange's price reporting system.” (Gutterman, 12:7-12.) It would have been obvious to a PHOSITA to position the market bar of Gutterman at the inside market of Silverman. For example, Silverman explains that best inside price (inside market) is preferably displayed together with the quantity bid or offered at the specified price “so that the trader at the keystation can observe the market

activity” and “determine whether to enter a bid, or enter an offer into the market.” (Silverman, 5:16-22.)

112. “The market bar 137 moves up and down along column 136 [price axis] in response to changes in the market price.” (Gutterman, 12:15-17.) Thus, when the market bar of Gutterman is used with the inside market of Silverman “*the first indicator*” [buy order icon associated with the highest bid price] is moved “*to a second graphical location of the plurality of graphical locations in the bid display region*” and this move is “*relative to the price axis.*” Similarly, “*the second indicator*” [sell order icon associated with the lowest ask price] is moved “*to a second graphical location of the plurality of graphical locations in the ask display region*” and this move is “*relative to the price axis.*”

113. The “*second graphical location*” for the first indicator corresponds “*to a price level of the plurality of price levels associated with the new highest bid price*” and the “*second graphical location*” for the second indicator corresponds “*to a price level of the plurality of price levels associated with the new lowest ask price*”: As described above, the order icons correspond to a price of the static display of prices [column 136]. (See, e.g., Gutterman, 12:29-41.) Because the inside market values change, “*the second graphical location is different from the first graphical location in the bid [ask] display region.*”

**6. displaying, via the computing device, an order entry region ...
([H])**

114. The “order icons” displayed in the GUI of Silverman and Gutterman include “*order entry regions ... comprising a plurality of graphical areas for receiving single action commands.*” As explained by Gutterman, “[b]uy orders [bids] are represented in the deck pane as blue square shapes, and sell orders [asks] are represented as red circles, both of which include indications of the quantities of the orders represented.” (Gutterman, 12:21-24.) A user can select an order “by touching the corresponding order icon.” (Gutterman, 13:27-29.) Gutterman’s selectable (*e.g.*, touch-sensitive) display corresponds to an “*order entry region.*” Additionally, “the various keys and touch-sensitive screen functions can also be implemented by a conventional keyboard, **mouse** and other standard input devices.” (Gutterman, 7:31-36, emphasis added.) Thus, each order icon includes “*graphical areas for receiving single action commands*”¹⁰ such as the selection by touch screen and/or a click or double-click of a mouse.

¹⁰ The term “single action” is any action by a user within a short period of time.

115. Each of the graphical areas of Gutterman correspond to a different price level along the price axis – *e.g.*, the 1st and 2nd graphical areas on the buy side correspond to price levels of 98 & 28/32 and 98 & 27/32, respectively. Thus, in Gutterman “*each graphical area corresponding to a different price level along the price axis.*”

116. Silverman discloses that traders enter orders using conventional input devices based on observing the displayed market information. (Silverman, 5:20-32, 12:64-13:4.) Further, each order icon in Gutterman is “active.” That is, when the user selects the order icon, the system performs one or more actions – such as populating an electronic message with an “order’s quantity, price and timestamp.” (Silverman, 13:29-31.) As described in further detail below, a PHOSITA would have been motivated to use the “active” order icons of Gutterman in the keystation display of Silverman to permit a trader to place orders.

117. However, the combination of Silverman and Gutterman does not explicitly disclose a single action “*to both set a price for the trade order and send the trade order having a default quantity to the electronic exchange.*” However, Togher discloses this limitation.

118. Togher discloses setting default values for trade orders: “As shown in FIG. 4, each trader can call up a ‘Trader Profile’ screen 70 ... to establish or

modify his personal default values for normal and maximum trading size” (Togher, 12:7-18, FIG. 4; *see also* Togher, 8:65-9:10, 11:20-25.) Setting default values allows a trader to “quickly and accurately respond to a new Dealable Bid or offer price by merely activating a Buy button 34 or a Sell button 36, respectively on the screen, assuming that the display is touch sensitive or is provided with a ‘mouse’ or other pointing device.” (Togher, 9:1-6; *see also* Togher, 11:33-41.) A PHOSITA would have understood that a trader using Togher’s GUI could select a particular location of Togher’s GUI (*e.g.*, “Buy” or “Sell” button) via a single action of a conventional user input device (*e.g.*, touch-sensitive display, mouse) to establish a trade price and type of order (*e.g.*, the “new Dealable Bid or offer price”), set default values (*e.g.*, quantity), and send the order to market.

7. selecting a particular graphical area in the order entry region through a single action of a user input device (I) ...

119. As described above, in the GUI of Silverman and Gutterman, a user can “*select[] a particular graphical area in the order entry region*” “by touching the corresponding order icon.” (Gutterman, 13:27-29.) The touching of the corresponding order icon is “*a single action of the user input device.*” When a mouse is utilized, the single action of the user input device in this embodiment of Gutterman would be a single or double mouse click.

120. Gutterman discloses that selecting (*e.g.*, touching) an order icon sets “the order’s quantity, price, and timestamp.” (Gutterman, 13:29-31.)

121. Togher discloses the use of default quantities: “As shown in FIG. 4, each trader can call up a ‘Trader Profile’ screen 70 ... to establish or modify his personal default values for normal and maximum trading size” (Togher, 12:7-18, FIG. 4 (reproduced in-part below); *see also* Topher, 8:65-9:10, 11:20-25.) The “Trader Profile” allows a trader to establish the default quantity value labeled 30 and 32 in FIG. 2 and 49 and 50 of FIG. 3 of Togher.

Fig. 4

			70
Dealable Price Display (select one)	80	Regular Priority	Best Dealable
Currency Trading Pair	xxx/xxx	72	82
Normal Trade Size	nnn	74	
Maximum Trade Size	nnn	76	78

122. Thus, when an order icon is selected on the GUI, a trade order is sent to the electronic exchange “*having a default quantity.*”

8. Claim 2.

123. As explained by Gutterman, “[b]uy orders [bids] are represented in the deck pane as blue square shapes, and sell orders [asks] are represented as red circles, both of which include indications of the quantities of the orders represented.” (Gutterman, 12:21-24.) Gutterman’s selectable display corresponds to an “*order entry region.*” As illustrated in FIG. 5, the keystation book of

Silverman is divided into a bid side [bid display region] and an offer side [ask display region]. Like Silverman, the GUI of Gutterman “is organized into a buy side [bid display region] and a sell side [ask display region].” (*Id.*, 12:1-6.) The order icons are displayed “in positions that are determined **by the types and prices of the orders.**” (Gutterman, 12:27-29.) (emphasis added) Thus, the “*order entry region*” is also split into “*a bid order entry region*” and an “*ask order entry region.*”

124. Each order icon in Gutterman is “active.” A user can select an order “by touching the corresponding order icon.” (*Id.*, 13:27-29.) Additionally, “the various keys and touch-sensitive screen functions can also be implemented by a conventional keyboard, **mouse** and other standard input devices.” (*Id.*, 7:31-36 (emphasis added).) Thus, the both the “*bid order entry region*” and the “*ask order entry region*” include “*a plurality of graphical locations for receiving single action commands*” such as the selection by touch screen and/or a click or double-click of a mouse.

125. Each of the “*plurality of graphical areas*” of Gutterman corresponds “*to a different price level of the plurality of price levels along the price axis.*” Order icons are arranged along a price “column 136” as illustrated in Gutterman.

Additionally, the order icons correspond to a price of the static display of prices [column 136]. (See, e.g., Gutterman, 12:29-41.)

126. As illustrated in my FIG. B (above), Gutterman's selectable display (which corresponds to an order entry region) includes a "bid order entry region" (left of the "price axis") and an "ask order entry region" (right of the "price axis"). FIG. C illustrates three example graphical areas in the portion of Gutterman's display that corresponds to the claimed "bid order entry region." Each of these three graphical areas correspond to a different price level along the price axis – e.g., the 1st, 2nd, and 3rd graphical areas correspond to a price levels of 98 & 28/32, 98 & 27/32, and 98 & 26/32, respectively. The 1st graphical area (buy side) includes the bid order icons 139-2 and 139-7; the 2nd graphical area includes the bid order icon 139-1; and the 3rd graphical area includes the bid order icon 139-5.

127. FIG. B (above) also illustrates example three graphical areas in the portion of Gutterman's display that corresponds to the claimed "ask order entry region." Each of these three graphical areas correspond to a different price level along the price axis – e.g., the 1st, 2nd, and 3rd graphical areas correspond to price levels of 98 & 29/32, 98 & 30/32, and 98 & 31/32, respectively. The 1st graphical area (sell side) includes the offer order icons 139-6 and 139-4; the 2nd graphical

area includes the bid order icon 139-8; and the 3rd graphical area includes the bid order icon 139-9.

9. Claim 3.

128. The combination of Silverman, Gutterman and Togher discloses “*wherein the single action further sets whether the trade order is an order to buy or sell the commodity.*” As described above, orders in the GUI of Silverman and Gutterman are represented by “order icons.” (Gutterman, 12:1-13:46.) “Buy orders [bids] are represented in the deck pane as blue square shapes, and sell orders [asks] are represented as red circles, both of which include indications of the quantities of the orders represented.” (Gutterman, 12:21-24.) In Gutterman, “each order icon 139 is advantageously a touch-sensitive area.” (Gutterman, 12:41-44.) The user “selects the order by touching the corresponding [blue square or red circle] order icon in the deck pane 135” in a corresponding buy or sell display region. (Gutterman, 13:27-29.) That is, if the position of the pointer of the user input device [the user touching the touch screen] is the blue square [bid order entry region], the order is a buy order; and if the position of the pointer of the user input device [the user touching the touch screen] is the red square [ask order entry region], the order is a sell order.

10. Claim 4.

129. In the GUI of Silverman and Gutterman, “*the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.*” As discussed above, the order icons of Gutterman are placed in a corresponding a bid display region or a sell display region. Thus, the bid order entry region (bid order icon) overlaps with the bid display region and the ask order entry region (ask order icon) overlaps with the ask display region. Additionally, a PHOSITA would have understood that a defining characteristic of a touch-sensitive display used in Gutterman is that the display region and the entry (input) region overlap.

11. Claim 5.

130. In Gutterman, each order icon is a selectable area. (Gutterman, 12:42-43.) The user “selects the order by touching the corresponding [blue square or red circle] order icon in the deck pane 135” in a corresponding buy or sell display region. (Gutterman, 13:27-29.) Gutterman further discloses that “It will be understood by those of ordinary skill in the art ... that the various keys and touch-sensitive screen functions can also be implemented by a conventional keyboard, **mouse** and other standard input devices.” (Gutterman, 7:31-36, emphasis added.) It was well-known prior to the earliest possible priority date of the ’411 patent that a “cursor is the visible representation on the screen of the mouse’s position.”

(Cooper, “About Face 1.0,” p. 208.) It was further well-known that a “user moves the mouse until its corresponding on-screen cursor is pointing to, or placed over, the desired object.” (Cooper, “About Face 1.0,” p. 203.)

12. Claim 6.

131. In Gutterman, the user “selects the order by touching the corresponding [blue square or red circle] order icon in the deck pane 135” in a corresponding buy or sell display region. (Gutterman, 13:27-29.) Therefore, if the position of the pointer of the cursor is the blue square [bid order entry region], the order is a buy order; and if the position of the cursor is the red square [ask order entry region], the order is a sell order.

13. Claims 7 and 8.

132. As discussed above relative to claim limitations [1I] and [26I], Togher discloses a “*trade order having a default quantity.*” A PHOSITA would have understood that the default value could have been applied to a single order, *e.g.*, by activating the “Buy” or “Sell” button one time. Therefore, Togher further discloses “*wherein the default quantity is designated to be used for a single trade order.*”

133. A PHOSITA would have understood that Togher's GUI allowed a user to place a plurality of trades. The “*default quantity*” of Togher can be repeatedly used when a trader is placing a trade order – that is, for a plurality of serial trade

orders. Indeed, the purpose of default value is to provide a value when a specific condition or conditions occurs. Togher therefore discloses “*wherein the default quantity is designated to be used for a plurality of trade orders.*” In my personal observation of day traders for the *Tradescape* engagement, the ability to use default quantities for a plurality of trade orders was a well-known concept in this field.

14. Claim 12.

134. Claim 12 recites “*the bid display region, the ask display region, and the order entry region are displayed vertically or horizontally.*” As illustrated in FIG. 2b of Gutterman and FIG. B (above), the bid display region, the ask display region, and the order entry region are displayed vertically.

15. Claim 13.

135. Claim 13 recites “*the bid and ask display regions are displayed separately.*” As illustrated in FIG. B (above), the GUI of Silverman and Gutterman has a “bid side” on the left of the price axis and an “offer side” on the right of the price axis. That is, the bid and ask regions are displayed separately.

16. Claim 14.

136. In the GUI of Silverman and Gutterman, “*the plurality of price levels are displayed along the price axis*”: The GUI of Gutterman “is organized into a

buy side and a sell side and comprises a dividingly positioned column 136 of price ticks, each of which may indicate 1/32 of a dollar (as shown) or another amount as appropriate to the commodity or instrument being traded.” (Gutterman, 12:1-6.)

17. Claim 15.

137. Gutterman discloses or renders obvious “wherein the plurality of price levels do not move except as a result of a manual repositioning command.”

Gutterman discloses that the price axis is manually scrolled using “touch-sensitive up and down arrows.” (Gutterman, 12:56-13:4.) Absent the manual scrolling by the user, the price levels of Gutterman remain fixed (do not move).

18. Claim 16.

138. Togher discloses “*receiving an input from a user that designates the default quantity to be used for a plurality of trade orders*”: Togher discloses that in preparation for interacting with order entry displays, “each trader can call up a ‘Trader Profile’ screen . . . to establish or modify his personal default values for normal and maximum trading size” (Togher, 12:7-18, 8:65-9:10.)

139. Togher further discloses “*receiving a plurality of consecutive single action commands from a user input device, each single action command sending a trade order to the electronic exchange, each trade order having an order quantity based on the default quantity without the user designating the default quantity*”

between the single action commands.” In Togher, a trader selects a button (*e.g.*, “Sell 34,” “Buy 36”) through a single action of a user input device to set a price of a trade and send the trade order using the default quantity. (Togher, 8:65-9:10, 11:33-41.) A PHOSITA would have understood that a trader using Togher’s system could select one or more of the buttons more than once to send multiple orders having the default quantity.

19. Claim 17.

140. Togher discloses “*wherein the plurality of trade orders comprises a combination of trade orders to buy and sell the commodity.*” A PHOSITA would have understood that a trader using the combined system of Silverman, Gutterman, and Togher could select a combination of the “Sell 36,” “Buy 34,” “Send 52,” “Bid 54,” “Offer 56” and “Off 60” buttons to send multiple orders having the default quantity.

20. The combination of Silverman, Gutterman, and Togher renders claim 18, 20, 24, and 27 obvious.

141. As described above, in the GUI of Silverman and Gutterman, a user can select an order “by touching the corresponding order icon.” (Gutterman, 13:27-29.) Additionally, Gutterman discloses that “the touch-sensitive screen functions can also be implemented by a conventional keyboard, mouse and other standard input devices.” (Gutterman, 7:31-36.) A “single click” action using a

conventional mouse was well known mouse action at the time of the invention. Therefore, it would have been obvious to a person of ordinary skill in the art that “*the single action of the user input device*” [mouse input device of Gutterman] would “*consists of a single click of the user input device.*”

21. The combination of Silverman, Gutterman, and Togher renders claim 19, 21, 25, and 28 obvious.

142. As described above, in the GUI of Silverman and Gutterman, a user can select an order “by touching the corresponding order icon.” (Gutterman, 13:27-29.) Additionally, Gutterman discloses that “the touch-sensitive screen functions can also be implemented by a conventional keyboard, mouse and other standard input devices.” (Gutterman, 7:31-36.) A “double click” action using a conventional mouse was well known mouse action at the time of the invention. Therefore, it would have been obvious to a person of ordinary skill in the art that “*the single action of the user input device*” [mouse input device of Gutterman] would “*consists of a double-click of the user input device.*”

22. Claim 26.

143. Claim 26 is reproduced below. I have labeled each element of the claim for ease of discussion.

26. [P] A computer readable medium having stored therein instructions for execution by a computer to perform the following method steps:

[A] receiving, by a computing device, market information for a commodity from an electronic exchange, the market information comprising an inside market with a current highest bid price and a current lowest ask price;

[B] displaying, via the computing device, a bid display region comprising a plurality of graphical locations, each graphical location in the bid display region corresponding to a different price level of a plurality of price levels along a price axis;

[C] displaying, via the computing device, an ask display region comprising a plurality of graphical locations, each graphical location in the ask display region corresponding to a different price level of the plurality of price levels along the price axis;

[D] dynamically displaying, via the computing device, a first indicator representing quantity associated with at least one trade order to buy the commodity at the current highest bid price in a first graphical location of the plurality of graphical locations in the bid display region, the first graphical location in the bid display region corresponding to a price level associated with the current highest bid price;

[E] upon receipt of market information comprising a new highest bid price, moving the first indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the bid display region, the second graphical location corresponding to a price level of the

plurality of price levels associated with the new highest bid price, wherein the second graphical location is different from the first graphical location in the bid display region;

[F] dynamically displaying, via the computing device, a second indicator representing quantity associated with at least one trade order to sell the commodity at the current lowest ask price in a first graphical location of the plurality of graphical locations in the ask display region, the first graphical location in the ask display region corresponding to a price level associated with the current lowest ask price;

[G] upon receipt of market information comprising a new lowest ask price, moving the second indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the ask display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new lowest ask price, wherein the second graphical location is different from the first graphical location in the ask display region;

[H] displaying, via the computing device, an order entry region comprising a plurality of graphical areas for receiving single action commands to set trade order prices and send trade orders, each graphical area corresponding to a different price level along the price axis; and

[I] selecting a particular graphical area in the order entry region through a single action of a user input device to both set a price for a trade order and send the trade order having a default quantity to the electronic exchange..

144. I note that limitations [A] through [I] of claim 26 are identical to limitations [A] through [I] of claim 1. I have addressed these limitations above relative to claim 1. In addition, I note the preamble of claim 27 differs from claim 1 only in that claim 26 is directed to a “computer readable medium having program code recorded thereon for execution on a computer to perform the following method steps.”

145. Silverman, Gutterman and Togher each utilize software in their systems and thus would include a “computer readable medium having program code recorded thereon.” For example, Silverman describes a “computerized exchange.” (Silverman, 4:68.) The user workstation of Gutterman is designed using “ACTION! software development tool kit.” (Gutterman, 9:32-33, 10:10, 10:25-26.) Togher also discloses a “computerized system” that is an “electronic brokerage system having a communication network connecting traders dealing in financial instruments.” (Togher, 1:13-15.)

VII. SILVERMAN, GUTTERMAN, TOGHER, AND PAAL

A. Claim 11

146. The combination of Silverman, Gutterman, and Togher fail to disclose “*re-centering said prices corresponding to the bids and asks about an inside market price upon receipt of a re-centering instruction.*” However, re-centering

was a well-known GUI technique prior to the earliest possible priority date of the '411 patent. Paal discloses the technique of “re-centering.”

147. Paal teaches re-centering of an active window to display information around a new origin. Paal initiates a display of information when “the cursor function key is active” upon receipt of a re-centering instruction. (Paal, 14:15-19.) That is, a cursor key is active when the “cursor function key or signal generation means in the present embodiment is a button located on the mouse which is pressed down to set the function key active.” (Paal, 5:46-49.) One way to display information when the cursor key is active in Paal is to determine “the new position of the view area 7.” (Paal, 14:34-37.) Paal uses the new position of the viewable area to compute the “viewable portion of the available information.” (Paal, 14:65-67.) For example, “the position of the viewable portion of information (defined by corners (cx,cy) and (dx,dy)) within the information buffer (iw,ih) can be computed corresponding to the position of the view area 7 (defined by (ax,ay) and (bx,by)) within the palette working area 6 (pw,ph) .” (Paal, 15:3-8.) This position “within the information buffer becomes the new origin of the information displayed in the active window.” (Paal, 15:8-10.) Once Paal determines the origin, Paal uses a “well-known techniques (e.g. system calls provided by an operating system window manager) [to re-center] the active window ... to the new data origin 814.”

(Paal, 15:10-13.) The “re-centering causes a new portion of information to be displayed in the active window.” (Paal, 15:13-15.)

148. As discussed above relative to claim 1, the market bar of Gutterman may be positioned at the “inside market.” A PHOSITA would have been motivated to use the inside market (market bar) as the origin for the re-centering technique of Paal. Further, a combination of Gutterman, Togher and Paal would have been obvious to a PHOSITA, because a PHOSITA would have looked at Paal to re-center dynamic data displayed on a computer terminals and workstations, such as those of Gutterman and Togher by way of a re-centering instructions generated by a user input device that manipulates a GUI as taught in Paal, as such a combination would have been nothing more than combining prior art elements according to known methods to yield predictable results.

VIII. THE COMBINATION OF TSE AND TOGHER

A. Overview

149. TSE is a “Futures/Options Trading System” that “handles the trades in the [Bond Futures Market, Bond Future Option Market, Index Futures Market, Index Option Market, and Stock Option Market] with different commodities characteristics.” (TSE, 4-1.) As explained by TSE, “[e]ach of the aforementioned market may have a different price display, and input unit, etc.” (TSE, 4-1.)

150. The system of TSE includes a client computer. (TSE, 1-1.) The client computer “has a number of functions such as various order inputs, resale and buy back/rights, exercise inputs, various inquiry inputs, various work operation instructions, and board information inquiries responding to the information display and the printer control function.” (TSE, 2-5.) “The basic operation of the client is almost equal to that of the Windows personal computer.” (TSE, 3-1.) The client “can be operated by the ‘keyboard’ or ‘mouse’.” (TSE, 2-5.) When using the “mouse”, a “selection can be made by ‘clicking,’ etc..” (TSE, 3-2.)

151. TSE displays information graphical on a screen and thus has a graphical user interface (“GUI”) for displaying market information. One example of the GUI of TSE is the “Board/Quotation” Screen. TSE supports many display options and modes for presenting market information on the Board/Quotation Screen. For example, a user can select from 6 types of display forms that divide the screen to display information for multiple (2, 4 or 6) Security names simultaneously. (TSE, 7-13 to 14.) In addition, quotation information for 11 or 24 Security can be displayed with divided configurations of 2 Security names (11 or 24 quotations) and 3 Security names (11 quotations). (TSE, 7-14.) As highlighted below, the “Board/Quotation” Screen includes Board Screen portion and a Quotation Portion.

<Board>	<Board>
<Board>	<Board>

(TSE, 7-13.)

152. Below is an example of a Board Screen when the divided in 2 form is selected by the trader. The Board Screen includes the ability to turn on scrolling through the scroll buttons labeled (5). A Board Screen “where scrolling is not being performed is called a ‘Basic Board Screen.’” (TSE, 7-25.) TSE refers to a Board Screen having scrolling enabled as a “Scroll Screen.” (See TSE, 7-25.) For purposes of this proceeding, I refer to the Board Screen as having a Basic Board Screen mode and a Scroll Screen mode.

①		②		③		④		⑤		⑥	
01 Nagakuni 012		Base		13296		K13320 (13:17) (2012)		▲ H ▼		Prev/Next	
⑧	10	250	Closing	250	⑥	15					⑩
⑨	Caution		Market	10	1	⑩	0	13291			
	157	1810	OVER					(9:05)			
	2	1	3	13029			H	13320			
	2	4	132	13028				(9:46)			
	4	145	13027				L	13274			
	2	70	13026					(9:10)			
	5	2	29	13025			P	13310			
	1	20	13024					(13:16)			
	1	5	13023 #	⑬			5	(2021)			
			13022				D	+13			
	10		13021				V	42588			
			13020K	⑭			L5	13005			⑮
			13019	17	3			(13:14)			
			13018	47	1		L4	13008			
			13017	5	6			(13:15)			
			13016	36	3		L3	13009			
			13015	44	6	2		(13:15)			
			13014	46	2		L2	13008			
			13013	123	5			(13:16)			
			13012	141	3		L1	13009			
			13011	2	4			(13:16)			
			13010	817	3		W	5			⑯
			UNDER	6084	109						

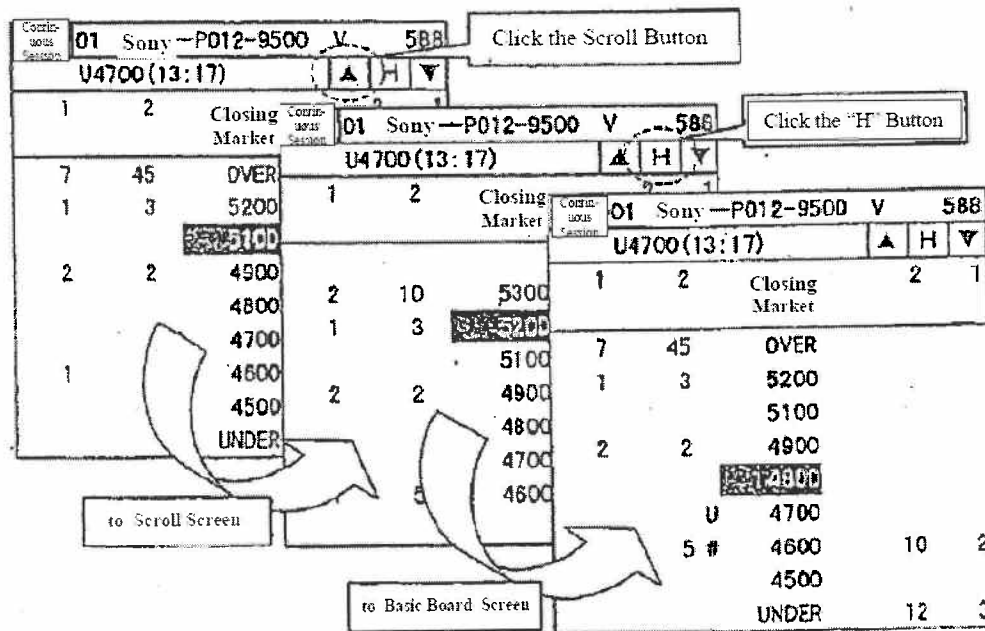
(TSE, 7-17.)

153. When in Basic Board Screen mode, “the board information displayed is updated so that the ‘Board Display Central Price’ is always displayed in the center of the board.” (TSE, 7-25.) When in Scroll Screen mode, “the price display position does not change automatically.” (TSE, 7-25.)

154. A user can transition the Board Screen to Scroll Screen mode by “click[ing] either the [▲] or [▼] scroll button on the board screen with the mouse.” (TSE, 7-26.) When in Scroll Screen mode the “H” is displayed in “Red.” (TSE, 7-20.) A user can transition the Board Screen from Scroll Screen mode to

Basic Board Screen mode by “[c]lick[ing] on the ‘H’ (Home) button on the board screen with your mouse.” (TSE, 7-26.)

<Example of Scrolling Operation>



155. As explained in TSE, when the Board Screen is in Screen Scroll mode, “click[ing] either the [▲] or [▼] scroll button on the board screen with the mouse” moves (scrolls) the screen ‘1 Price’ at a time each time the mouse is clicked. (TSE, 7-26.)

156. The system of TSE allows a trader to customize the Board/Quotation Screen based on how they prefer to view the market information while they actively trade. For example, TSE provides menus to allow the trader to select the divide form of the Board/Quotation Screen. (TSE, 7-15.) In addition, the trade

can select either a “non-compressed” price display method or a “compressed” price display method. In the “non-compressed” price display, “[r]egardless of the existence of the orders, etc. at the corresponding price, it is a method to display all prices on the board.” (TSE, 6-3.) In the “compressed” price display, only the price that satisfies a set of requirements is displayed on the board. (TSE, 6-3.)

B. Combination of TSE and Togher

157. A PHOSITA would have found it obvious to add Togher’s user-modifiable default values to TSE’s electronic trading system. The combination would have been nothing more than combining prior art elements according to known methods to yield the predictable and desirable result of reducing the time needed to place an order and reducing the number of errors by reducing the number of operator actions (e.g., keystrokes). (Togher, 8:57-9:10.)(default quantity allows rapid trading)(*see also* Shneiderman, pp. 82-83.)(desirable to reduce number of operator actions such as keystrokes, undesirable to force operator to type in same information twice).

158. By definition, defaults are standard or preset values that allow a program to function without the user inputting that value. (Microsoft Computer Dictionary, 5th ed., 150.) And at the time of the alleged invention, it was a well-known design practice to use default values to improve the user’s experience and reduce errors. (*See* Cooper, “About Face 1.0,” p. 130.)(instead of offering users a

blank slate, provide the values and settings the user will probably need.)

Accordingly, a PHOSITA would have been motivated to incorporate the default values of Togher into TSE to achieve the predictable results of reducing the time needed to place an order and reducing errors. This is especially true in a user interface for an electronic trading system, where speed may be of the essence. (*See* Deel, “The Strategic Electronic Day Trader,” p. 31.) (Traders do not want cumbersome system that takes too long to enter the trade.)

C. Claim 1

159. Claim 1 is reproduced below. I have labeled the elements of claim 1 for ease of discussion.

1. [P] A method of displaying market information relating to and facilitating trading of a commodity being traded on an electronic exchange, the method comprising:

[A] receiving, by a computing device, market information for a commodity from an electronic exchange, the market information comprising an inside market with a current highest bid price and a current lowest ask price;

[B] displaying, via the computing device, a bid display region comprising a plurality of graphical locations, each graphical location in the bid display region corresponding to a different price level of a plurality of price levels along a price axis;

[C] displaying, via the computing device, an ask display region comprising a plurality of graphical locations, each graphical location in the ask display region corresponding to a different price level of the plurality of price levels along the price axis;

[D] dynamically displaying, via the computing device, a first indicator representing quantity associated with at least one trade order to buy the commodity at the current highest bid price in a first graphical location of the plurality of graphical locations in the bid display region, the first graphical location in the bid display region corresponding to a price level associated with the current highest bid price;

[E] upon receipt of market information comprising a new highest bid price, moving the first indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the bid display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new highest bid price, wherein the second graphical location is different from the first graphical location in the bid display region;

[F] dynamically displaying, via the computing device, a second indicator representing quantity associated with at least one trade order to sell the commodity at the current lowest ask price in a first graphical location of the plurality of graphical locations in the ask display region, the first graphical location in the ask display region corresponding to a price level associated with the current lowest ask price;

[G] upon receipt of market information comprising a new lowest ask price, moving the second indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the ask display

region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new lowest ask price, wherein the second graphical location is different from the first graphical location in the ask display region;

[H] displaying, via the computing device, an order entry region comprising a plurality of graphical areas for receiving single action commands to set trade order prices and send trade orders, each graphical area corresponding to a different price level along the price axis; and

[I] selecting a particular graphical area in the order entry region through a single action of a user input device to both set a price for a trade order and send the trade order having a default quantity to the electronic exchange.

In FIG. D below, I annotate the figure from 7-17 of TSE to map the limitations of claim 1 to the depicted Board Screen. As I discussed above, the Board Screen can be in either Basic Board Screen mode or Scroll Screen mode.

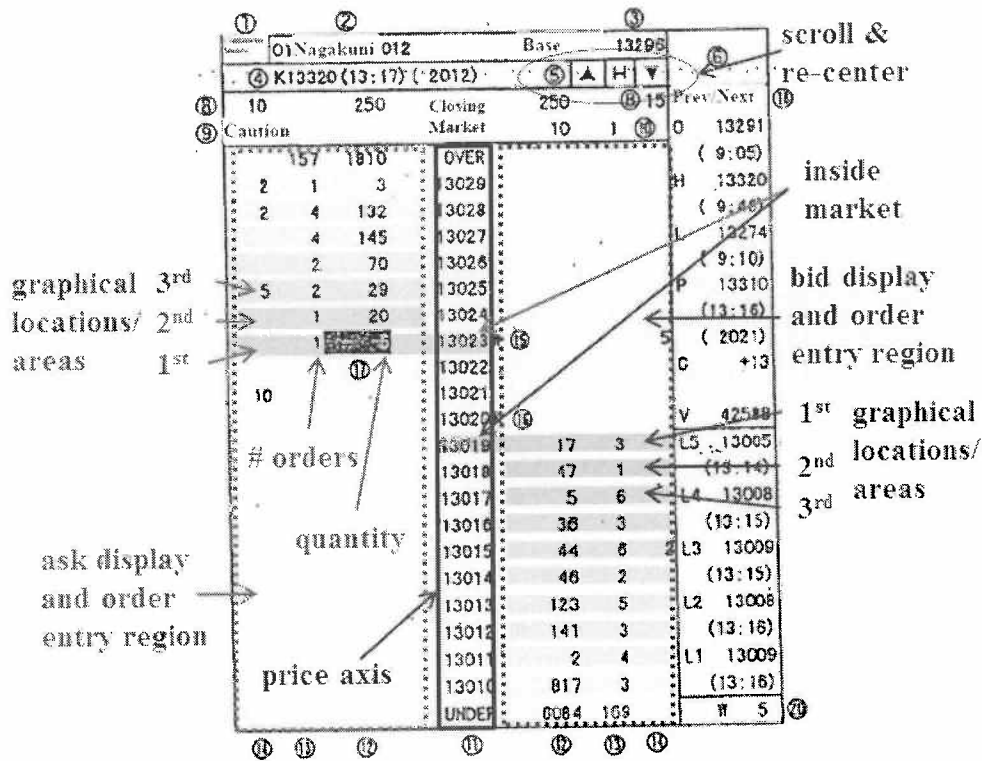


FIGURE D

1. A method of displaying market information ... ([P])

160. TSE discloses a computerized trading method and system that facilitates “trading commodities” by displaying market information to traders via a GUI having a “Board Screen.” (TSE, 4-1, 7-17.) As illustrated in my FIG. D above, the Board Screen present information about a commodity including the Security name, Today’s base unit price, the original share price, Today’s volume, Total Failed Order volume, the order price (market, closing, limit), and order volume. (See TSE, 7-17 to 7-24.)

2. receiving, by a computing device, market information for a commodity from an electronic exchange ... ([A])

161. The system of TSE handles trades in 5 markets including the Bond Futures market, the Index Future market, and the Stock Option market. (TSE, 4-1.) TSE discloses that “the Board/Quotation information is automatically updated at 3 second intervals” with market information, including new bids and offers. (TSE, 7-1, 7-17.) Thus, the client device of TSE receives “*market information for a commodity from an electronic exchange.*”

162. The Board Screen also displays the inside market (highest bid price and lowest ask price) for the commodity. As shown in the example in FIG. D above, the current highest bid price is 13019 with a corresponding order quantity of 17 and the current lowest ask price is 13023 with a corresponding order quantity of 5.

3. displaying, via the computing device, a bid [ask] display region ... ([B] & [C])

163. The Board Screen of TSE includes multiple columns of information. Referring to my FIG. D above, these columns are labeled with a number. The column labeled ⑪ is the “Order Price” column: “This displays the order price (market, closing, limit).” (TSE, 7-21.) The columns labeled ⑫ are the “Order Volume” columns: “This displays the order volume for each order price.” (TSE, 7-

22.) The columns labeled ⑬ are the “Number of Orders” columns: “displays the number of orders.” (TSE, 7-22.)

164. In TSE’s Board Screen, the column labeled ⑪ [Order Price Column] is a price column. (TSE, 7-17, 7-21.) The price column is a price axis having a plurality of price levels. The columns labeled ⑫ [Order Volume Columns] display “the order volume for each order price.” (TSE, 7-22, 7-23.) The columns labeled ⑬ [Number of Orders Column] display “the number of orders.” (TSE, 7-22, 7-23.) Orders to the left of the price column ⑪ are outstanding asks and orders to the right are outstanding bids. As illustrated in my FIG. D, the area to the right of the price column ⑪ corresponds to the “*bid display region*” and the area to the left of the price column ⑪ corresponds to the “*ask display region*.”

165. Each of the bid and ask display regions of TSE comprises “*a plurality of graphical locations ... each graphical location in the [bid/ask] display region corresponding to a different price level of a plurality of price levels along a price axis [price column ⑪].*” In my FIG. D above, I label three exemplary locations (“1st,” 2nd,” and “3rd”) in each of the bid and ask display regions to highlight that each location corresponds to a different price level.

4. dynamically displaying, via the computing device, a first [second] indicator ... ([D] & [F])

166. The columns labeled ⑫ in TSE's Board Screen display "the order volume for each order price" and the columns labeled ⑬ display "the number of orders." (TSE, 7-22.) The Board Screen of TSE displays the highest bid price and quantity (price: 13019; quantity: 17) and the lowest ask price and quantity (price: 13019; quantity: 5). In this depiction, the order quantity of 17 corresponds to the "*first indicator*" and the order quantity of 5 corresponds to the "*second indicator.*" As highlighted in my FIG. D, the "*first indicator*" is "*in a first graphical location of the plurality of graphical locations in the bid display region*" and the "*second indicator*" is "*in a first graphical location of the plurality of graphical locations in the ask display region.*"

167. The display of bids and asks in TSE is "*dynamic.*" Therefore, the display of the "*first indicator*" and "*second indicator*" is also "*dynamic.*" TSE discloses that "the Board/Quotation information is automatically updated at 3 second interval[s]" with market information, including new bids and offers. (TSE, 7-1, 7-17, 7-21.) This occurs when the Board Screen is in both Basic Board Screen mode and Screen Scroll mode.

5. upon receipt of market information comprising a new highest bid [lowest ask] price, moving the first [second] indicator ([E] & [G])

168. TSE discloses that “the Board/Quotation information is automatically updated at 3 second interval[s]” with market information, including new bids and offers. (TSE, 7-1, 7-17, 7-21.) When the Board Screen is in Scroll Screen mode, a market event, such as a change in the inside market, causes the first and second indicators to be displayed at a different location along the common static price axis. That is, the price column stays fixed when the market information changes.

169. My FIG. E below annotates two instances of the figure at 7-17 of TSE to illustrate the movement of the first and second indicators relative to the price axis. In this example, the left Board Screen illustrates the first and second indicators at time T_1 . At time T_2 , a new high bid order at price 13020 and low ask order at price 13022 have entered the market, moving the first indicator to a location corresponding to the new high bid order’s price level and the second indicator to a location corresponding to the new low ask order’s price level along the price column (11). As highlighted in this figure, the move is relative to the price axis.

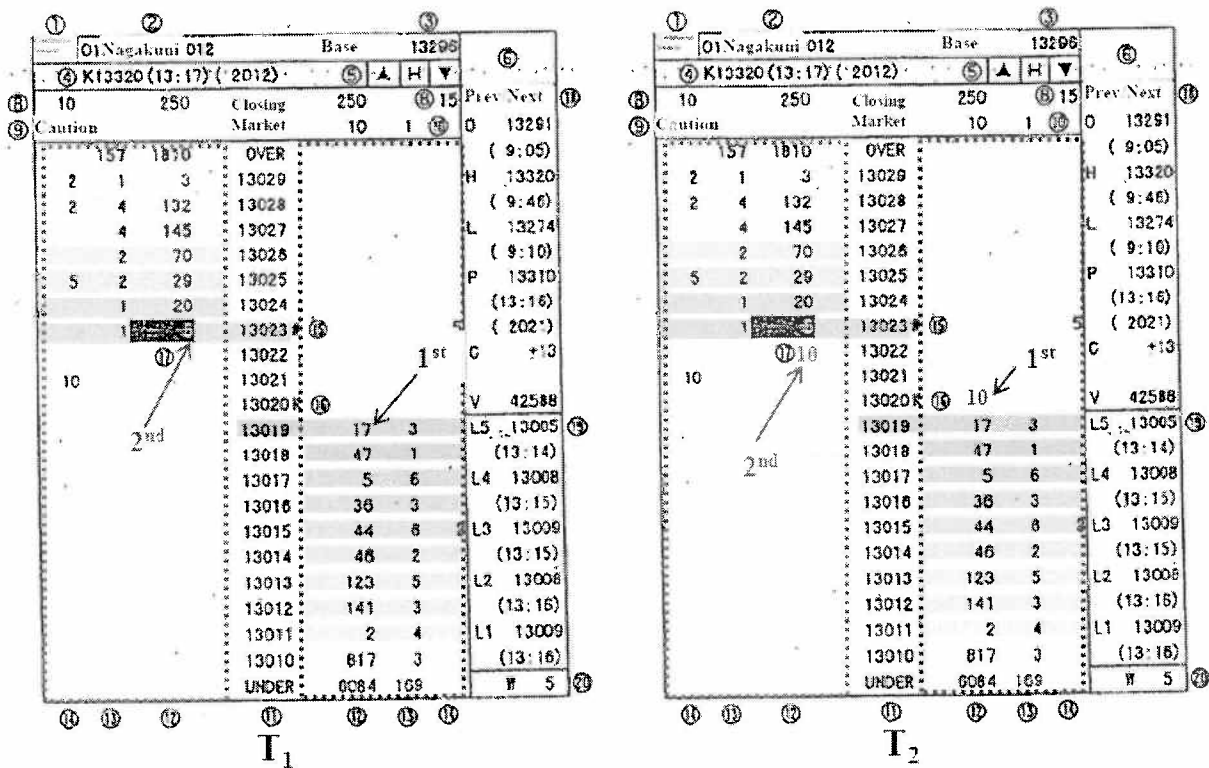


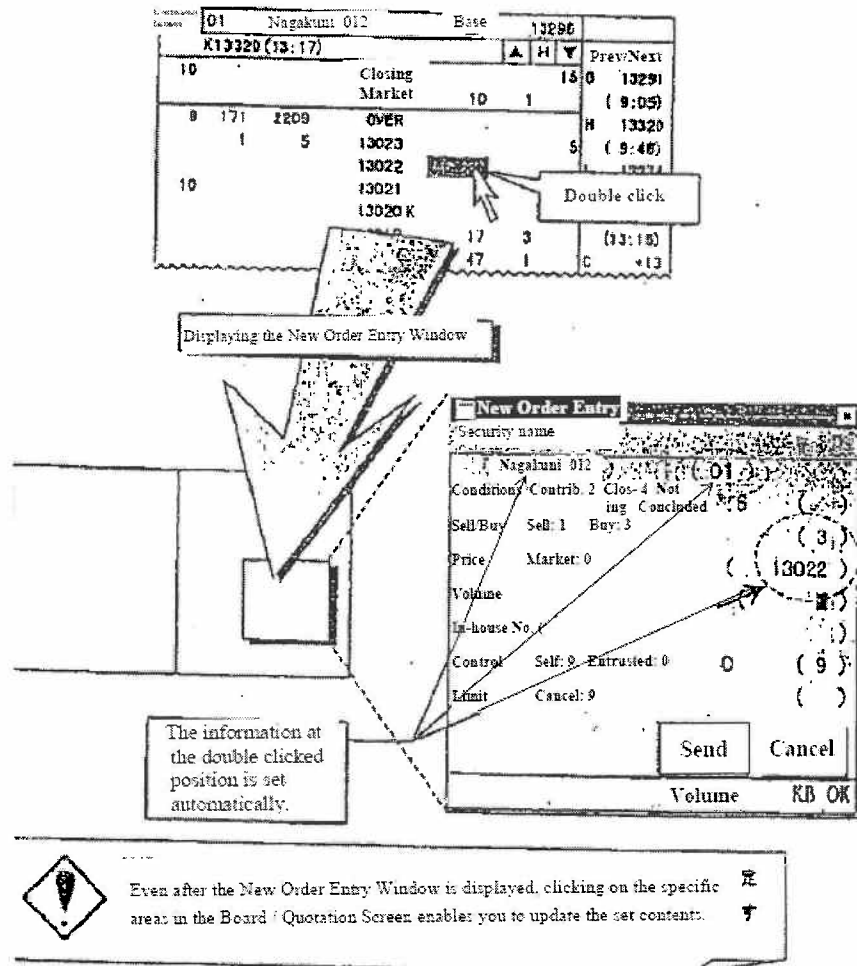
FIGURE E

170. Thus, “the first indicator” is moved “to a second graphical location of the plurality of graphical locations in the bid display region” and this move is “relative to the price axis.” Similarly, “the second indicator is moved “to a second graphical location of the plurality of graphical locations in the ask display region” and this move is “relative to the price axis.” The “second graphical location” for the first indicator corresponds “to a price level of the plurality of price levels associated with the new highest bid price” and the “second graphical location” for the second indicator corresponds “to a price level of the plurality of price levels associated with the new lowest ask price.” Because the inside market values

change, *“the second graphical location is different from the first graphical location in the bid [ask] display region.”*

**6. displaying, via the computing device, an order entry region ...
([H])**

171. A trader can input new orders using the Board Screen of TSE. “By inputting a new order, you can participate in the transactions of the specified Security name.” (TSE, 9-2.) The figure displayed on 9-5 of TSE (reproduced below) illustrates the order entry function. A trader can enter a new order by “[d]ouble click[ing] on a specific area on the Board/Quotation Screen” using an input device such as a mouse. (TSE, 9-5.) The selection of a location in the Board Screen causes a new order entry window to be opened. (TSE, 9-5.) “Depending on the place that is double clicked, the ‘Security Name,’ ‘Sell/Buy Category,’ ‘Order Price,’ or ‘Execution Conditions’ are set automatically” in the new order entry window. (TSE, 9-5; 9-7.) Selecting the send button in the “New Order Entry” window “send[s] the input order contents to the central system.” (TSE, 9-11.)



172. As was well-known by a person of ordinary skill in the art as of the earliest possible priority date of the '304 patent, a cursor is "the visible representation on the screen of the mouse's position." (Cooper, "About Face 1.0," p. 208.) The location or area on a GUI that the cursor is pointing to (e.g., a set of screen pixels" must be made "active" and associated with an action. If not, the location or area is "inert" and clicking the mouse while the cursor is pointing to it provokes no reaction (nothing happens). In the system of TSE, multiple locations (e.g., a location being a cell corresponding to a selected price level row and

column) cause a new order to be created when the user selects them through an action such as double clicking. The Board Screen therefore has an order entry region including these “activated” locations for receiving commands to send trade orders. These locations can be on either the “ask” side of the display (ask order entry region) or on the “buy” side of the display (buy order entry region). These locations as discussed above correspond to a price level along the price column ⑪. I have labeled three such locations (“1st,” “2nd,” and “3rd”) in each of the bid and ask order entry regions in my FIG. D above.

7. selecting a particular graphical area in the order entry region through a single action of a user input device (II) ...

173. As discussed above, a trader can enter a new order by “[d]ouble click[ing] on a specific area on the Board/Quotation Screen” using an input device such as a mouse. (TSE, 9-5.) The selection of a location in the Board Screen causes a new order entry window to be opened. (TSE, 9-5.) Selecting the send button in the “New Order Entry” window “send[s] the input order contents to the central system.” (TSE, 9-11.) The ’411 Patent describes a “single action” broadly: “Rather, any action by a user within a short period of time, whether comprising one or more clicks of a mouse button or other input device, is considered a single action of the user for the purposes of the present invention.” (’411 Patent, 4:19-23.)

The sequence of “double-clicking” followed by the selection of the send button in the new order window can happen in a short period of time.

174. As described above, TSE describes that the action sets a price for the trade order and sends the trade order to the electronic exchange. TSE does not disclose that the trade order has a default quantity. Togher discloses setting default quantities for trade orders: “As shown in FIG. 4, each trader can call up a ‘Trader Profile’ screen 70 ... to establish or modify his personal default values for normal and maximum trading size” (Togher, 12:7-15, FIG. 4.) (reproduced in-part below)(see also *id.*, 8:65-9:10, 11:20-25.) The “Trader Profile” allows a trader to establish the default quantity value labeled 30 and 32 in FIG. 2 and 49 and 50 of FIG. 3 of Togher (reproduced below). (*Id.*)

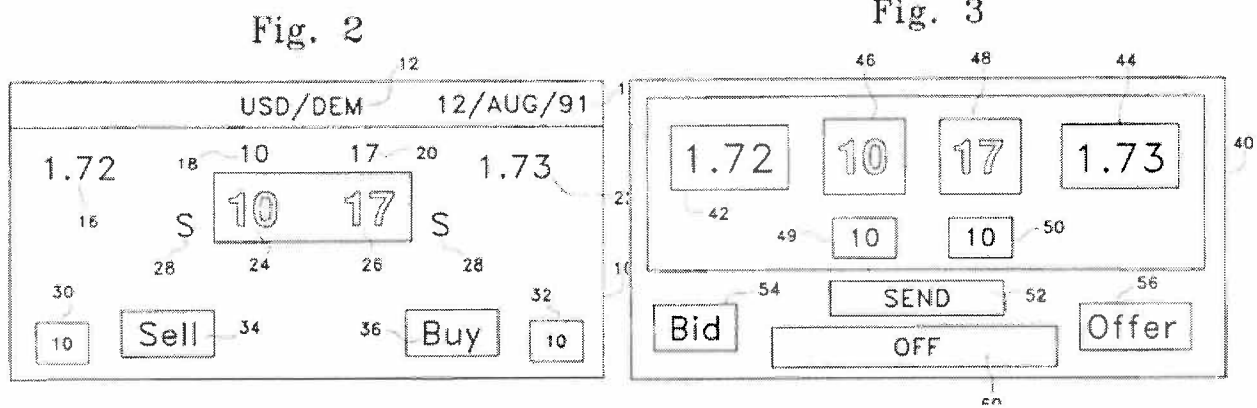


Fig. 4

70

Dealable Price Display (select one)	80	Regular Priority	Best Dealable
Currency Trading Pair	xxx/xxx	72	82
Normal Trade Size	nnn	74	
Maximum Trade Size	nnn	76	78

D. Claim 2.

175. In TSE, as described relative to the figure at 9-5, a trader places a cursor over an area to the right of the price column (11), and selects that area to automatically populate the new order entry window with code “(3)” in the buy/sell field indicating a buy order. (TSE, 9-5.) Thus, the region to the right of the price column (11) corresponds to the “*bid order entry region*.” Placing a cursor over an area to the left of the price column (11) (as depicted in the figure at 7-17 of TSE), and selecting that area, automatically populates a new order entry window with the code “(1)” in the buy/sell field, which indicates a sell or ask order. Thus, the region to the left of the price column (11) corresponds to the “*ask order entry region*.” Both the “*bid order entry region*” and the “*ask order entry region*” include a plurality of graphical areas that each corresponds to a different price level of the plurality of price levels along the price column (11).

E. Claims 3 and 6.

176. “[D]epending on the place that is double clicked, the ... ‘Sell/Buy Category’ [is] set automatically.” (TSE, 9-5.) For example, the category may be set as “(1)” for “buy” and “(3)” for “sell.”

F. Claim 4.

177. As illustrated my FIG. D (annotating the figure at 7-17 of TSE), the bid and ask order entry regions overlap with bid and ask display regions, respectively. (*See also*, TSE, 9-5.)

G. Claim 5.

178. The figure at 9-5 of TSE illustrates the ability to position “a cursor over the first indicator and selecting a graphical area corresponding to the current highest bid [lowest ask] price.” It was well-known prior to the earliest possible priority date of the ’411 patent that a “cursor is the visible representation on the screen of the mouse’s position.” (Cooper, “About Face 1.0,” p. 208.) It was further well-known that a “user moves the mouse until its corresponding on-screen cursor is pointing to, or placed over, the desired object.” (Cooper, “About Face 1.0,” p. 203.)

H. Claims 7 and 8.

179. The default quantity of Togher is used when a trader is placing a trade order – that is a single trade order. Therefore, Togher further discloses “wherein the default quantity is designated to be used for a single trade order.”

180. The “*default quantity*” of Togher can also be repeatedly used when a trader is placing a trade order – that is, for a plurality of serial trade orders. Indeed, the purpose of default value is to provide a value when a specific condition or conditions occurs. Togher therefore discloses “*wherein the default quantity is designated to be used for a plurality of trade orders*” as recited in claim 8.

I. Claim 11

181. TSE discloses “receiving a re-centering command to center the inside market in a window of a graphical user interface.” TSE discloses that “click[ing] either the [▲] or [▼] scroll button on the board screen with the mouse” will transition the Board Screen from the “Basic Board Screen” to the “Scroll Screen.” (TSE, 7-26.) In “the ‘Scroll Screen’ mode, the price display position does not change automatically.” (TSE, 7-26.) “Click[ing] on the ‘H’ (Home) button on the board screen” will “return to the ‘Basic Board Screen’ from the ‘Scroll Screen.’” (TSE, 7-26.) In the “Basic Board Screen,” the “board information and display is updated so that the ‘Board Display Central Price’ **is always displayed in the center of the board.**” (TSE, 7-25.) Selecting the “H”(Home) button is a “re-

centering command” that “centers the inside market in a window of the graphical user interface.”

J. Claim 12.

182. As can be seen in my FIG. D, TSE uses a series of columns to display market information and therefore the “bid display region, the ask display region and the order entry region” of TSE “are oriented vertically.”

K. Claim 13.

183. In the combination GUI of Silverman and Gutterman, “the bid and ask display regions are displayed separately.” As illustrated in FIG. B above, the GUI of Silverman and Gutterman has a “bid side” on the left of the price axis and an “offer side” on the right of the price axis. That is, the bid and ask regions are displayed separately.

L. Claim 14.

184. The price column ⑪ of TSE (price axis) of the Board Screen displays multiple price levels.

M. Claim 15.

185. When the Board Screen is “in the ‘Scroll Screen,’ the price display position does not change automatically.” (TSE, 7-25.) In Screen Scroll mode, “click[ing] either the [▲] or [▼] scroll button on the board screen with the mouse”

moves (scrolls) the screen ‘1 Price’ at a time each time the mouse is clicked. (TSE, 7-26.) Thus, when the Board Screen is in Scroll Screen mode, the plurality of price levels remain fixed unless the user manually scrolls the screen (manual repositioning command).

N. Claim 16.

186. Togher discloses “*receiving an input from a user that designates the default quantity to be used for a plurality of trade orders*”: Togher discloses that in preparation for interacting with order entry displays, “each trader can call up a ‘Trader Profile’ screen . . . to establish or modify his personal default values for normal and maximum trading size” (Togher, 12:7-18, 8:65-9:10.)

187. Togher further discloses “*receiving a plurality of consecutive single action commands from a user input device, each single action command sending a trade order to the electronic exchange, each trade order having an order quantity based on the default quantity without the user designating the default quantity between the single action commands.*” In Togher, a trader selects a button (*e.g.*, “Sell 36,” “Buy 34”) through a single action of a user input device to set a price of a trade and send the trade order using the default quantity. (Togher, 8:65-9:10, 11:33-41.) A PHOSITA would have understood that a trader using Togher’s system could select one or more of the buttons more than once to send multiple orders having the default quantity.

O. Claim 17.

188. Togher discloses “*wherein the plurality of trade orders comprises a combination of trade orders to buy and sell the commodity.*” A PHOSITA would have understood that a trader using the combined system of Silverman, Gutterman, and Togher could select a combination of the “Sell 36,” “Buy 34,” “Send 52,” “Bid 54,” “Offer 56” and “Off 60” buttons to send multiple orders having the default quantity.

P. Claims 18, 20, 24, and 27.

189. As discussed above, a trader can enter a new order by “[d]ouble click[ing] on a specific area on the Board/Quotation Screen” using an input device such as a mouse. (TSE, 9-5.) Using a single click action of a mouse to select and initiate an action was a well-known option to designers of GUIs prior to the earliest possible priority date of the ‘411 patent. Therefore, it would have been obvious to a person of ordinary skill in the art that “the single action of the user input device” [mouse input device] would “consist of a single click of the user input device.”

Q. Claims 19, 21, 25 and 28.

190. In TSE, “the single action of the user input device consists of a double-click of the user input device.” As discussed above, a trader can enter a new order by “[d]ouble click[ing] on a specific area on the Board/Quotation Screen” using an input device such as a mouse. (TSE, 9-5.)

R. Claim 26

191. I note that limitations [A] through [I] of claim 26 are identical to limitations [A] through [I] of claim 1. I have addressed these limitations above relative to claim 1. In addition, I note the preamble of claim 27 differs from claim 1 only in that claim 26 is directed to a “computer readable medium having program code recorded thereon for execution on a computer to perform the following method steps.”

192. Because TSE is a computerized trading method and system, the system of TSE utilizes software and would include a “*computer readable medium having program code recorded thereon.*”

IX. CONCLUSION

193. The findings and opinions set forth in this declaration are based on my work and examinations to date. I may continue my examinations. I may also receive additional documentation and other factual evidence over the course of this litigation that will allow me to supplement and/or refine my opinions. I reserve the right to add to, alter, or delete my opinions and my declaration upon discovery of any additional information. I reserve the right to make such changes as may be deemed necessary.

194. 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 the time allotted for cross-examination.

195. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed this 19th day of May 2014 in Sunnyvale, CA



Kendyl A. Román