

**UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

Trading Technologies)	
International, Inc.,)	
)	
Plaintiff,)	Civil Action No. 04 C 5312
)	
v.)	Judge James B. Moran
)	
eSpeed, Inc., eSpeed International, Ltd.,)	
Ecco LLC, and EccoWare Ltd.,)	
)	
Defendant.)	

EXPERT REPORT OF DAVID L. SILVERMAN

IBG 1076
IBG v. TT
CBM2016-00054

TTX02036703

1. My name is David L. Silverman. I understand that Trading Technologies International, Inc. (“TT”) has filed a lawsuit against eSpeed, Inc., eSpeed International, Ltd., Ecco LLC, and EccoWare Ltd. (collectively “eSpeed”) for infringement of various claims of U.S. Patent Nos. 6,772,132 (“the ‘132 patent”), and 6,766,304 (“the ‘304 patent”). I understand that TT has asserted claims 1, 2, 3, 7, 8, 9, 10, 14, 15, 16, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, and 54 of the ‘132 patent and claims 1, 2, 3, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36 and 37 of the ‘304 patent. I have been retained by eSpeed as a consultant and testifying expert to offer my expert opinion regarding the invalidity of the asserted claims in the ‘132 and ‘304 patents. In my opinion and as discussed in this Report, each of these claims is invalid in light of the prior art.

I. BACKGROUND AND QUALIFICATIONS

2. A copy of my curriculum vitae is attached as Exhibit 1. I obtained my bachelor’s degree in mathematics from Amherst College (Amherst, MA) in 1971. I have spent most of my professional career working in information technology, and have spent the majority of that time focused on the specification, design, development and implementation of electronic trading systems for the financial markets.

3. I have been involved with the development of electronic trading systems since the early years of electronic trading. I joined Reuters in June, 1983. From 1986-87, I coordinated the development of the Reuters Dealer Trading System (RDTS) strategy and technology platform, which was a generic architecture for electronic trading in the wholesale financial markets. Subsequently, my team developed a prototype based on the

RDTS architecture for an electronic exchange designed for trading financial futures, which we presented to the Chicago Mercantile Exchange (CME) in 1987. Reuters entered into an agreement with the CME in 1987 to provide technology for a post-market trading system, which was initially known as the PMT system. In 1988, the MATIF (Marché à Terme Internationale de France) agreed with CME and Reuters to participate in this international financial futures market. The name was changed from PMT to GLOBEX® in 1988. In 1990, the Chicago Board of Trade (CBOT) joined the GLOBEX® partnership, which ultimately launched in 1992. GLOBEX® was the first fully electronic multi-exchange global market for financial futures. GLOBEX® was initially used for after hours trading at the CME, MATIF, and the CBOT.

4. I was involved in all aspects of specifying, designing, creating, and testing all components of GLOBEX® including the order matching system, the network, the control center, and the user interfaces for the GLOBEX® system. One focal point of the work was to create an interface that would make electronic trading acceptable to all users of the trading system, including proprietary traders, market makers, and other intermediaries who were accustomed to trading by open outcry in a pit or placing orders with brokers. During the course of this work, and throughout most of my career at Reuters, I became very familiar with graphical user interfaces for trading systems, and the needs of the traders, the exchange, and other participants in an electronic trading system. I continued to work on GLOBEX through the mid-1990s.

5. In addition to my work with GLOBEX, while I was at Reuters, I designed some of the core news and real-time data components of IDN, which was at that time was the world's highest performance stock market quote distribution network. I also

designed, developed and launched Dealing 2000-2, the first successful electronic matching system for the spot foreign exchange market. Dealing 2000-2 was launched in 1992. I was responsible for the architecture, design and launch of Dealing 2000-3, an electronic soft matching system for the inter-bank FX forward market, which was launched in 1997.

6. In addition to GLOBEX (for the financial futures markets) and Dealing 2002 (for the Foreign Exchange market), I have designed trading systems for the fixed income market, and for a number of domestic money markets (including Mexico and Brazil).

7. One of the key responsibilities of my role in Reuters was to understand the needs of participants in the professional financial markets, including traders, brokers, exchanges, risk managers, and institutional end users. In order to accomplish this role I spent time observing the trading behavior of system users, interviewing them regarding trading practices, building prototypes to match their needs, and monitoring trends and patterns in end user adoption of computer technology for trading.

8. In the latter half of the 1990's I continued to work with electronic trading systems, and was particularly involved in the use of Internet technologies to extend trading access to classes of users which previously could not afford connection to proprietary trading networks.

9. I have continued to be employed by Reuters to the present day. I continue to be involved in business and technical strategy for trading systems, and as recently as 2005 was instrumental in defining a business opportunity and executing a joint venture

agreement between Reuters and the Chicago Mercantile Exchange for the next generation trading model for Foreign Exchange.

10. I am a named inventor or co-inventor on several United States Patents that relate to fundamental technologies for electronic trading. These include:

- *Distributed Matching System*, No. 5,077,665 (Dec. 31, 1991), which discloses a matching system for financial instruments, involving a host system, a keystation, and a dynamically variable book of bids and offers;
- *Anonymous Matching System*, No. 5,136,501 (Aug. 4, 1992), which discloses a matching system that effects anonymous transactions in a credit sensitive market by ensuring that matches are only executing within pre-specified counterparty credit limits;
- *Negotiated Matching System*, No. 5,924,082 (July 13, 1999), which discloses a negotiated matching system that first matches counterparties who are acceptable to each other based on trading and ranking information, and then enables the two counterparties to negotiate and finalize the terms of a transaction;
- *Distributed Matching System for Displaying a Book of Credit Filtered Bids and Offers*, No. 5,924,083 (July 13, 1999), which discloses a matching system providing real-time credit filtered market information consisting of unilaterally and/or bilaterally credit filtered orders and available quantities;
- *Electronic Trading System Featuring Arbitrage and Third-party Credit Opportunities*, No. 6,519,574 (Feb. 11, 2003), which discloses a trading system that effects credit arbitrage and/or name-switching by automatically detecting and executing transactions based on credit parameter data, name switch parameter data, and trading data.

My '665 patent was discussed during the prosecution of the TT patents in suit.

11. I am being compensated at a rate of \$750 per hour, not to exceed \$10,000 per day. No part of my compensation is conditioned upon the outcome of this litigation.

II. BASIS FOR OPINIONS AND MATERIALS REVIEWED

12. The basis for my opinions are the patents, manuals, software systems, marketing materials, and other materials identified throughout this Report, as well as my

education, training, and experience in designing and developing electronic trading systems and user interfaces for computer-based trading, and my professional interactions with traders and other participants in the wholesale financial markets.

13. In addition to the materials cited in this report, the materials I principally reviewed in connection with the preparation of this Report include:

- The specification, disclosure, portions of the file history, claims of the '132 and '304 patents, and art cited therein;
- The patents, manuals, systems, articles, marketing materials, and other materials that were part of the state of the art before March 2, 1999, which are discussed below.
- Portions of the source code for versions of GL Win software.
- Videotaped demonstration of GL Win software with Trading Pad.
- Computer provided by GL Trade containing GL Win with Trading Pad executable software.
- Portions of Expert Report of Bruce Webster.
- The depositions cited in this report, including H. Kida, L. Havard, B. Spada, P. MacGregor, N. Garrow, C. Dobson, A. Kawashima
- The Supreme Court's decision in KSR v. Teleflex.
- Translations of prior art references.

14. I may be asked to provide background information in these proceedings that will assist the Court or jury to understand the technology relevant to the patents-in-suit. At hearings and/or trial, I may rely on materials and documents publicly available or produced in this litigation by any party, as well as documents that the parties have exchanged in the course of discovery. Some of this material had been redacted. I also may rely on visual aids and demonstrative exhibits to illuminate my opinion.

15. The opinions stated in this report are based on information that I have reviewed and that is currently available to me.

16. I reserve the right to continue my investigation and study, which may include a review of documents and information that may yet be produced, as well as deposition testimony from depositions that may yet be taken in this case. Therefore, I reserve the right to expand or modify my opinions as my investigation and study continue, and to supplement my opinions in response to any additional information that becomes available to me, to any matters raised by the parties, and/or other opinions provided by the parties' expert(s).

III. DEFINITION OF THE SKILLED ARTISAN

17. Generally speaking, the '132 and '304 patents relate to a field of technology in which invention, design and development is typically conducted by skilled software engineers with at least a college and often post-graduate degree, plus 3-5 years experience in the design and coding of commercial software systems. The software engineers would be experienced in the development of systems involving real time processing and graphical user interfaces and have knowledge either themselves, or from communications or interactions with others, about the work-flow of professional traders. In the course of developing the systems discussed in paragraphs 3 through 9 above, I interviewed and recommended for hire individuals with the skills enumerated above.

IV. HISTORY OF ELECTRONIC TRADING USER INTERFACES

18. At trial, I expect to provide a general overview of the history of electronic trading and graphical user interfaces (GUIs) for trading systems, including important considerations known to persons of skill in the art in developing trading GUIs. As part of

this general overview, I expect to discuss: (1) the development and design of the various user interface displays for market data and their order entry processes; (2) the reasons for the various designs of the various user interfaces including how user types and workflow, technology constraints, market constraints, and user experience impacted design and development of user interfaces; and (3) the impact that Trading API's contributed to the design of electronic user interfaces.

19. In my opinion, by no later than March 1, 1999,¹ which is one year before the filing of the provisional patent application No. 60/186,322, the user interfaces for electronic trading had been well established and known to those of ordinary skill in the art, including the display of prices, bids and asks in a vertical format (INTEX, SPATS, SWX, TSE); a display of prices in a vertical format that did not change when the inside market changed (TSE, GL Win 4.31, Midas Kapiti); a display of prices in a vertical format in which the inside market is always centered on the screen (SWX, INTEX, IPE, MEFF); the display of the best bid and best ask in two columns with the best bid and best ask aligned side by side (DTB, GLOBEX); and this two column display that showed market depth with the bids in the left hand column under the best bid and the offers in the right hand column under the best ask (Patsystems, GLOBEX).

20. In my opinion, by no later than March 1, 1999, single action order entry had been well established in the industry on a variety of trading screens including: the vertical display of prices (SWX, LIFFE APT, GL Win 4.31, Midas Kapiti); the static vertical display of prices (GL Win 4.31, Midas Kapiti); a display of prices in a vertical format in which the inside market is always centered on the screen (SWX, LIFFE APT);

¹ My understanding is that what was known in the art more than one year prior to the effective date of TT's patent filings is relevant in these discussions. I also understand that date to be either March 2, 1999 or June 9, 1999.

the display of the best bid and best ask in two columns aligned side by side (X_Trader, Globex); and this two column display that showed market depth (Globex2, Patsystems).

A. DIFFERENT DESIGNS OF DISPLAY ORDER BOOKS (1980-1998)²

i. INTEX (1984)

21. The INTEX system was developed in the early 1980s and launched in 1984. INTEX was described in the Wall Street Journal as a “completely automated financial futures exchange.” *Bermuda Financial Futures Exchange Would Be Automated*, Wall Street Journal, April 27, 1981. INTEX appears to be the first electronic futures trading system to utilize a single vertical display of prices for screen-based representation of order book information, as shown below. DX 10; McCausland Deposition, 4/7/05, at 40-42.

TRADING SCREEN

INTEX/04-JAN-83/9:17				T-BOND			
MAR 83	PRICE	LAST: 87.30	JUN 83	PRICE	LAST: 86.19		
BID SIZE		OFFER SIZE	BID SIZE		OFFER SIZE		
	88.05	192		86.26	182		
	88.04	146		86.25	192		
	88.03	273		86.24	146		
	88.02	221		86.23	273		
	88.01	117		86.22	221		
	88.00	118		86.21	317		
	87.31	175		86.20	250		
LAST	87.30	**LAST**	**LAST**	86.19	**LAST**		
170	87.29		210	86.18			
173	87.28		324	86.17			
190	87.27		273	86.16			
142	87.26		298	86.15			
176	87.25		142	86.14			
193	87.24		176	86.13			
O: 87.25	HI: 88.03	LO: 87.23	V: 990	O: 86.15	HI: 86.25	LO: 86.15	V: 1466
ORDER TYPE	: LIMIT			LIMIT PRICE	: 87.29		
BUY/SELL	: BUY			PRINCIPAL/AGENCY:	PRINCIPAL		
QUANTITY	: 25			TIME IN FORCE	: CTC		
CONTRACT ID (MMYY):	MAR 83			MEMO	: (ACCOUNT NO.)		

22. The user interface was a character-based 80x24 line display which was designed to display one or two contracts on a single screen. The order book was displayed using a vertical price axis with bids on the left and offers on the right. The

² In this report, I have included various diagrams and illustrations for illustrative purposes. At trial in this case I may rely on other diagrams, illustrations or demonstratives that are not expressly shown in my report.

price at which the last trade took place was indicated by an on-screen indicator next to the relevant price in the price axis. As a nascent futures exchange, with only a small number of listed contracts, the users of the system did not need to concurrently view a large number of instruments on the screen. Furthermore, due to the limitations of the available telecommunications local line bandwidth in 1981, it would not have been feasible to keep a large number of instruments concurrently updated with the current market state. The design of the INTEX trading screen reflects all of those concerns regarding minimizing the required update bandwidth and providing fairly complete visibility into the exchange order book for a trader into two instruments at a time.

23. The INTEX client system included a customized keyboard with “special function keys on the keyboard which designated what type of order . . . a buy, a sell, a cancel, a replace” the user wishes to enter. Mr. McCausland testified that “you would, by a selection process, designate which contract it was that you were either bidding or offering.” Finally, the user would type in at the bottom of the screen in the trade order zone, the quantity and the price. R. McCausland Deposition, 4/7/05, at 78-79.

24. In a marketing brochure contemporaneous with the launch of INTEX, the characteristics of the INTEX system were described to prospective members of the exchange. This brochure was entitled “INTEX the Fastest, the Most Accurate, the Only Automated Futures Exchange in the World.” DX 122. It is clear that INTEX was appealing to the sensitivities of prospective users of the system for speed and accuracy.

25. The Wall Street Journal, in April 1981, made the following observations regarding INTEX:

Jay Peake (INTEX founder) terms automated trading “an idea whose time has come” and says professional market makers “can do everything on the screen”

that they now do in the pits. But they will lose “a certain time and space advantage” over outside customers because all members would have the same access to INTEX’s Bermuda computer, no matter where they are, he adds. George Lamborn, a senior managing director of Shearson Hayden Stone Inc. who has been critical of floor traders’ advantages, terms the exchange “a very interesting idea,” though he notes “it may be a few years too early.

Bermuda Financial Futures Exchange Would Be Automated, Wall Street Journal, April 27, 1981. It is clear from these contemporaneous quotes that the objective of INTEX was to provide all users with equal access to trading information and to make that information as complete as a floor trader would see in a trading pit. Since INTEX was a startup exchange, there were no vested interests of floor traders to contend with, and the best solution was to provide high transparency for all participants.

ii. SPATS (1987)

26. The software which had been developed by INTEX was subsequently licensed to Security Pacific Bank and formed the basis for the Security Pacific Automated Trading System also known as SPATS. See “Automated Trading: CBOT Approves EJV Deal, But Board Gives Thumbs Down To Non-Member Use of System,” Investment Management Technology (Waters Information Services, Inc., October 2, 1992). An illustration of the SPATS order book display is shown below. This display is based on a vertical price axis with bids on the left and offers on the right. DX 446, § 3.3.

3.3 BOOK DISPLAY MARKETS

All active issues where the market maker is willing to display continuous two sided markets will be displayed in this group. There will be separate pages for bills, coupons and agencies with six issues shown on each page. A sample page is shown below:

Issue	Best Bid	Best Offer	Yield
12.500 05/07	105.01	104.29	6.518
12.750 06/07	104.21	103.15	6.809
12.775 08/07	104.89	104.86	6.379
12.775 01/01	105.01	104.29	6.518
12.000 02/09	104.12	103.11	6.765
9.875 05/09	105.01	104.29	6.518

The information on a typical book display page is:

1. Designation of the most recent auctioned issue in that maturity.
2. Full issue description.
3. Best three bids in the issue with size. In this case there are 500 notes bid at 104.29. There are also 500 notes bid at 104.28.

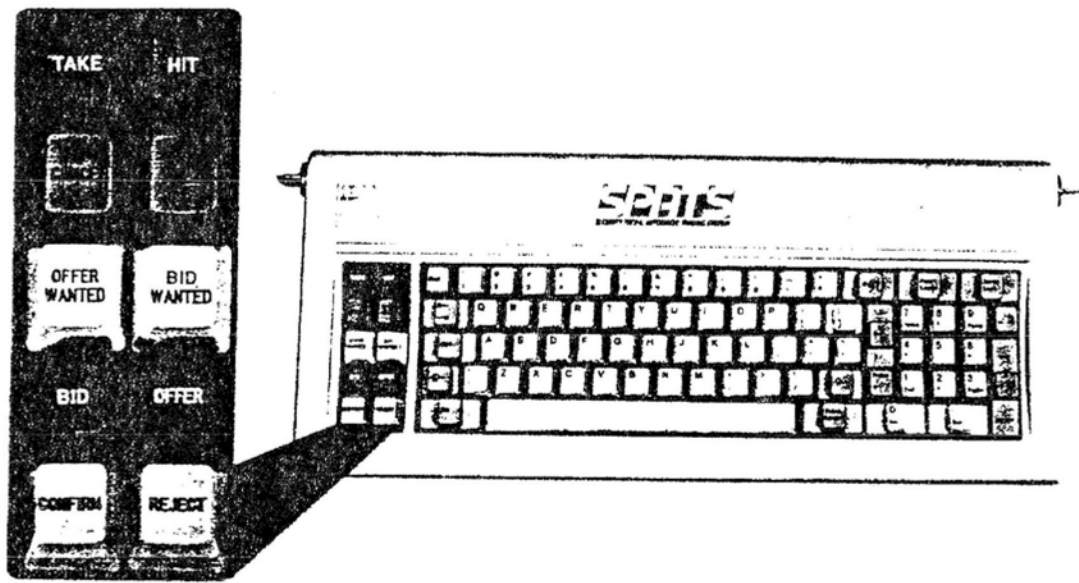
4. Best three offers in the issue with size. In this case, there are 500 notes offered at 105.01.
5. Last sale in the issue. If no trade has taken place, this field will be blank.
6. Yield to maturity for the issue. The yield is figured to the offered side of the market. If there are no offers, it is figured to the bid side; and if there are no bids or offers, it is figured to the last sale.

27. Whereas INTEX was designed for the trading of financial futures, the SPATS system was designed to trade so-called "odd lots" of US government bonds. However, due to lack of liquidity, the SPATS system failed within two years of its launch. See Susan Kelly, "Chapelaine Unveils Trading System for Government Securities," American Banker, March 22, 1989.

28. The established mechanism for trading of US Government securities was through the facilities provided by the Inter-Dealer Brokers ("IDB") of the day. Typically, these IDBs provided a screen which displayed the best bid and best offer price, only without any visibility into resting orders behind the best bid and best offer. In fact, in some markets the brokerage convention was that a dealer's bid or offer would automatically be cancelled by the broker if a better bid or offer was received. This

convention, known as an “auction market” was the established practice in the inter-dealer market for US Government bonds. Furthermore, the US Government securities market was then, and still is, a two-tier market. In the center of the market sit the Primary Dealers who are the only entities able to bid directly for the debt obligations of the US Government. These Primary Dealers then trade anonymously between themselves through the facilities of the IDBs and make secondary markets in these instruments for all other buy-side participants such as hedge funds, asset managers, and mutual funds (also known as the “retail market”). Security Pacific elected not to compete head-to-head with the IDBs and instead it elected to provide a trading screen which was functionally different from and whose participation would be broader than that provided by the IDBs. It targeted its product at the “odd lots” market for government bonds. Consequently, it made sense to adopt the order book paradigm (different from the auction market paradigm of the inter-dealer market) and the full vertical order book display pioneered by INTEX for the futures market, and adapt this for the government securities odd-lot market.

29. The SPATS system was designed to allow very rapid entry of “Hit” and “Take” orders (market sell and market buy). By using a custom keyboard with the trading keys prominently located, the trader could enter an order with as few as four keystrokes (Hit/5/Enter/Confirm). The trading keys of the SPATS keyboard are shown below. DX 446, § 1.3.



iii. *The CME Universal Broker System (CUBS) (1992)*

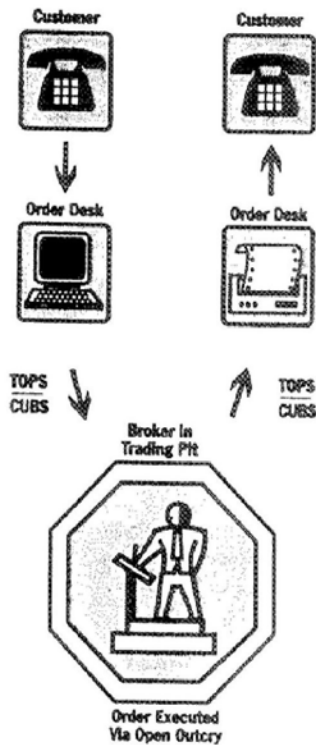
30. In order to improve the efficiency and reduce the incidence of errors in the handling of floor orders, the CME developed the CUBS (“CME Universal Broker System”) system in the late 1980s, which was being field tested by 1992. See David Nusbaum, “Where No Trading System Has Gone Before,” *Futures*, July 1, 1992. This use of technology was designed to imitate the manual processes of the floor brokers but to do it in a manner which greatly reduced the use of paper, and thereby reduced the incidence of errors. CUBS was not a complete electronic exchange inasmuch as order execution still took place within the pit on the floor of the exchange. However, CUBS did automate the printing and management of order forms. An added benefit of the CUBS system was that order information was captured electronically and this allowed the exchange to create a more efficient and comprehensive capture and dissemination of market information.

31. A diagram illustrating the CME Universal Broker System (CUBS), which also shows how bids and offers were arranged along a vertical price axis, is shown below:

WHAT IS THE CUBS ORDER FLOW?

The CUBS order flow is initiated by a customer's telephone call to a CME Clearing Member Firm's order desk. The Account Executive or clerk enters the customer order into TOPS. TOPS gives the order to CUBS where the specific broker is determined for routing. The order is delivered to that broker's CUBS station. The order is executed, in the pit, by the broker, via OPEN OUTCRY. The broker then enters the endorsement information into CUBS. A fill report is generated and transmitted back to TOPS. TOPS then routes the fill report back to the member firm's order desk which initiated the order. The Account Executive telephones the customer to report the fill.

CUBS Order Flow



HOW DOES CUBS HANDLE ORDERS?

The CUBS station is comprised of a number of windows as depicted in the following diagram. These windows functionally divide the broker's activities into Order Acceptance, Deck Management, and Endorsement.

Broker CUBS Screen

LF000	NEXT=2	SEFO	NEXT	PREV	GOTO	NOTE	CLR
6433	8	31	↑	TRF1	BUY 5	SFZ1	6429
6432	5	23					
6431	11	18					
6430	7	7					
LP	3	6429	DN				
5	2	6428					
9	4	6427					
18	9	6426					
45	27	6425					

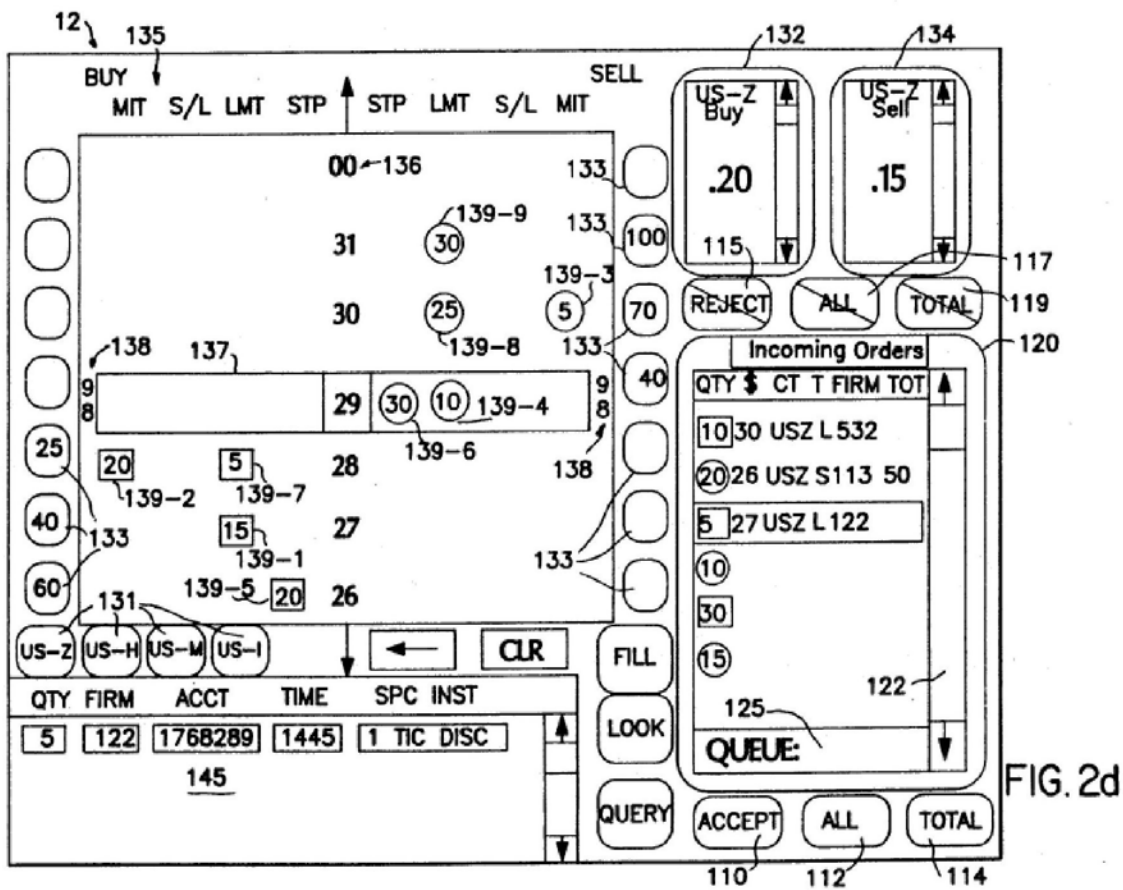
ACCEPT ALL	PARMITS	QTY	PRICE	MARK
TRADING ORDER=2		7	8	9
TRF1 BUY 5 SFZ1 6429 LMTT	REJ	4	5	5
SELL 7 SFZ1 6432 LMTT	REJ	1	2	3
	REJ	CLR	0	SET
		100	200	300

1. Incoming Window

Orders that are received at a broker's station are listed in the Incoming Window waiting for acceptance. From this window a broker may either accept or reject an order. If the order is rejected, it is sent back to TOPS. If the order is accepted, it is moved from the Incoming Window to the Broker's Deck Window.

Cubs Brochure.

32. A similar system is reflected in United States Patent No. 5,297,031 (“the Gutterman patent”), which issued in 1994. This patent discloses a method for managing trade orders in a futures market. The system described in the patent would be used by a broker on an exchange, whose workflow consists of receiving customer orders, accepting or rejecting those orders, and then executing those orders on the exchange. The system is not an electronic exchange in that it does not include a means of order execution, per se, but rather an application for managing orders. It is similar to the TT patents in this regard. The illustration below is from the ‘031 patent and depicts many of the significant elements of this system:



'031 Patent, Fig. 2d. The different components of this illustration are identified by numbers connected to the elements of the display (e.g. the 12 in the upper left corner, or the 120 on the right edge). In particular, as explained within the specification and disclosure of the '031 patent, the column of numbers ranging from 26 up to 00 is a vertical price axis (identified as 136 in the drawing). The numbers on the left (60, 40, 25) are cumulative bid quantities (identified as 133 in the drawing). The numbers on the right (40, 70, 100) are cumulative ask quantities (also identified as 133 in the drawing). The last trade is at 29. The brokers own orders are shown in association with this display as the squares (20, 5, 15, 20) for bids and the circles (30, 10, 25, 5, 30) for asks (identified as 139-x in the drawing). See '031 Patent, at 12:25-56. The bar across the center, identified as 137, indicates the price of the last trade in the market. '031 Patent at 12:7-24.

iv. GLOBEX (1992)

33. In 1987, Reuters demonstrated a prototype government securities trading system to the CME. This system in its prototype utilized a market grid display which allowed the trader to display up to 24 instruments on the screen at the same time. For each instrument, the most critical fields including the instrument name, the last sale price, best bid, best offer, bid and offer size, and yield to maturity of the last sale were concurrently updated. This system included state-of-the-art technology for user interaction, such as a custom designed keyboard for rapid, error-free order entry and order management and voice-activated input. This prototype, although configured for trading cash bonds, was based upon the RDTS architecture which was a generic platform for trading any asset type. As such, it could be easily configured in terms of its display

characteristics, input characteristics, and order processing logic to address the electronic trading needs of a futures exchange.

34. In the summer of 1987, Reuters and the CME entered into the Pre and Post Market Trading ("PMT") Agreement which provided a framework whereby Reuters would supply technology and operations to the CME for trading the CME futures on Reuters electronic trading platform. The PMT Agreement subsequently became the GLOBEX Agreement and the technology provided by Reuters became known as the GLOBEX system.

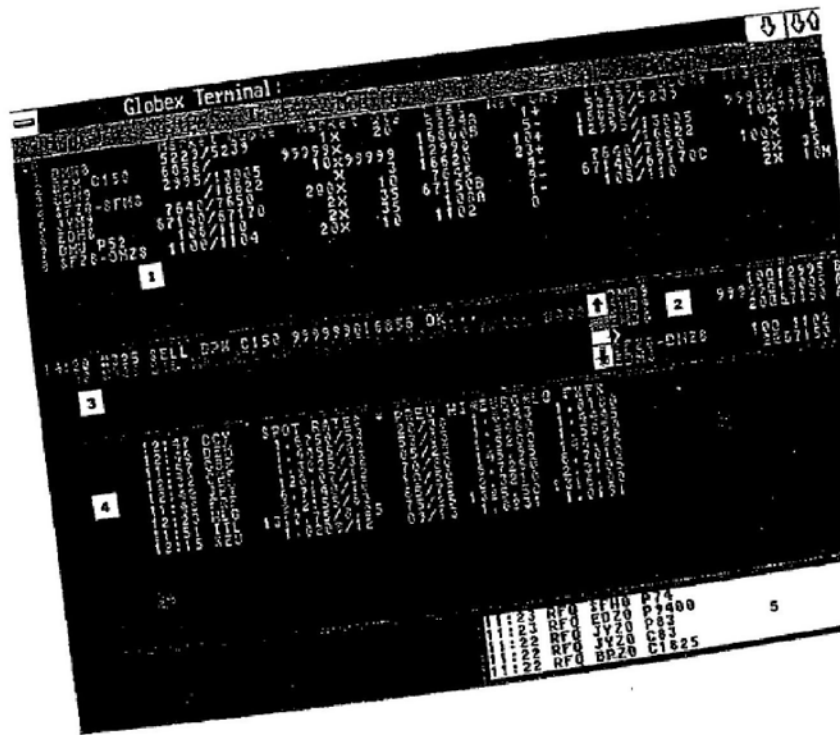
35. From the outset, GLOBEX was envisioned to be a multi exchange trading system. The CME invited participation from all of the major global financial futures exchanges including the CBOT, MATIF, LIFFE, SOFFEX, DTB, NYMEX, IPE and others. Ultimately, the CBOT and MATIF joined as partners in the venture whereas some of the other exchanges elected to adopt their own electronic trading technologies. Having multiple exchanges as constituents resulted in a complex and protracted process for agreeing on system requirements. The most significant and influential participants in the requirements definition process were the large FCM members and the market operations and surveillance staff of the exchanges themselves. From an early stage, the exchanges agreed that a single display format would be used by all users and by all exchanges. This created the ability to display markets across multiple exchanges on a single screen. It also meant that the characteristics of that display had to be a common denominator across all of those exchange products.

36. The market grid was deemed to be a very useful component inasmuch as it allowed the display of multiple instruments concurrently. However, it was also viewed

as desirable to be able to display the order book consisting of those bids and offers below and above the best bid and the best offer for selected instruments. There were significant bandwidth considerations in the design of this system, and the available bandwidth was limited to 9600 bps. Additionally, there were severe constraints relating to provision of a level playing field that would ensure all market participants would receive the same information within a narrow time window. In this design, it was viewed that a market grid was the primary means for monitoring the state of the market which would allow the brokers (who were also largely responsible for defining the display) to monitor multiple instruments and be able to rapidly provide best bid and offer information to their customers on the phone.

37. However, there was a need particularly for larger customers and for larger orders to provide visibility into the order book for selected instruments at selected points in time. The compromise was to provide a function whereby the GLOBEX user could click on a single instrument and request a pop-up window display of a pre-defined region of the central limit order book. Due to bandwidth constraints, the number of such windows that could be concurrently on the screen was limited and the depth of display of those windows was limited to the best five bids and the best five offers. In order not to obscure more of the display than absolutely necessary, these pop-up book display windows were designed to be as compact as possible. In particular only those price levels with an active bid or offer were shown and the bids were shown beside the offers with the best bid and best offer at the top of their respective lists. In this way, the pop-up book display mimicked the best bid / best offer display in the market grid while providing information on the depth of the market beneath that best bid and offer. The illustration

below is a GLOBEX screen from a 1989 brochure, which shows a grid of multiple futures contracts. The second illustration is a pop-up window with a compressed order book display for a single instrument, from a GLOBEX manual later published in 1997.



Exchange and Instrument name Last Trade Price or Settle-Last Time of Last Trade

Exchange and Instrument name		Last Trade Price or Settle-Last		Time of Last Trade	
MBPH7 15068S 15:22					
Bid Px	Qty	Offer Px	Qty		
15066	10	15068	20		
15064	20				
15062	10				
15060	10				
15058	10				

Figure 10-1: Book Window

See DX 1, at 11 (eS0003971); Globex User Guide, at 114 (eS0069942).

38. A complete order in the GLOBEX system consists of many data fields. Some of these fields are trade-related such as the bid/offer indicator, the order price, the order size, and the order type. Some of these fields are clearing-related such as the new/liquidating indicator, the clearing account, the customer account, and several other fields which are clearing or settlement related. Entry of all of this data at the time of order entry would be far too slow in most cases. Therefore a complete system of order defaults was defined for GLOBEX. By defining default values for trade size, trade price, and clearing data it was possible to enter a GLOBEX order with as few as two keystrokes (BID / Enter). *See Globex User Guide, Section 13, Customizing Order Entry, 1997, at eS0069971.*

39. The combination of predetermined default values for certain order fields, together with the dynamic value on the screen for other fields (such as price), allowed the GLOBEX user to enter an order with a single action consisting of two keystrokes. When the BID or OFFER or HIT or TAKE key was depressed the relevant dynamic data (the order price) was filled into the trade order. Other order default data (such as clearing parameters and order size default) was retrieved from pre-established defaults. The particular key which was depressed determined the order type (buy or sell) and order qualifier (good-till-cancelled or fill-and-kill). The "OK" button was pre-selected and defaulted in the order window, so that by depressing a trade key and immediately depressing the TRANSMIT key, an order could be filled with all necessary data and sent to the exchange for execution. *See System Functional Specification, GLOBEX Keystation, August 1, 1991, page 150.* There was discussion with the exchange and its members on the benefits and risks of omitting the single-keystroke confirmation, and on

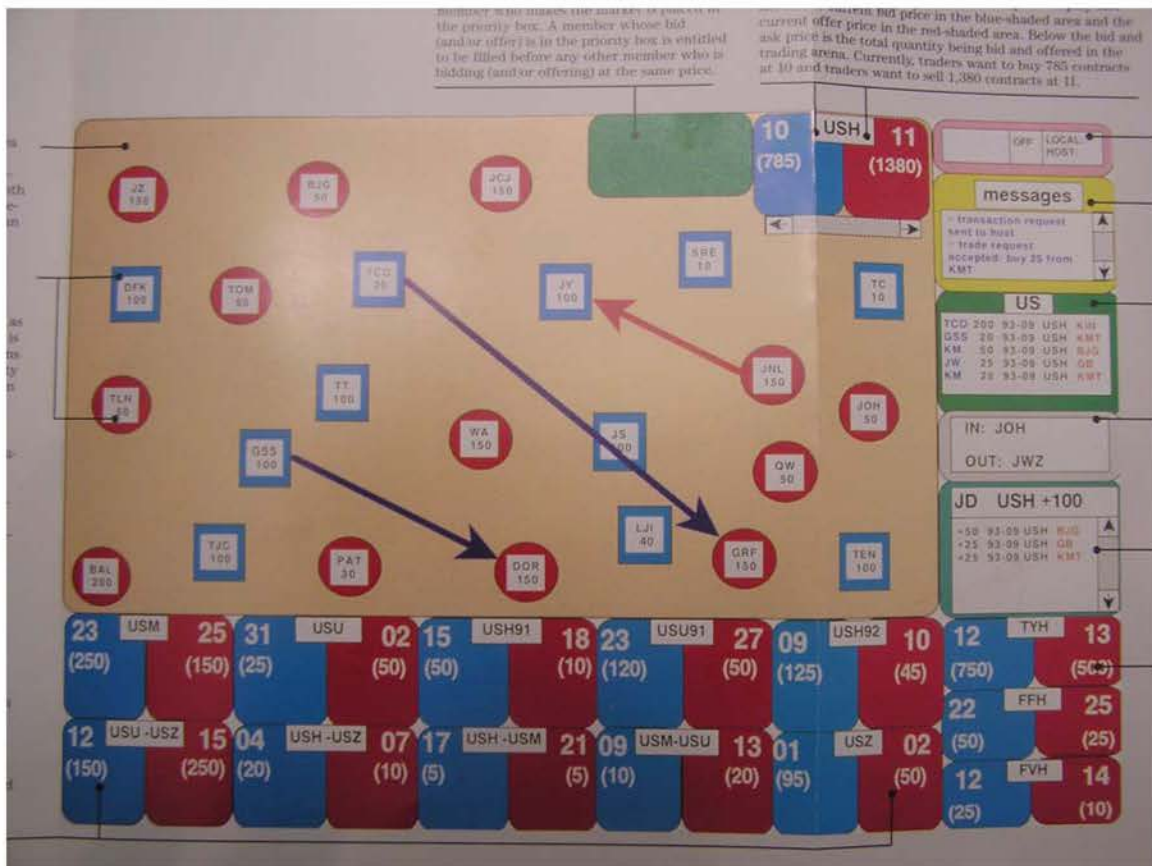
balance, it was felt that the new users of the GLOBEX system would find comfort in knowing that they would see their order prior to it being submitted for execution.

40. Since a broker on GLOBEX might be managing orders for multiple customers and therefore have a large number of active orders in the market, there was a requirement that the user could retrieve a list of all of his or her active orders quickly and cancel anyone or all of them through a single key click. Therefore, a custom-designed key was included on the GLOBEX keyboard (the CANCEL key) to retrieve all active orders. When these orders were on display, the user could cancel all orders with a single keystroke (the TRANSMIT key). Alternatively, the user could select any number of individual orders from the display, and when ready to cancel could cancel the selected orders with a single keystroke (the TRANSMIT key). *See* System Functional Specification, GLOBEX Keystation, August 1, 1991, page 195. This facilitated the work flow of order handling brokers.

v. **CBOT Project A (AURORA) (1989)**

41. In 1989, the Chicago Board of Trade unveiled AURORA, also known as Project A. *See* David Dishneau, "CBOT Unveils Electronic Trading System (Associated Press, March 16, 1989). AURORA is an electronic auction market system that gives global market participants immediate access to the world's most actively traded futures contracts when the physical auction market is closed. In order to make it the system appealing and familiar to traders who were used to the pit trading environment, the

AURORA trading screen attempted to replicate the pit environment:



DX 67, CBOT's Aurora Brochure, 1990. On this screen, the red circles represent members who are offering to sell and the blue squares represent members who are bidding to buy. Icons list the member's acronym and the quantity available. At the bottom of the screen are the price displays of other contract months not listed in the trading arenas. There is room on the screen to list up to 10 contract month price displays, allowing participants to view current bids and offers and quantities for each.

42. The Pit Trade Summary Box, the box on the right hand side under the messages box, portrays the most recent trades that have been made in the pit. The last box shown on the right hand side of the screen is the Personal Trade Summary Box. This box summarizes all trades that the member has made. DX 67.

43. In order to place a trade, the trader simply points at another member's icon on the screen and clicks. With one click of the mouse, the trade is made. With this one click trading feature, the AURORA system was seeking to approximate the speed of placing an order in actual pit environment as discussed above. When the trade takes place, an arrow will appear connecting the two member icons. DX 67.

vi. LIFFE APT (1989)

44. In 1988, the CME invited LIFFE to join the GLOBEX consortium and I was involved in several discussions with LIFFE management and the LIFFE technology department regarding the functionality and characteristics of GLOBEX. LIFFE was in the process of developing their own electronic trading solution and had decided to build a platform which mimicked the operation of a pit trading environment. The LIFFE APT screen is shown below:

LIFE		LIVE APT		WOB		Tue Feb 4 13:17:36		SETUP		ORDERS		No Requests for quotes											
												No Active Orders											
												Time	Brd_ref	Ac	ALL	T	CTR	MIN	Price	Vol	Comm	MTB	ACC
DB												12:50:48	H	B	NDE	NJS	85.15	20	BUND	MAR91			
YSL												12:50:58	U	B	NDE	NJS	85.15	20	BUND	MAR91			
4th																							
3rd																							
2nd																							
Last																							

OSD		BUND		MAR91		OPEN		PERM C		LIVE		OSD		BUND		JUN91		OPEN		PERM C		LIVE		OSD		
Unalloc												Unalloc											Unalloc			
OUT												OUT											OUT			
85.19												-0.02											85.1			
OFFER												OFFER											OFFER			
20												0											50			
Volume												Volume											Volume			
20												0											50			
SELL												SELL											SELL			
BID												BID											BID			
OFFER												OFFER											OFFER			
20												20 (20) @ 85.16											25 (25) @ 85.18			
BUY												BUY											BUY			
Volume												Volume											Volume			
20												0											25			
BID												BID											BID			
85.18												-0.02											85.1			
OUT												OUT											OUT			
Unalloc												Unalloc											Unalloc			
Gross: 40 Net: 40 High: 85.18 Low: 85.04 Vol: 40												Gross: 0 Net: 0 High: 85.18 Low: 85.12 Vol: 550														

Quote repeated too soon												Request for Quote issued											
EXIT	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	OUT	PULL	STOP								
BUND	BUND	LGILL	LGILL	SSTERL	SSTERL	JOB	JOB	FTSE	JOB	EGROE	EGU												
MAR91	JUN91	MAR91	JUN91	MAR91	JUN91	MAR91	JUN91	MAR91	JUN91	MAR91	JUN91												

DX 149.

45. Similar to Aurora, the LIFFE APT screen also sought to replicate the pit trading environment. The screen displays icons the traders who are active in the particular contract. Bids and offers can be made by traders in the pit, so long as the bid/offer is at the best price. Offered volumes are shown against the trader's mnemonic in red – bid volumes in blue. In the center of the screen is shown the best bid/offered prices, together with the total volume currently being bid/offered. The offered price is shown in red – the bid price and volume in blue. DX 148, at 4.

46. By clicking the mouse against the BUY command on the screen, the trader is able to buy at the best offered price, up to the specified volume. Similarly, the SELL command is used to sell at the best bid price. By clicking the mouse against the BID

command on the screen, the trader is able to bid a previously specified number of contracts at a given price. The OFFER command works similarly. In addition, the BID & OFFER command provides the facility to bid and offer simultaneously. DX 148, at 4.

47. At any time, a trader can immediately cancel individual bids or offers by using the “OUT” command. Also, all bid and offers can immediately be cancelled and active orders suspended, by using the “STOP” command. The screen also displays: (i) the last trade executed; (ii) high/low volume information; and (iii) the trader’s net and gross position for the day. DX 148, at 4.

48. On the LIFFE APT screen, in three places, there was an “OSD” button which stands for “Order Summary Display.” Clicking on this button brought up the Order Summary Display window which showed a vertical display of the prices, bids, offers, and market depth. The inside market would be shown in the center of the screen. A diagram of the OSD window is shown below. Paul MacGregor Dep., 11/1/05, at 25-26.

LGILT DEC89						
Aggr. @ Avg.				Vol @ Price		
45	a	97-03		30	a	97-05
15	a	96-31		9	a	97-00
6	a	96-30		5	a	96-30
1	a	96-28		1	a	96-28
Cancel		1	(1) a	96-26	Cancel	
Sell		96-28	8 3	(3)	Buy	
96-26	f	3		96-26	f	3
96-24	f	23		96-24	f	20
96-24	f	33		96-22	f	10

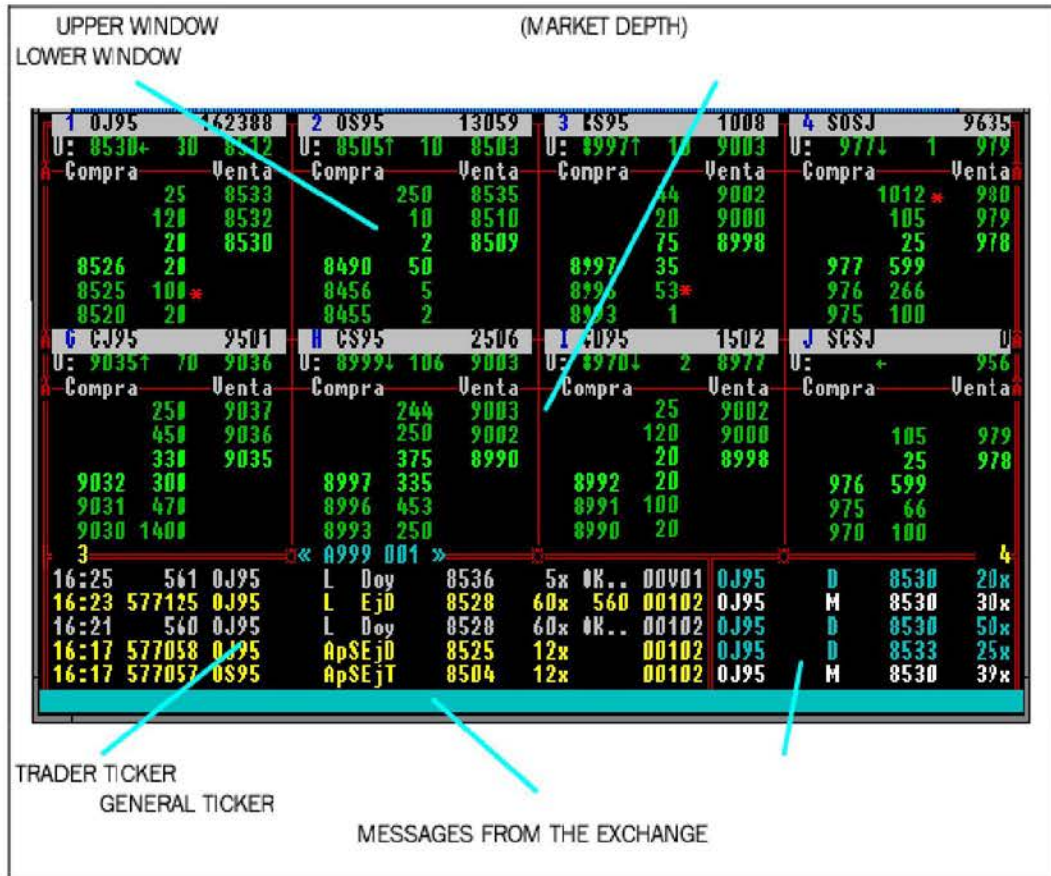
DX 150.

49. To place orders in the OSD screen, the traders could bring up an order ticket and fill it in. Or, the trader could click on the best bid or best offer button with a single click to send the order. MacGregor Dep., 11/1/05, at 47-48.

vii. MEFF (1997)

50. The “Mercado Espanol de Futuros Financieros” (or “MEFF”) a derivatives exchange, launched a fully electronic financial futures exchange in Barcelona in 1990. In

October 1997 MEFF published an overview document which included this illustration of the trading screen. See Meff Renta System Description, Oct. 1997, at 22.



This trading screen utilizes a vertical format to display the best three bids and best three offers in the order book. Unlike the vertical price axis of INTEX, the price axis of MEFF is split so that the bid prices are on the left and the offer prices are on the right, and the quantities are in the middle.

viii. Swiss Stock Exchange (1998)

51. In 1998, the Swiss Stock Exchange had an electronic system called the SWX Trading System. A window in that system was a vertical display of the order book

which is shown below. See Swiss Exchange SWX TS User Manual, at 6-14 (eS0032359).

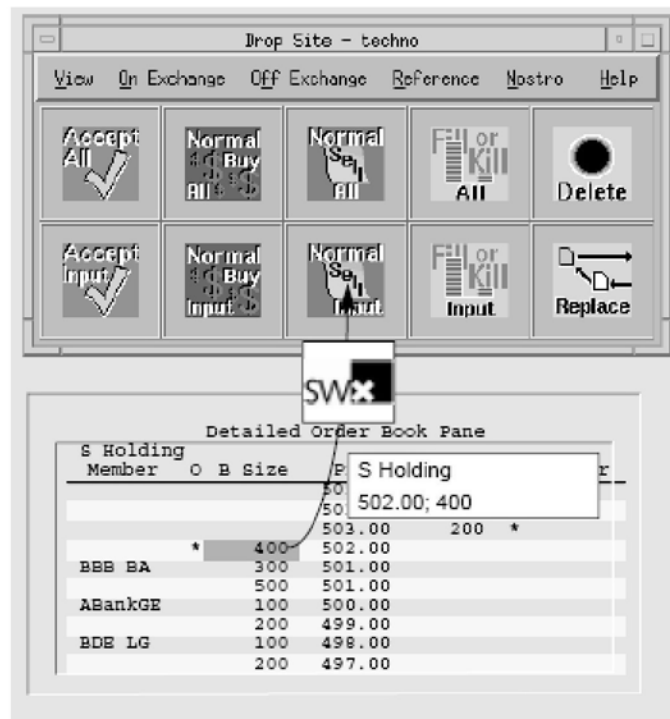


Fig. 56: Drop Site Pane and Detailed Order Book Pane. Dragging the selected data on the Normal Sell Input opens an Order Entry Window for a sell order, irrespective of whether the data was selected on the buy or the sell side. Security and prices are automatically set to the selected data; only the order size need be entered manually.

In this display, all orders for the same prices are accumulated. SWX TS User Manual at 4-4 (eS0032328) To the left of the price column is the bid size and to the right the ask size. Orders marked with a star in the “O” column indicate the trader’s own working orders. SWX TS User Manual at 6-7 (eS0032352).

52. One way to enter an order is for the user to select a price in the window. By holding down the middle mouse button, he drags the SWX Icon onto the “Normal Buy All” drop site. The selected data is displayed in a separate window as long as the middle mouse button is held down. The order will then be transmitted to the exchange

without further confirmation from the trader. SWX TS User Manual. at 6-16 (eS0032361).

53. A second way to enter an order is to drag the icon onto the “Accept Input” drop site. When this happens a detailed order entry window is presented to the user, with the price filled in, but the quantity set to zero. The user needs to fill in the quantity and make any other necessary adjustments to the order prior to transmitting to the exchange. The detailed order entry window is shown below. SWX TS User Manual at 6-33 (eS0032378):

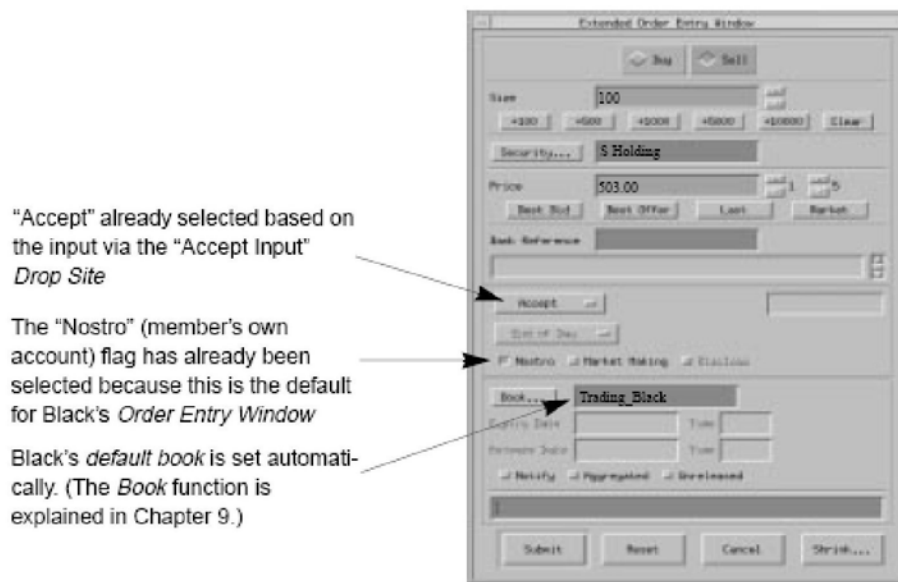


Fig. 72: Order Entry Window for the entry of a Nostro Accept Order. The trader has configured the setting of the “Nostro” flag as the default for order.

ix. The Tokyo Stock Exchange (1998)

54. The Tokyo Stock Exchange (“TSE”) was a pioneer in the use of computer technology. The initial uses of technology by the TSE were directed at automating some of the functions on the floor of the exchange. In the early 1980’s the TSE adopted software based on the CATS (“Computer Assisted Trading System”) system, which had

been developed in 1977 for the Toronto Stock Exchange, as the first use of computerized matching technology for the TSE. The following picture and accompanying text describe some of the features of this early use of screen-based trading technology by the TSE.

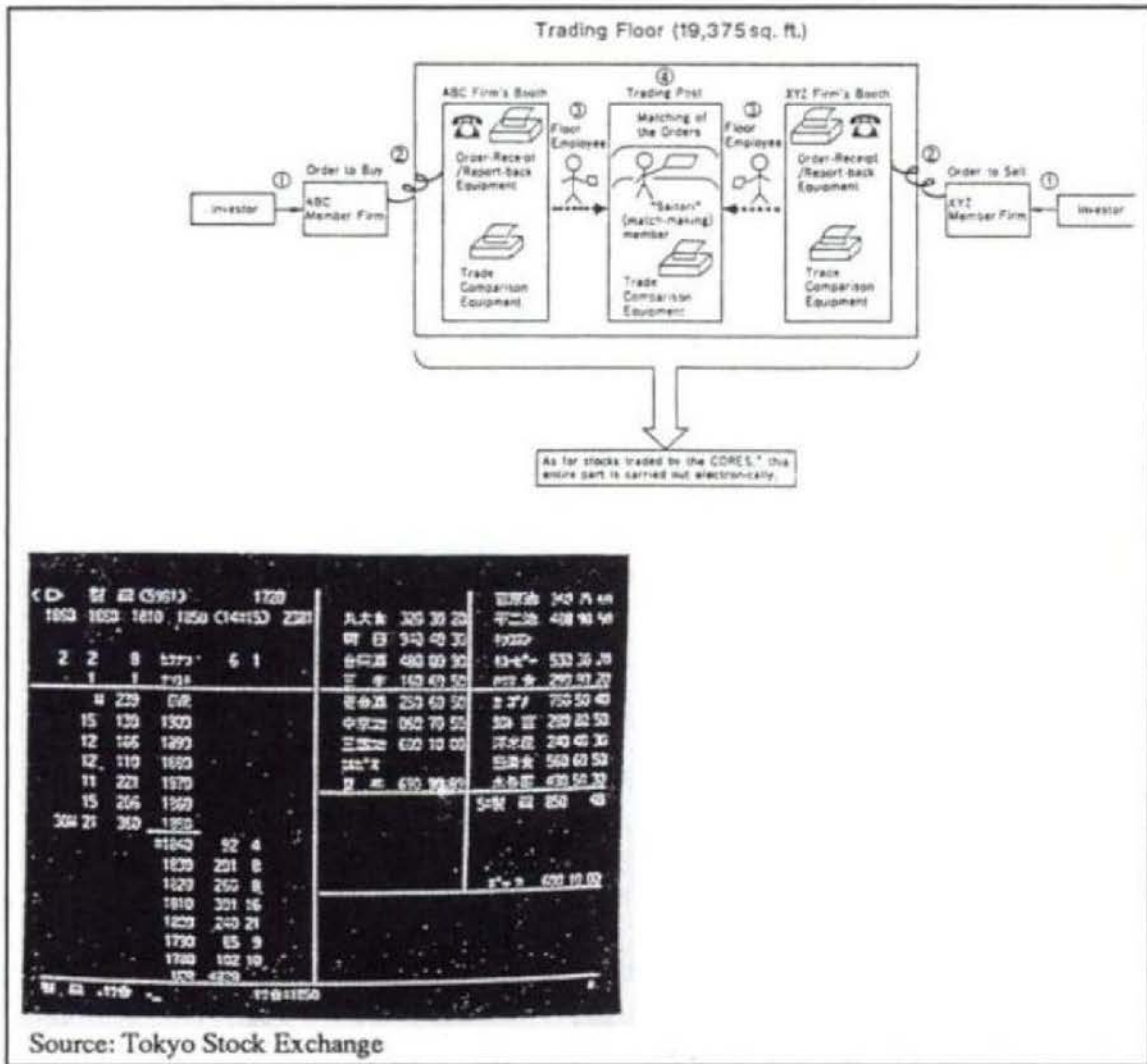


Figure 9: Trading on the Tokyo Stock Exchange -- Floor Trading Process and CORES Screen Display

Bruce W. Weber, "Information Technology in the Major Financial Markets," *in* Global Information Systems and Technology: Focus on the Organization and Its Functional

Areas, at 158-59 (P. Candace Deans & Kirk R. Karwan, eds., 1994). The Weber article contains the following discussion and explanation of the diagram above:

The TSE's trading mechanism is an agency auction overseen by a "*Saitori*", a special class of TSE member, that matches submitted orders, and smooths price swings by calling trading halts when an imbalance of buy and sell orders exists. TSE stocks have "price collars" that specify the maximum allowable price movement in a day. When these limits are reached trading stops and can continue only at prices within the limits. In contrast, NYSE specialists are expected to facilitate a continuous, "fair and orderly" market by trading as a principal for their own account. The TSE introduced the Computer Assisted Order Routing and Execution System (CORES) in 1982. CORES is modeled after Toronto's CATS. Floor trading has remained for the 150 most active issues, and CORES accounted for 44 percent of the TSE's volume in 1989.

The CORES screen is broken into three sections. On the right hand side is a display of prices for a number of stocks and the index. On the left hand side is detailed information on a single stock. The top left section displays the name of the stock, its maximum allowable trading range for the day, and market orders and market-on-close orders. The lower left section is limit order book, which in this case displays a bid of ¥1,840 for 9,200 shares and an offer price of ¥1,850 for 36,000 shares with another 20,600 shares available at ¥1,860.

The Japanese financial industry has moved in derivatives traded belatedly. The Tokyo International Financial Futures Exchange (TIFFE) opened in June 1989. In February 1991, the Fully Automated Computer Trading System (FACTS) was completed. About 5,000 contracts were traded daily in 1992, placing TIFFE among the ten largest derivative markets in the world.

55. It is significant to note that as early as the late 1980s, the Tokyo Stock Exchange was using a vertical price axis to display market depth. This has been a feature of Japanese trading screens since the inception of electronic trading in that region. For example, the Tokyo International Financial Futures Exchange ("TIFFE") and the Osaka Stock Exchange ("OSE") also used a vertical price ladder to display market depth. The TIFFE (first) and OSE screen (second) are shown below:

56. The TSE updated its trading technology with major new releases of trading systems during the 1990s, including using the Windows NT operating system. These new systems were designed to meet the needs of the trading participants (initially broker exchange members only, using exchange proprietary trading screens, followed by non-members using ISV screens in the late 1990s).

57. The TSE in the mid-1990s had two futures contracts with significant open interest and international participation. These two contracts were the Japanese Government Bonds ("JGB") futures and the TOPIX index future (a stock index future). In 1997 and 1998, the TSE published information describing a next generation futures options trading system which would trade those derivative contracts. One of these publications was entitled "Futures/Options Trading System Guidelines for Operating the Trading Terminals", published by the Tokyo Stock Exchange Business Systems Development department, and dated August 1998. I will refer to this publication and the system which it describes as "TSE98."

58. TSE98 described a trading interface which incorporated many of the features which were to be found in other electronic trading systems in use around the world at that time, and which had been in use in Japan for over ten years. In particular, the TSE98 system described an approach to displaying market depth using a vertical price axis which could either be "static" (as interpreted by the Court), or could be automatically re-centered based on movement of the inside market. The choice between these two modes of display was fully in the hands of the end user of the screen. The market depth display component of the TSE98 screen is shown below (TSE000753):

①	②		③			
Continuing	01	Long-term Gov. Bond	Basic	13296		
	④ K13320(13:17) (2012)		⑤ ▲	H	▼	⑥
⑧	10	250	At Close	250	⑧ 15	⑩
⑨	Caution		At Market	10	1	⑩
	157	1810	OVER			⑩ 13291
	2	1	3	13029		(9:05)
	2	4	132	13028		H 13320
		4	145	13027		(9:46)
		2	70	13026		L 13274
	5	2	29	13025		(9:10)
		1	20	13024		P 13310
		1	5	13023# ⑮	5	(13:16)
				13022		(2021)
				13021		C +13
	10			13020K ⑯		V 42588
				13019	17	L5 13005 ⑰
				13018	47	(13:14)
				13017	5	L4 13008
				13016	36	(13:15)
				13015	44	2 L3 13009
				13014	46	(13:15)
				13013	123	L2 13008
				13012	141	(13:16)
				13011	2	L1 13009
				13010	817	(13:16)
				UNDER	6084	W 5 ⑱
					169	

59. As discussed earlier, vertical market displays, in 1998, were a well known method to graphically depict the state of a dynamic market. When designing a vertical market display, the designer must make a decision regarding the range of prices that will be placed on the display at any given moment in time. This decision is based among other things on the amount of screen real estate available for this function and in balance with the other functions to which the screen would be applied. The nature of the market itself, *i.e.*, whether it typically has many “resting orders” at prices outside the inside market, or not, also impacts the design decision. Additionally, as the prices in the market change, a decision needs to be made regarding if and when the prices on display will be adjusted to reflect the center point of the dynamic market.

60. TSE98 addressed the first question of screen real estate by specifying two configurations which could be selected by the terminal user. In one configuration, the screen could be used to display the market for two separate instruments and in the second configuration, the screen can be used to display four or six individual markets. When the screen was used for two markets, the screen displayed 20 price levels. And when it was used for four or six markets, each market displayed seven price levels. (TSE000757, Page 7-21).

61. TSE98 addressed the second question (relating to determining which price levels should be on display) by implementing a solution which allowed the screen user to select either (a) a static price axis, which always kept the same prices on display unless and until the user pressed the "HOME" key or "SCROLL" key to re-center or shift the display), or (b) a price axis which kept the same prices on display as long as the inside market moved within a predefined range of the prices on display and re-centered the price range automatically if the inside market moved outside that range. *See* TSE761-62.

62. For example, in the two market display with 20 price levels available for each market, the prices three ticks above the center price and three ticks below the center price are known as the floating display area. Provided that the last traded price stays within the floating display area, then the range of prices on display does not change. The same functionality applies in the four or six market display however the "floating display area" is a range of one price above and one price below in the display of seven price levels. *See* TSE 761. This description of the dynamics of the vertical price axis in TSE98 was further confirmed by Mr. Hiroyuki Kida in his deposition. Hiroyuki Kida Deposition, 5/15/07, at 112-125.

63. In the TSE system described in the 1998 manual, if the last traded price is outside the floating display area described above, then the range of prices on display is automatically re-centered with the last traded price as the center price and the appropriate number of price levels (depending on a two market or four/six market display) displayed above and below the center price. This display was called the basic board screen. TSE 761.

64. In addition to the basic board screen, TSE98 also provided a mode in which the price axis was static and would not be automatically re-centered by the system. This mode of market display was activated utilizing a scroll key and is known as the scroll mode. TSE 762; Kida Dep. at 133-34. In the scroll mode, the user can scroll the price display up or down by one tick at a time or by ten ticks at a time in the two positioned display and three at a time for the four or six positioned display. TSE 762; Kida. Dep. at 134-35.

65. When in the scroll mode, the bids and offers continue to update dynamically on the screen and trades are indicated in the same manner as in the non scrolling mode. TSE 762. However, if the last trade price moves outside of the so-called floating display area, the range of prices on the screen do not change as it would in the basic board screen. TSE 762. This description of the functionality of the TSE98 screen in the static mode was further confirmed by Mr. Kida during his deposition. Kida Dep., at 122-25, 134-35, 331-34.

66. Mr. Kida also confirmed that the OSE user interface behaved in a similar way. Kida Dep. at 325, 329.

67. In addition, the TIFFE manual at REFCO 0010947 indicates that the price axis of TIFFE behaved similarly to the TSE.

68. The order entry functionality as described in the 1998 TSE manual incorporates many of the features that were well known in the art of developing trading interfaces. For example, much of the data required for order entry could be set as a default and much of the dynamic data of an order could be retrieved by reference to the location on the screen where the user's cursor was positioned. *See* TSE 784. This combination of pre-defined order defaults and contextual screen information enabled rapid, error-free order entry.

69. One dynamic item in a trading order whose use differs significantly depending on the nature of the trading work flow is the order size. For example, systems which are directed at individuals who are primarily involved with entering orders on behalf of others may not always make effective use of an order size default. Each customer passing an order to such a broker will typically determine the size of that order based on their own trading objectives. The TSE system was directed primarily to users who typically did not trade in default sizes in Japan. *Kida Dep. at 129.* Conversely, systems which are directed at individuals who are primarily involved with their own proprietary trading frequently trade in standard order sizes such as 5, 10, 50 or 100 contracts. For these individuals, it is sensible to provide a mechanism to set an order size default before an order is placed. However, such an order size default function when used by an order intermediary for a customer could actually result in a higher error rate and slower speeds due to the need to change the default order size to the customer specified size each time an order is processed. The decision to provide an order size

default or not is one of many design decisions that developers of such trading interfaces regularly make in an effort to provide the best possible fit for their customer's needs.

*x. **GLOBEX2 (1998)***

70. In 1998, the CME released its next generation Globex exchange called GLOBEX2 which is a global 24-hour electronic trading system. One of the major advances that was proposed and implemented by the CME in the introduction of GLOBEX2 was the introduction of a trading API which would allow members and ISVs to develop customized trading interfaces for particular purposes. This trading API was in addition to the trading interface provided by the CME which was called GL WIN and developed by GL Trade. One reason the CME acquired this software because of its desire to obtain a trading system, which offered enhanced functionality and user-customization capabilities. The ability to tailor a trading window display to a trader's own needs was major attribute of the software. The Complete Globex2 Handbook, dated July 1998, at 1.1-1.2.

71. The GL WIN front end for GLOBEX2 had several different trading windows including, for example, the Market Watch Window, which provided information for all instruments in a one-line or two line per instrument format, and the Market By Orders Window, which allows the user to view the entire market depth of the book for a given instrument. *See* The Complete GLOBEX2 Handbook, at 4.1-4, 9.1-3. The Market By Orders Window is shown below.

The **Market By Order** window displays the following information for the entire depth of the market:

- ☐ Bid/Ask Order price
- ☐ Bid/Ask Order quantity
- ☐ Bid/Ask AON flag (FOR FUTURE CME USE)
- ☐ Trader order number (TON)

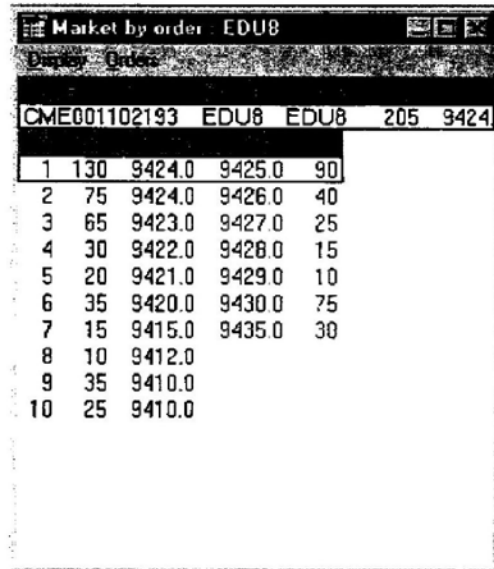
The **Market By Limit** window displays the same information aggregated by limit. Again, the entire depth of the market is available.

The **Cumulative Markets** window displays the first two limits aggregated with the average price for each quantity.

☞ For the remainder of this chapter and manual, these three displays are referred to as **Market By Order** window, although the features and functionality described applies to all three window displays.

Mouse Trading

Users can quickly trade from the **Market By Order** window by using *mouse trading*. Once mouse trading is activated, when you *right click-on* the quantity for either a bid or offer, that total quantity will automatically be populated in the order entry box with the price required to get that quantity. Likewise, when you *right click-on* the bid or ask price, that price will automatically display with the user's default quantity populated. Then, you can simply *click-once* with the left mouse button to quickly submit the order to the market.



The screenshot shows a window titled "Market by order : EDU8". Below the title bar, there are two tabs: "Display" and "Orders". The main content area displays a table with the following data:

CME001102193 EDU8 EDU8 205 9424					
1	130	9424.0	9425.0	90	
2	75	9424.0	9426.0	40	
3	65	9423.0	9427.0	25	
4	30	9422.0	9428.0	15	
5	20	9421.0	9429.0	10	
6	35	9420.0	9430.0	75	
7	15	9415.0	9435.0	30	
8	10	9412.0			
9	35	9410.0			
10	25	9410.0			

GLOBEX2 Handbook at 9.1.

72. The July 1998 GLOBEX2 Handbook describes the ability for the user to customize the workstation, including the window font and colors. GLOBEX2 Handbook at 3.7. The Font dialog box allowed users to change the size and look of the print displayed on the window. GLOBEX2 Handbook at 3.8. The Colors dialog box allowed the user to change the color of the print and/or background displayed in the window, such as the bid or ask quantity. The GLOBEX2 Handbook also describes the ability of traders to set defaults for their order entry boxes such as the default quantity. GLOBEX2 Handbook at 5.16. The user also can define the criteria for the pop-up window, including a first or second level warning. GLOBEX2 Handbook at 5.17.

73. GLOBEX2 gave the user the option to trade using a mouse. GLOBEX2 Handbook at 5.17. If mouse trading was activated, users could trade from the Market Watch, Market By Order, Markey By Limit, Options, or Instrument Summary windows. To trade, the user right-clicks on the quantity for either a bid or offer. That quantity will automatically be populated in the order entry box with the price required to get that quantity. When the trader right-clicks on the price, the Limit field always defaults to the displayed price with the user default quantity. An order entry box will display with both the quantity and the price already populated. The mouse pointer will be positioned on the SEND button in the order entry box. Then the user clicks once on the left mouse button to submit the order to the market. GLOBEX2 Handbook at 5.17.

B. TECHNOLOGY CONSTRAINTS, MARKET CONSTRAINTS AND USER EXPERIENCE IMPACTS THE DESIGN OF USER INTERFACES

i. Technology Constraints And User Experience Impacts User Interface Design

74. The earliest electronic trading systems were developed in an environment with significantly different technology constraints than exist today or in the late 1990s. For example, the communications bandwidth which was commonly available between a central system and the premises of an individual user was in the range from 1200 baud to 4800 baud (bits per second). In terms of character transmission speeds, these baud rates are equivalent to 120 to 480 characters per second. By the late 1990's communication speeds were typically 56,000 or 64,000 bits per second, an increase of 50 times over the earlier speeds. Additionally, the devices which were available to be situated at end user premises were not the high speed personal computers which were commonplace by the late 1990s, but rather in some cases were so called "dumb terminals" such as IBM 3270

displays or DEC VT100 displays which were not capable of running an application program. These displays typically had resolution measured in terms of the number of characters across and the number of lines vertically, such as 80x24, as opposed to the resolution of more modern graphical displays which are typically measured in terms of pixels in the horizontal and vertical axis. The graphical displays of the late 1990s were capable of displaying much more information than the 80x24 dumb terminals of the first generation.

75. An additional factor weighing on system design for electronic trading systems in the late '80s and early '90s was that the lack of experience in the marketplace with these systems gave rise to significant discomfort among both the users of the systems as well as the regulators in some marketplaces. In particular, regulators and users were concerned with guarantees that the systems would provide a so-called "level playing field" that would not preference any one user over the other users of the system. This concern, among other things, gave rise to a pervasive philosophy that the electronic system should provide the identical displays to all participants in the marketplace. By so doing, one possible source of differential advantage was removed. As will be discussed later, over time, as people became more comfortable with electronic trading this attitude completely disappeared and it became the norm that market participants could select from a wide range of display technologies provided by themselves, by the system, or by third parties.

76. Thus, when it became necessary for designers of an electronic trading system to design the single display which would be used by all users of the system, all of the considerations regarding the capabilities of the hardware, the bandwidth available, the

screen real estate and graphical display capabilities, the sensitivities of the market place, the workflows of the target users, and the structure of the instruments themselves, were relevant factors weighing on the design decision.

77. The foregoing discussion highlights the principal issues that designers of trading systems had to address with respect to the display of dynamic market information in the late 1980s and early 1990s, while technology was less capable and user experience was limited. The second major function of a trading interface is order management and in the design of this function there were additional issues and sensitivities. As stated earlier, the standard for comparison referenced by prospective electronic trading system users was their experience in handling of orders by human intermediaries. The key sensitivities revolved around speed, accuracy, and certainty. In a non-electronic market, intermediated by people as opposed to machines, there is typically a personal relationship between individual traders and their brokers and/or counterparties. Among other things, these personal relationships gave rise to an understanding between participants of the typical characteristics of an order placed by any one party. For example, if I as a trader typically place orders with my broker for five million dollars and my broker believes he or she heard me place an order for 50 million dollars, that broker would almost certainly question me as to my intent and would very quickly repeat that order back to me for verification prior to executing it. This level of human to human understanding gave traders significant comfort that they would not be accidentally misrepresented in the marketplace. Additionally, because the broker knew my name or my phone line, it was typically not necessary for me to identify my trading institution or my location or any relevant settlement instructions. At any given point in time, a trader might have multiple

orders placed with a broker and that trader had a very fast way to instruct the broker to remove all of his or her orders from the marketplace. Typically, this was done with a single word such as "off" or "out". In some markets, it was common practice for the broker to automatically consider that all bids and offers were subject to further reconfirmation by the dealer prior to execution if it was known that a significant event in the marketplace was scheduled such as an announcement by the Federal Reserve which was likely to have impact on interest rates or bond prices.

78. The designers of electronic trading systems needed to replicate to the extent possible many of these features of the non-electronic trading environments. For example, it was a common feature of electronic trading systems to provide a method for traders to provide default trading information to the system prior to entering their orders. The most common information in trader defaults included default instrument, default trade size, default price increment, default settlement institution, and default delivery instructions. By providing this information in advance, the electronic trading system was able to utilize the information at the time of order entry or execution without requiring the end user to engage in unnecessary input steps. In this way, it mimicked the information which was known by the voice brokers.

79. Take the GLOBEX system that was launched in 1992 as an example. Each trader could setup a default profile with the following information: default trade size, default price increment, default clearing information, default custom page. Since all of this information was stored in the computer prior to entering an order (in much the same way as a broker had personal knowledge of a trader's preferences and practices), less information was required at the time of order entry. By storing the "default size" the

system could suggest the size to the trader and relieve him or her of the step of entering the numerical data. By storing the “default clearing data” the system could fill this information into the electronic order and ensure maximum speed and accuracy. In many cases a trader could simply press one or two buttons and execute a transaction, as fast as he or she could perform the same operation with a voice broker.

80. Order cancellation is a time sensitive operation of a trader and a trading system. The moment a trader perceives that prices are moving in an adverse direction, that trader may want to instantaneously remove all of their orders, all of their orders in a single instrument, all of their bids, or all of their offers in the most expeditious manner possible. Again, the benchmark for comparison was a single monosyllabic word shouted down a phone line. The electronic analog to that process was generally a large prominently located key on a keyboard with a legend such as CANCEL. By striking that single key the system would cancel all active orders for that trader. Such functionality was present in, for example, GLOBEX, Dealing 2000-2, MINEX and LIFFE APT.

81. The display of electronic markets utilized additional visual clues to assist traders in unambiguously understanding the meaning of the numbers on the screen. These visual clues included position, color, and special font attributes. For example, it was commonplace to display a new price in the market utilizing a flashing font for a period of time in order to draw the trader’s attention to the newly arrived data. Electronic trading systems such as SOFFEX (1988), GLOBEX (1992), EBS (1993), MINEX (1994) all used font attributes to indicate activity in the electronic market. Additionally, several electronic trading systems had the ability to differentiate between bids, offers and trades

using different color fonts and/or background colors, such as LIFFE APT, IPE and Project A (Aurora).

ii. User Types and Work-Flow Impact Design Decisions.

82. The work flow of the end user impacts how user interfaces for trading are designed. Consider, for example, the work-flow of a broker at a firm which is a member of an exchange. This broker is normally involved in handling orders which are received by telephone from end users such as institutional traders, individuals, or corporations. This broker must be able very quickly to provide a best bid and best offer price to his or her customer, and that customer might be interested in any of the instruments that are listed for trading on the platform. When the order is entered, the price may be given to the broker by the end user, or it might be a market order where the price is determined by the state of the market, and in some cases, additional order qualifying information must be entered at the time the order is placed (such as good-till-cancelled, or session-order).

83. In such a business work flow, a broker is most concerned about the speed in viewing information across a wide range of possible instruments, in transcribing details received by phone into an order placement form, in notifying his or her customer as to the state of that order at different points in its trading life and the complete avoidance of errors in the handling of the order. Subsequent to order placement, a customer may contact the broker and request that the order be modified in price or size or may request that the order be cancelled. The quality of service of the broker is measured in terms of how timely and accurate that broker is in executing the customer's instructions. In particular, if a broker fails to cancel an order or if he enters an order at a

price different from that which was requested by the customers, that broker may be liable to the customer for any losses that are incurred.

84. The trading systems such as GLOBEX, DTB, and SOFFEX for example were all designed to appeal to the powerful constituency consisting of the largest broker members of the exchanges. As such, the screen displays designed by these exchanges for their electronic platforms typically utilized the technologies for facilitating brokerage order flow. Some of these considerations in these designs included the ability to display large numbers of instruments on a single screen with the most relevant information (best bid, best offer, last trade) shown for all of the instruments on the display. The market grid style of display was desirable because it allowed the display of multiple instruments concurrently. Additionally, in order to provide an effective method for a broker to provide more detailed information about “resting orders” in the book, i.e., those bids and offers that were not the best, such displays could often display a compressed order book along with the market grid.

85. A very different work-flow is seen in the pattern of activity of an active professional trader, i.e., a proprietary trader. Such a user might be trading speculatively in a single instrument or might be responsible for his or her own orders. A proprietary trader does not typically interact with customer order flow, and is most concerned with the depth of information available for a single instrument order book. Such traders also are extremely sensitive to the orderly conduct of the market at times of market stress. If the Federal Reserve announces a change in interest rates, this could create huge volatility in certain financial products and the moment of that volatility presents an opportunity to a

proprietary trader to profit handsomely. Such a user is concerned about the speed and accuracy of entering his or her own orders once a decision to trade has been made.

86. With respect to screen displays for presentation of detailed order book information, the professional trader is best served by a display which maximized transparency, i.e., the ability to see detailed information about the orders and transactions in a given market and was less concerned with information density and/or the number of instruments concurrently on display. Throughout the 1980s and early 1990s, there was academic research into the effects of increased transparency in the financial markets. For example, the illustrations below during the period from 1986 to 1994, are a sample of some of the publications which discussed transparent central order books and utilized vertical price axes to depict such information:

The following example illustrates this paper's market making protocol. Suppose the market maker's book of limit orders at a period's start is given in columns 1 and 2 below. These columns give the quantities and prices of limit orders (incremental and total) that are placed at the beginning of the period. Thus, a buy order for 200 shares is placed at 50 1/4 but 400 shares (200 at 50 1/4 and 200 at 50 3/8) is the total limit demand at 50 1/4. If buy and sell limit orders are placed at the same price, they are simply crossed. Thus, they do not affect the analysis and do not appear in the example. Columns 3 and 4 give the specialist's expected market buy and sell orders.

Prices	(1)		(2)		(3)	(4)
	Limit Buy Orders		Limit Sell Orders		Expected Market Buy Orders	Expected Market Sell Orders
	Incremental	Total	Incremental	Total		
50	200	800				
50 1/8	200	600			300	200
50 1/4	200	400			200	200
50 3/8	200	200			100	200
50 1/2					100	200
50 5/8			100	100	100	300
50 3/4			100	200	100	400
			100	300	100	500

O'Hara, Maureen & Oldfield, George, "The Microeconomics of Market Making,"
Journal of Financial & Quantitative Analysis, Dec. 1986, at 361.

Table V Market-Making in Japan

<i>Ask</i>	<i>Price</i>	<i>Bid</i>
3000	85	
1000	80	
2000	75	
5000	70	
	65	
	60	
Firm 1000	55	1000 Customer
	50	
	45	2000
	40	3000
	35	

Lindsey, Richard R. & Schaede, Ulrike, "Specialist vs. Saitori: Market-Making in New York and Tokyo," Financial Analysts Journal, Jul/Aug92, Vol. 48, at 48.

CLOSE:	50.25	* ABC *	HIGH:50.30
OPEN:	50.20	LAST: 48.95	LOW:49.80
BIDS		PRICE	OFFERS
		50.15	5,000
		50.10	1,000
		50.05	10,400
		50.00	600
		49.95	
		49.90 —	1,500
		** 49.85**	
		49.80	
		49.75	
2,000 —		49.70	
1,400		49.65	
11,000		49.60	
200		49.55	

Medelson, Morris & Peake, Junius, "Intermediaries' or Investors': Whose Market Is It Anyway?", *Journal of Corporation Law*, Spring 1994, at 443.

87. As can be seen in INTEX, LIFFE APT Order Summary Display Window, and illustrations from publications, the vertical (ladder) display, which arranges bids and offers along side a price axis clearly depicts three aspects of information: the price, the market side, and the quantity. By placing bids and asks to the side of the price axis as in a vertical (ladder) view, it reduces the risk of confusing a bid with an offer or vice versa and adequately displays the market depth.

88. In 1986, I was responsible for designing a generic architecture for electronic trading which could be used for trading in multiple asset classes. This architecture, which was known as the Reuter Dealer Trading System ("RDTS"), was

eventually used to develop electronic trading systems including GLOBEX (for exchange-traded futures and future options), Dealing 2000-2 (for Spot Foreign Exchange) and Dealing 2000-3 (for Forward FX). The RDTS architecture supported the concept of a central limit order book whose “depth of book” could be configured differently for different markets. The RDTS architecture additionally supported the concept that the depth of book which was available to market participants for display could be different from the depth of book held in the central limit order book (or “CLOB”). In the course of inventing and designing this architecture, it was necessary for the developers of the system to depict the changes which take place in a central limit order book when new bids and offers are presented to an existing order book and when matching takes place and orders are implicitly cancelled in such an order book, and how these changes should be reflected on the screens of system users.

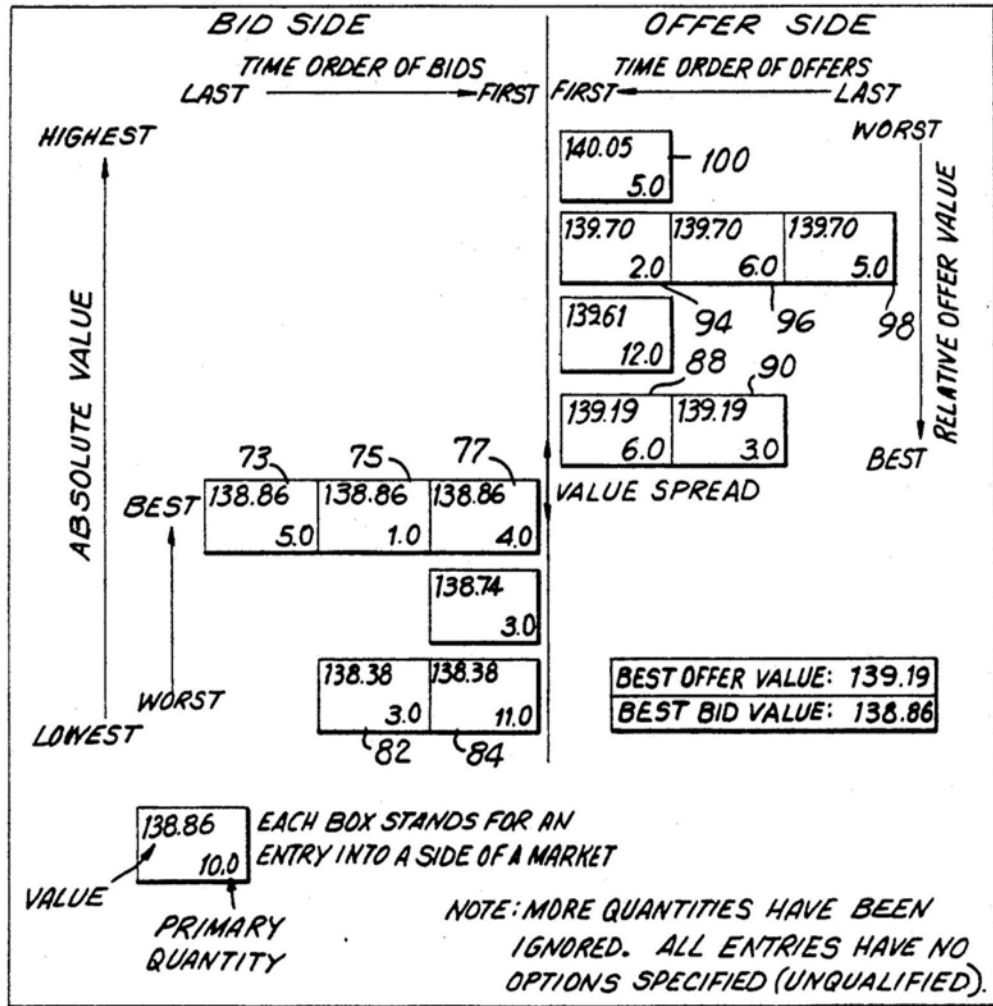
89. The developers of the RDTS system utilized a method of depicting dynamic order books which was learned from market experience with systems such as INTEX, and from publications such as the ones cited earlier. The method was to depict a continuous range of prices in a vertical orientation and to use this price axis as the reference point for illustrating where new bids and offers would be positioned by order processing logic. Additionally, this method of depiction was used to show how the best bid and best offer changed as a consequence of matching, order cancellation, order modification, or entry of a new order. In the display, the price display remained fixed and showed changes in the order book by the presence or deletion of orders with reference to that price depiction.

90. Two additional methods for displaying order book information were utilized by me during the design of the RDTS architecture. One of these methods utilized two columns of information: one column for Bids and one column for Offers. Typically the Bids would be on the left-hand column with the Best Bid at the top, and the Offers would be on the right-hand column with the Best Offer at the top, aligned on the same row as the Best Bid. This was a more compact method for showing limited depth of market.

91. The third method for displaying order book information was to utilize a single line of display, with the Best Bid Price and the Best Offer Price aligned side-by-side. This method of display was most compact however it did not allow for display of any market depth information.

92. The display method described in paragraph 89, above, utilized a static array of sequential prices, arranged on a vertical axis. The use of a static price display for illustrating changes in an order book was used because the use of a price display that changed as the orders changed required significant redrawing of the display which did not add anything to the understanding of the content. This method of illustrating changes in an order book eventually was used to illustrate some of the concepts in the patents which I filed on the inventions developed for RDTS. For example, the following images are extracted from U.S. Patent Nos. 5,077,665:

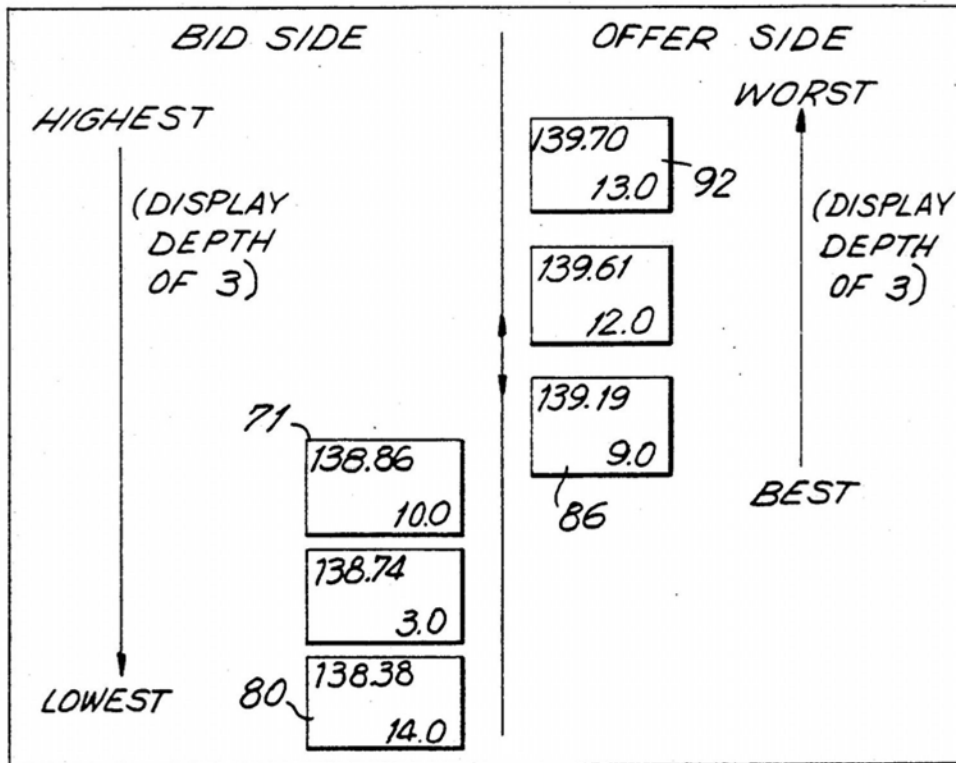
FIG. 4
CENTRAL STATION BOOK



The figure illustrated above includes a set of bids and offers, arranged in Price/Time priority sequence, where the vertical axis is the common price axis for the order book. Each order has an associated Price, Size, and its position in the left/right direction indicates relative time priority (orders closest to the price axis are older than orders, at the

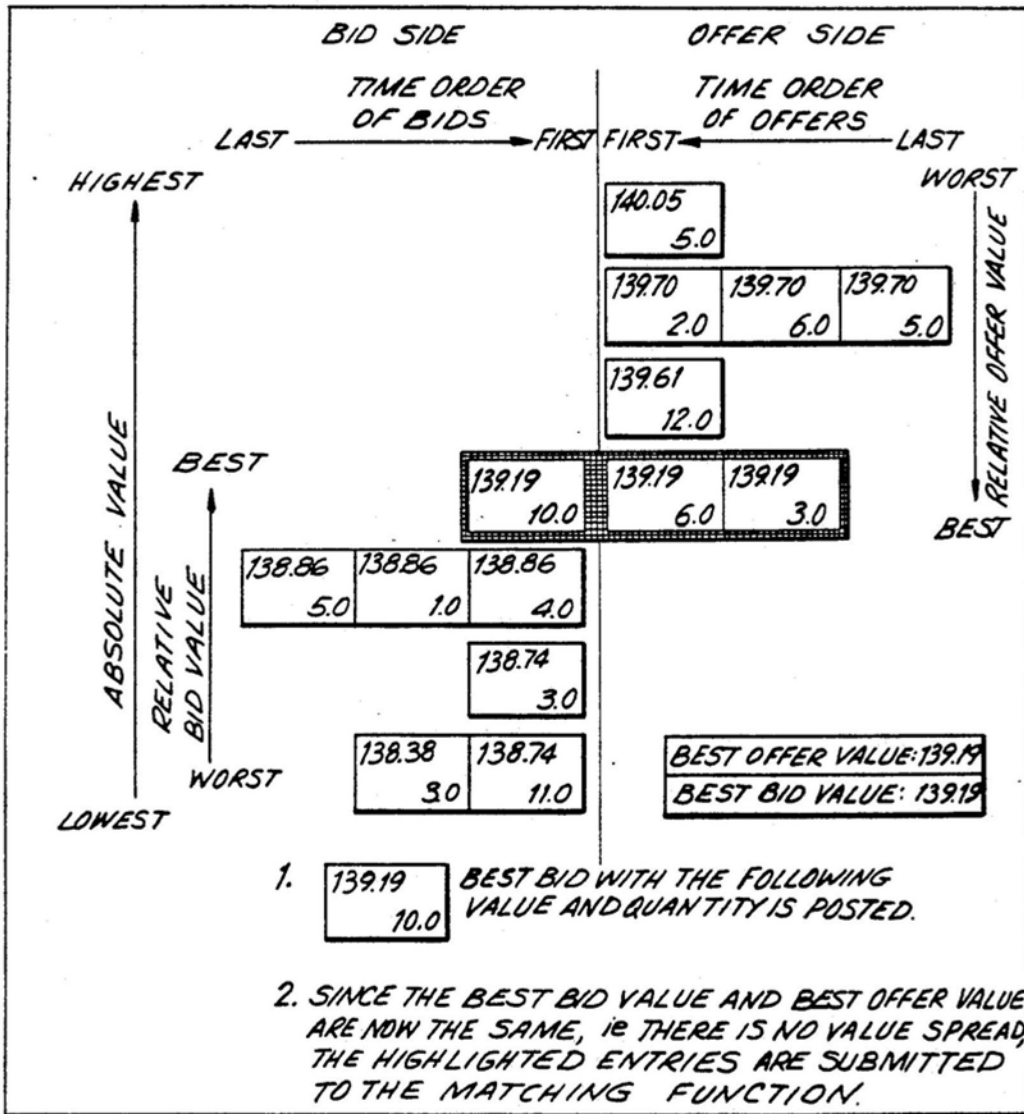
same price, which are farther from that axis). The same patent illustrates such an order book when it is stored on a keystation of the trading system:

FIG. 5
KEYSTATION BOOK



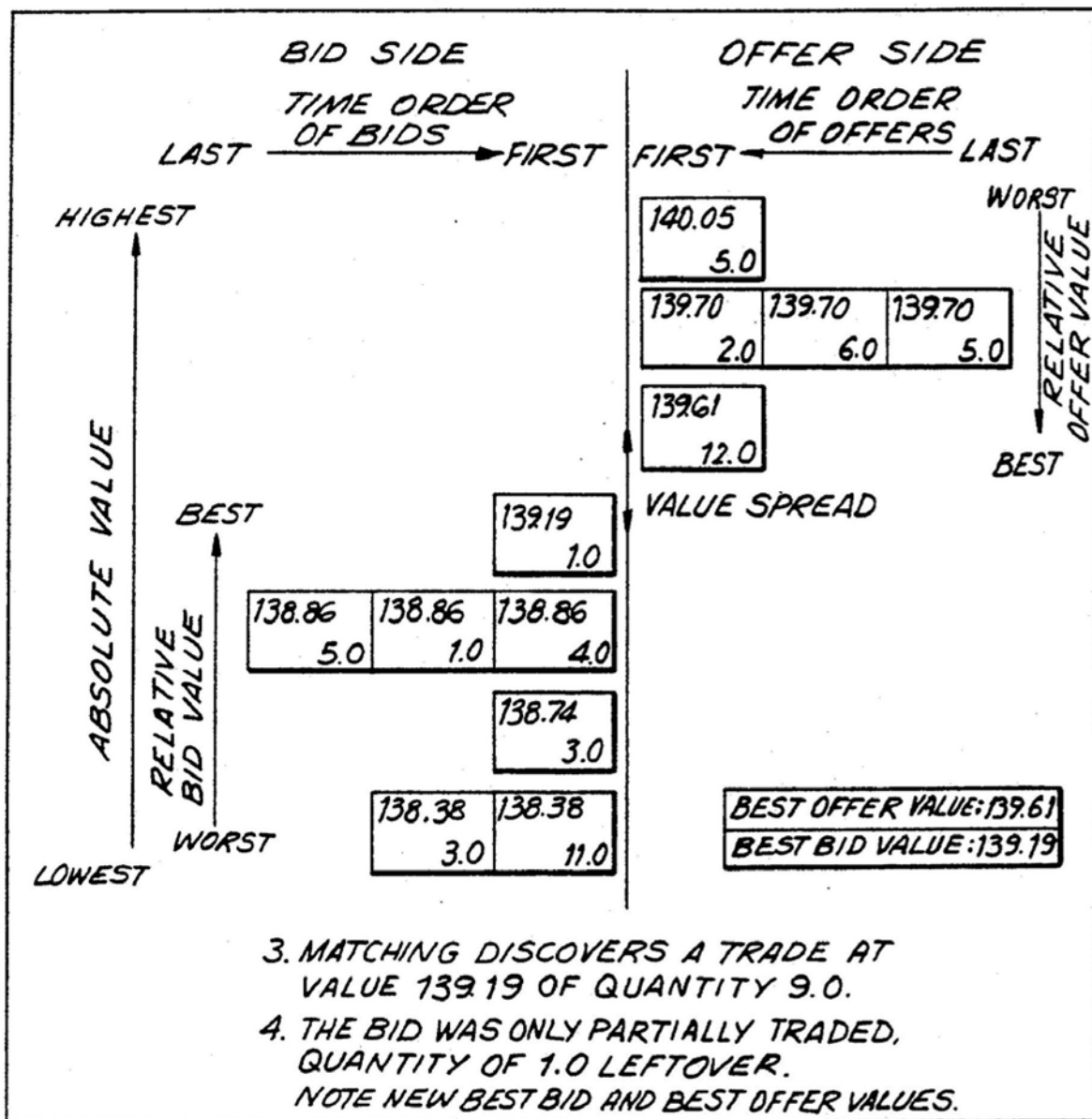
As can be seen in this illustration, all orders at the same price are aggregated in the keystation view of the order book, but the common price axis is maintained as the principal organizing element of the data. Finally, the two illustrations below, from the same patent, illustrate how the order book changes as a result of a matching transaction:

FIG. 17



In this illustration the price axis ranges from 138.38 through 140.05 and the inside market is 139.19/139.19. The legend indicates that since the best bid and best offer value are equal the order book will be submitted for matching. After matching the resulting inside market is 139.19/139.61 and the order book is shown with the same price axis, as indicated below:

FIG. 18



93. In fact, this method of illustrating the changes in a dynamic market utilizing a vertical price axis as the common reference point for bid and ask quantities was such an effective tool that it was used in subsequent publications, such as the

GLOBEX User Manual of January 1997, to illustrate concepts relating to market dynamics. (ES0070029).

94. At the time the Globex display was being defined, user interface design options including display of all price levels regardless of the presence of an active bid or offer, display of entire book as opposed to just the best bid or best offer, and the update frequency for the book display were all actively discussed. Vertical market displays showing full depth of book were considered. In some displays and for some purposes, such a method of displaying an order book is effective particularly where the end user is focused on a limited number of instruments.

95. However such a display consumed too much screen real estate and too much bandwidth to be practical given the technology constraints and user requirements for GLOBEX. It was clear from looking at such a display that there is significant "wasted" space in as much as the space opposite the bid quantities and offer quantities can be, and often is, blank. For those applications and end users where information density is a critical consideration and where screen "real estate" is limited it would not be sensible to incorporate a display with so much wasted space.

96. In order to recover the blank space in the vertical price axis display, it is possible to "fold" the display at the point where the bids prices meet the offer prices. In so doing, a new display is created containing the same information. However, in this case, the best bid sits alongside the best offer at the top of the display and the bids and offers inferior to the best sit below the top in price priority sequence. The illustrations below depict these two methods for displaying the same information and illustrate the savings in screen real estate achieved by the latter method.

Bids	Price	Offers
	105	175
	104	300
	103	
	102	25
	101	100
25	100	
200	99	
	98	
75	97	
1000	96	

Bids	Bid Prc	Ofr Prc	Offers
25	100	101	100
200	99	102	25
	98	103	
75	97	104	300
1000	96	105	175

C. THE INTRODUCTION OF TRADING APP'S AND EMERGENCE OF ISV'S IMPACTED THE DESIGN OF TRADING USER INTERFACES

97. As experience with electronic trading grew and as stakeholders came to realize that the benefits of electronic trading far exceeded any perceived added risks, many of the early precepts that dictated for closed systems, single user interfaces, and end to end control by the exchange of the trading environment disappeared. Within five years of the launch of GLOBEX, the CME decided that it no longer needed to control the single interface through which end users traded on the exchange and in its place, the CME would provide a trading Application Programming Interface (“API”) which allowed individuals and organizations to build the trading interface which was best suited for their individual needs. At the same time, the regulatory agencies had reached a sufficient level of comfort with electronic trading to not object to the possibility of

computer to computer trading. This change in philosophy created an opportunity for Independent Software Vendors (“ISVs”) to develop styles of user interface particularly suited to the needs of an individual type of trader. The April/May 1999 issue of Futures Industry Magazine summarized this change in the following words:

APIs provide the ability to interface one program or system with another. The API itself can have functionality. Some APIs had more functionality than direct access, others less—the evolution of the electronic trading systems explains it somewhat. Legacy futures systems developed pre-1997 were not designed to offer APIs. Exchanges initially offered terminals, but as electronic trading systems proliferated, trading desk real estate became scarce. FCMs complained that they didn't have enough terminals in busy market periods and too many if markets were slow. FCMs wanted the ability to access multiple exchanges from one computer terminal that they could buy off-the-shelf. APIs make that possible.”

Futures Industry Magazine, April/May 1999.

98. The use of APIs to facilitate the design and creation of customized software applications was well known in the world of financial information. One of the pioneers in the introduction of APIs for financial data was Reuters, who first introduced protocols for the distribution of logical market data in 1987 (see, for example, U.S. Patent Nos. 4,750,135, “Method for dynamically creating a receiver definable local trading instrument displayable record from a remotely transmitted trading instrument common data stream”). These early financial content APIs were typically restricted to the display of trading data as opposed to the actual interactive, two-way, trading APIs subsequently used for electronic trading. Nonetheless use of these financial information APIs had taught the benefits of enabling customization of user displays in order to more precisely match the needs of individual types of end users.

99. For example, an individual who is a direct exchange member and who actively trades a proprietary, self-directed portfolio has a set of needs which are quite

different from a broker in a FCM who is only responsible for taking and executing orders from his or her non-member customers. A hedge fund which utilizes algorithmic trading models has a need for a trading interface which is different from both the FCM and the proprietary trader. Some firms have proprietary risk management or order management systems, and the ability to interface these systems to an exchange-provided electronic trading platform was seen as beneficial for all parties involved.

100. By 1997 the CME was actively talking about open interface options for the GLOBEX2 system. In Europe, GL Consultants (later known as GL Trade), and OM Systems (later known as ORC) had begun to develop proprietary trading applications for the electronic exchanges in continental Europe, including SOFFEX and DTB. As exchanges began to increasingly adopt use of trading API's beginning around 1998, the opportunity was created for a new generation of software providers to build software specifically targeted at the needs of niche groups of traders. Companies such as Patsystems, Trading Technologies, and GL Trade developed software packages designed to interface with the trading API's of one or more commodities exchanges and specifically targeted the needs of individual customer types. Thus, all of the factors referenced earlier which the designer of an electronic trading system needed to balance in designing the single graphical interface of an exchange's electronic trading system could be heavily influenced by the needs of a particular type of customer as opposed to the common denominator. Specialization in trading interfaces began to emerge as the standard paradigm for desktop trading access with the ISV developments for LIFFE Connect and GLOBEX2 in 1998.

101. In fact, this movement towards open interfaces for exchange provided trading systems was so successful, and the choices that it offered to end users was so appealing that when the LIFFE launched its second generation trading system in 1998, it opted not to provide any trading interface whatsoever but rather to create a certification program for any ISV who wished to provide an interface capable of trading on the LIFFE platform. The LIFFE publications in this time period (such as the Directory of Software Solutions for LIFFE CONNECT, Oct. 1998, and Feb. 1999) list a large number of providers all of whom were certified by LIFFE as capable of providing suitable trading technology. In place of providing a desktop interface for trading, LIFFE provided documentation for its trading API which was used by ISVs to develop their trading front end software (Application Program Interface (API) Reference Manual for LIFFE CONNECT, Release 3.0, Sept. 1998, and Release 3.1, Sept. 1998, and Release 3.2, Dec. 1998, and Release 3.3, Jan. 1999).

102. For example, LIFFE listed thirteen software vendors in October 1998 who were able to provide interface software for the LIFFE Connect trading system. This list consisted of Bloomberg, Datastream/ICV, EasyScreen, Front Capital Systems, GL TRADE, IRIS Investment Support Systems, OM Technology, PAT Systems, QT Software, Reuters, RTS Realtime Systems, Trading Technologies, and Trinitech Systems.

103. An additional benefit of trading APIs is that they allow a single desktop application to connect to multiple trading venues. Prior to the widespread adoption of APIs, it was necessary for a trader to have a single screen per electronic exchange with which he traded. Utilizing API technology, companies such as GL Trade, Patsystems, and TT provided traders with the ability to place orders on and execute trades with

multiple exchanges. “PATS was one of the first vendors to offer order routing to the Liffe Bund pits alongside the DTB Bund from a single screen” *See* “Banks gain hands-on approach,” *The Financial News*, August 24, 1998. The designers of user interfaces had at their disposal a wide array of examples in display of market information, order management methods, and effective designs for high volume trading, as discussed above.

104. The ISVs developed trading interfaces to open electronic exchanges for various kinds of traders, including active professional traders. For example, IRIS Investment Support Systems illustrated a trading interface for LIFFE Connect in October 1998 which incorporated the multi instrument market grid display. In December 1998, IRIS announced that it was “stripping back the risk management functionality to a basic position viewing in order to build a fast, intuitive, TRADING FRONT END (TFE) for futures.” *See* Frances Maguire, “Firms rush to make Liffe Connect decision,” *Banking Technology*, December 4, 1998. In the same article, it was noted that “Trading Technologies is one of many offering one click trading on a contract price or quantity.”

105. By February 1999, IRIS was illustrating a trading front end that in addition to the market grid display included an order book display with a vertical price axis as shown below:

Market Depth

Exchange: Life F | Product: H | Type: F | Expiry: DEC98 | Exercise:

Acc.V	Vol	Ask Pr	Au. Pr	Rank
376	40	98.00	96.297	6 of 6
338	20	97.20	96.095	5 of 6
316	50	97.00	96.025	4 of 6
288	120	96.20	95.841	3 of 6
146	30	95.90	95.547	2 of 6
118	18	95.60	95.455	1 of 6

ASK 100 at 95.40

95.20 for 20 BID

Acc.V	Vol	Bid Pr	Au. Pr	Rank
60	40	94.50	94.733	1 of 6
80	20	94.00	94.550	2 of 6
90	10	93.00	94.378	3 of 6
120	30	92.40	93.883	4 of 6
240	120	92.20	93.042	5 of 6
340	100	90.00	92.147	6 of 6

Market Depth Screen

DX 156, at 12.

106. GL Trade developed a vertical static price ladder in 1998 which it sought to include as part of the GLOBEX2 front end. This vertical window was called Trading Pad or Trading Pad. Two pictures of a version of Trading Pad that was part of GL WIN 4.31 and which I saw at the March 15, 2007 inspection in this matter is shown below:

Qty	Price	Stock	Price	Qty
1		BAY		1
User	Bid Qty	Price	Ask Qty	User
		34.53		
		34.52		
		34.51		
		34.50		
		34.49		
		34.48		
		34.47		
		34.46		
		34.45		
		34.44		
		34.43	600	
		34.41		
600		34.40		
		34.39		
		34.38		
		34.37		
		34.36		
		34.35		
		34.34		

10:25:56 AM

Qty	Price	Stock	Price	Qty
1		BAY		200
User	Bid Qty	Price	Ask Qty	User
		34.53		
		34.52		
		34.51		
		34.50		
		34.49		
		34.48		
		34.47		
		34.46		
		34.45		
		34.44		
		34.43		
		34.42		
		34.41		
		34.40	3000	200
		34.38		
		34.37		
		34.36		
600		34.35		
		34.34		

10:26:13 AM

Right click to select a quantity

This window had a vertical static price ladder, a dynamic display of the best bid and best ask, and single action order entry.

107. A January 1999 CME document indicates that GL Win version 4.31 was loaded onto the CME test system on January 26, 1999 by Bruno Spada of GL Trade for evaluation by the CME. DX 628; Bruno Spada Dep., 4/30/07, at 60-61. The CME document indicates that Trading Pad was part of the GL Win version which the CME evaluated. The CME document states that the Trading Pad was given to the CME and that it was useless for the CME locals. Christina Dobson of the CME explained what this meant:

Q. Now, going back to the first page, it refers to “Redesigned Bid/Ask box and next to that, NOT EVEN CLOSE, the Trading Pad was given to us by GL, this window is useless for our locals.” Do you know what that is in reference to?

A. Are you asking what I think this is in reference – what it might be in reference to?

Q. Yes.

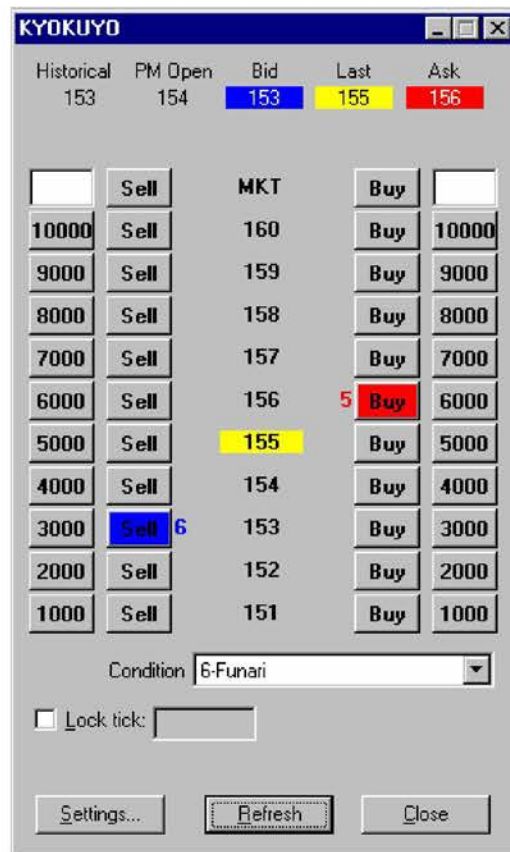
A. GL was giving us – we asked – CME had asked for a bid/ask box. We had specific requirements for how the bid/ask box should look and feel and function. GL tried to give us the Trading Pad as a substitute for that. To say the window was useless for our locals may or may not have been adequate – or accurate. However, I think that statement was made because it was not what was provided, the GL Trading Pad was not the bid/ask box and the requirements are very different. So even though it may or may not have been useless, we were looking for our bid/ask box that we, according to the way we specked it out.

Dobson Dep. at 52-53.

108. The CME decided, however not to use the Trading Pad as part of the GLOBEX2 front end. The Trading Pad representation of market depth was a significant departure from the visual style of GLOBEX (the original version). This may have been one of the factors which influenced the CME not to adopt the Trading Pad.

109. Similarly in Japan, ISVs were developed vertical static price displays with single action order entry targeted to the needs of their customers. One example of this is Midas Kapiti's Market Trader system and the Fast Order Entry window. The Fast Order Entry window showed a vertical column of prices, with best bid and ask quantities that would move relative to the vertical column of prices. In one setting of the Fast Order Entry window, the price column would re-center if the last traded price left the visual screen. Kida Dep., 5/17/07, at 30-32. In another setting of Fast Order Entry (when the "lock tick" button was checked and the center price specified), the price column would not re-center automatically – even if the inside market moved off of the visual screen – unless the user pressed the "refresh" button. Kida Dep., 5/17/07, at 32-35. To enter an order, the user would preset a quantity parameter by clicking on one of several

configurable quantity buttons. To send the order, the user would click once on one of several buy or sell buttons next to the desired price. Kida Dep., 5/17/07, at 36-39; Market Trader v. 5.2a Release Notes, DX 617, at 14-15. This interface component (FOE) is shown below from page 15 of the previously cited reference:



110. These developments in 1998 and 1999 illustrate the response of trading systems developers to the broadening appeal of electronic trading and the new capabilities enabled by advances in the underlying technology. It was no longer necessary to build a single style of interface appealing to a single type of customer work flow rather the exchanges offered interfaces with a selection of functional components and ISVs offered interfaces targeted at the specific needs of their target audiences.

D. DEVELOPMENT OF ORDER ENTRY TECHNIQUES FOR RAPID ORDER ENTRY FOR ELECTRONIC TRADING

111. Aside from the display of market information, the other critical factor in the early trading screens was speed of order entry. The trader had to be convinced that electronic trading permitted entry of orders as quickly and accurately as through pit trading. Throughout the period of development of electronic trading systems, developers and traders have been concerned with the speed with which trades can be entered.

112. One of the primary goals in designing GLOBEX, for example, was to provide a method of making trades that delivered the information that traders needed to make trades and to ensure that the trades could be made quickly and accurately. Initially, we experimented with voice recognition software. Eventually, we settled on the use of a specialized keyboard for sending trades to the market. To facilitate the speed of order entry, GLOBEX allowed a user to preset default parameters for trades, such as the type of order (market or limit order) and any conditions (fill or kill, for example). The ability to preset parameters allowed the trader to send orders very rapidly once he or she spotted a market opportunity. With the special GLOBEX keypad, the trader could touch two large buttons in rapid succession to send an order to the market.

113. At the time we were developing GLOBEX in the late 1980s, it was understood that the use of the keyboard would allow for faster order entry than the use of a mouse. Many traders were unfamiliar with moving a mouse cursor, and could execute a trade using the GLOBEX keyboard faster than the time it took to drag a mouse cursor across the screen and click on a particular location. Nevertheless, GLOBEX also supported the use of a mouse to enter trade orders.

114. Rapid order entry was a critical element in other early futures trading interfaces besides GLOBEX. Aurora and LIFFE APT (Automated Pit Trading) were two early interfaces for futures trading that attempted to display market information by simulating a pit trading environment. In order to enter a trade order in a short period of time, a trader could simply click on the icon of a trader who was offering to buy or sell a particular contract.

115. Rapid order entry remained a critical element through the mid-1990s. As time progressed, the mouse became a more popular input device for use with computers. Thus, more and more of the electronic systems developed in the mid-1990s featured the use of a mouse, rather than keyboards, to send trade orders. Orders could be accomplished through a minimum of mouse clicks with or without a confirmation window. For example, LIFFE APT and Aurora allowed for single click trading. In 1995, OM released software called OM Click that allowed a trader to enter an order with a double click of the mouse button. The Swiss Stock Exchange (1998) allowed a trader to enter an order by a click-and-drag feature with or without a confirmation window. GLOBEX2 (1998) allowed for the entry of orders through a single or double click of the mouse button with various levels of confirmation. TT's X_Trader (1998), a software package released by Trading Technologies for use on Eurex utilized single click order entry without a confirmation window. Patsystems (1998) gave the user the option of single click order entry without a pop-up window or to enter an order with a pop-up window. In the GL Trading Pad system in version 4.31, which had a static price axis, the user could enter an order with a single or double click of a mouse. In later GL WIN

version of Trading Pad, including 4.50 and 4.51, the user could enter an order with either two or three clicks of a mouse.

116. In the TSE system, all of the parameters of the order were filled upon a double click on the appropriate area in the screen except for the quantity. But as Mr. Kida explained, this was the appropriate way to enter an order for the type of traders that were using the TSE system because these users typically traded at different quantities, determined by their customers, not a default quantity. Kida Dep. at 129-30. This goes back to the work flow of the trader concerns as I discussed earlier in my report. For traders that do trade the same quantity repeatedly, setting a default quantity and sending the trade order in with a single or double click would be the faster way to trade as was done in the systems mentioned above. This is evident from the Midas Kapiti system which was directed to Japanese traders who typically traded default quantities. Kida Dep. at 129-30. This system had the ability to set default quantities and allow the trader to trade with one or two clicks of a mouse button. Market Trader v. 5.2a Release Notes, DX 617, at 14-15; 1998 User Guide, DX 618 at 11-12; Kida Dep. at 36-39.

117. Whether to use a confirmation window as part of the order entry process or not also relates to the work flow of the trader as mentioned earlier in my report. For example, the common practice among brokers is to repeat an order back to their customer prior to sending it to the exchange for execution. If the customer says “I want to buy 10 contracts for 101.35” the broker will repeat back “You are buying 10 contracts for 101.35” and when the customer says “yes” then the order is sent to the exchange. However, if the trader is his own customer (i.e. a proprietary trader), then this confirmation of the order details is unnecessary.

118. There were many well known examples in the art of user interface design to provide an option to enable or disable a confirmation step prior to committing a transaction. In the ubiquitous Microsoft Windows operating system, for example, ever since the Windows 95 version, there has been an option to enable or disable the confirmation prior to a user deleting a file (<http://support.microsoft.com/kb/185257>). Similarly, it has been taught since the mid 1990's that the needs of novice users are different from the needs of "virtuoso" users and the user interface must cater to these different needs. For example, this quote from 1998 addresses the topic:

It's important for new users that they feel safe. They don't trust themselves or their skills to do the right thing. Many novice users think poorly not only of their technical skills, but of their intellectual capabilities in general (witness the popularity of the "...for Dummies" series of tutorial books.) In many cases these fears are groundless, but they need to be addressed. Novice users need to be assured that they will be protected from their own lack of skill. A program with no safety net will make this type of user feel uncomfortable or frustrated to the point that they may cease using the program. The "Are you sure?" dialog box and multi-level undo features are vital for this type of user.

At the same time, an expert user must be able to use the program as a virtuoso. She must not be hampered by guard rails or helmet laws. However, expert users are also smart enough to turn off the safety checks - - if the application allows it. This is why "safety level" is one of the more important application configuration options."

"A Summary of Principles for User-Interface Design", Last updated: Friday, August 14, 1998, available at http://www.sylvantech.com/~talin/projects/ui_design.html

119. In the design of user interfaces for electronic order entry, the principle of allowing the user to select his or her own "safety level" found implementation in several interfaces prior to the critical date. For example, in Patsystems PTS Client, in March 1998, it was possible to disable the confirmation window to enable a single mouse click to send an order to an exchange. Alternatively, the user could keep the confirmation

window enabled, which required an additional click to send the order. *See* Nicholas Garrow Deposition, 5/26/05, at 32-33. Similarly, in March 1998 Midas Kapiti implemented a feature in Market Trader which allowed the user to decide between using a “confirm send” dialog box, or not, by selecting a user preference for this function, which was saved in the Windows NT registry and controlled the future behavior of the system. Midas Kapiti Market Trader Users Guide, March 1998, at G0105700.

120. Prior to TT’s invention, single action order entry was used in a wide variety of different trading screens as discussed above. By no later than March 1, 1999, single action order entry was a well established feature of electronic trading systems.

VI. THE CLAIMED TRADING SYSTEM OF TT'S PATENTS ALREADY EXISTED IN THE ART.

121. I have reviewed the ‘132 and ‘304 patents which are entitled “Click Based Trading With Intuitive Grid Display Of Market Depth.” I also have reviewed the provisional patent application that was filed in connection with these patents. I have reviewed parts of the file history of these patents. The '132 patent was filed on June 9, 2000 and issued on August 3, 2004. The '304 patent was filed on June 27, 2001 and issued on July 20, 2004. Both patents identify Gary Allan Kemp, II, Jens-Uwe Schluetter, and Harris Brumfield as inventors. Trading Technologies International, Inc. is listed as an assignee on both patents.

122. The patents state in the "Field of Invention" that "the present invention is directed to the electronic trading of commodities. Specifically, the invention provides a trader with a versatile and efficient tool for executing trades. It facilitates the display of and the rapid placement of trade orders within the market trading depth of a commodity where a commodity includes anything that can be traded with quantities and/or prices."

(‘132 patent, 1:12-18; ‘304 patent, 1:17-23). The Abstract of the patents refer to "a method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange." The Abstract further states that "The 'Mercury' display and trading method of the present invention ensure 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."

123. The "Summary of the Invention" in the patents states in part 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. In this embodiment the pluralities of bids and asks are dynamically displayed in alignment with the prices corresponding thereto." (‘132 patent, 3:11-20; ‘304 patent, 3:15-24).

124. The patents state that a single vertical or horizontal array of static prices has advantages over displays of market depth in which the bid prices and the offer prices are not arranged on a single continuous price axis. The patents claims that for some traders, the arrangement of prices as shown in Figure 2 of its patents maybe "considered counterintuitive and difficult to follow." (‘132 patent, 6:62-65; ‘304 patent, 7:16-19). The patent states that the invention "ensure[s] fast and accurate execution of trades by displaying market depth on a vertical or horizontal place, which fluctuates logically up or down, left or right across the plan as the market prices fluctuates" and "this allows the trader to trade quickly and efficiently." (‘132 patent, 6:65 to 7:2; ‘304 patent, 7:19-23)

The patent describes that the “inside market and market depth ascend and descend as the prices in the market increase and decrease.” (‘132 patent, 8:38-39; ‘304 patent, 9:4-5).

125. The patents further state that "as the market ascends or descends the price column, the inside market might go above or below the price column displayed on a trader's screen. Usually a trader will want to be able to see the inside market to assess future trades. The system of the present invention addresses this problem with a one click centering feature." (‘132 patent, 8:49-54).

126. With respect to order entry, TT claims that "in existing systems, multiple elements of an order must be entered prior to an order being sent to market which is time consuming for the trader." The patent goes on to say "such elements include the commodity symbol, the desired price, the quantity and whether a buy or sell order is desired." (‘132 Patent, Col. 2, lines 42-45). The patent describes that orders can be sent to the market with one click. (‘132 Patent, Col. 9, lines 50-55). The patent states that "using the right mouse button, an order would be sent to market at the price that corresponds to the row clicked for the total quantity of orders in the market Thus a right click in the AskQ column 1202 in the 87 price row will send a sell order to market at a price of 87 and a quantity of 150. . . . Similarly, a right click in the BidQ column 1201 at the same price level would send a buy limit order to market for a quantity of 5 at a price of 98." (‘132 Patent, Col. 10, lines 4-20). The patent further describes using a default quantity for trading. (‘304 Patent, Col. 8, lines 36-51).

127. The patent states the problem to which the invention is trying to solve: "The market is fluid as many traders are sending orders simultaneously. In fact, successful markets strive to have such a high volume of trading that any trader who

wishes to enter an order will find a match and have the order filled quickly, if not immediately. In such liquid markets, the prices of the commodities fluctuate rapidly. On a trading screen, this results in rapid changes in the price and quantity fields within the market grid. If a trader intends to enter an order at a particular price, but misses the price because the market prices moved before he could enter the order, he may lose hundreds, thousands, even millions of dollars. The faster a trader can trade, the less likely it will be that he will miss his price and the more likely he will make money." ('132 Patent, Col. 2, lines 50-63).

128. Independent Claim 1 of the '304 patent is illustrative and provides:

A method for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid price and a lowest ask price on a graphical user interface, the method comprising:

dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the highest bid price currently available in the market;

dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the common static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;

displaying the bid and ask display regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid or ask display regions relative to the common static price axis;

displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and

in response to a selection of a particular location of the order entry region by a single action of a user input device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.

The gist of this claim as well as the other independent claims of the patent relates to a dynamic display of bid(s) and ask(s) juxtaposed to a static price axis and single action order entry from the order entry region on the screen.

129. I have reviewed the Court's Memorandum Opinion and Order regarding the construction of disputed claim terms dated October 31, 2006 and February 21, 2007. Based on my review, I understand the Court has construed the claim terms of the '132 and '304 patents as follows:

- “*Static display of prices*” means “a display of prices comprising price levels that do not change positions unless a manual re-centering command is received.”
- “*Common static price axis*” means “a line comprising price levels that do not change positions unless a manual re-centering command is received and where the line of prices corresponds to at least one bid value and one ask value.”
- “*Price level*” means “a level on which a designated price or price representation resides.”
- “*Dynamic display*” means “a display of a plurality of bids and asks that are updated in response to new market information such that the bids and asks change positions relative to the static display of prices when the market changes.”
- “*Dynamically displaying*” means “updating the first (second) indicator in response to new market information such that the first (second) indicator changes positions relative to the common static price axis when the market changes.”
- “*Indicator*” means “something that indicates.”
- “*Order entry region*” means “an area comprising a plurality of locations where users may enter commands to send trade orders, and that each location corresponds to a price level along the common static price axis.”

- *“Single action of a user input device”* means “an action by a user within a short period of time that may comprise one or more clicks of a mouse button or other input device.”
- *“Common,” “corresponding to” and “aligned”* are all “used as synonyms for ‘in relationship with’.”

130. Although not explicitly limited with respect to the type of user the patents are directed at, the background of the invention speaks about features and functions that would be most significant to an active professional trader as opposed to, for example, a broker or order intermediary. For example, TT states that "a skilled trader with the quickest software, the fastest communications, and the most sophisticated analytics, can significantly improve his own or his firms bottom line." ('304 patent, 2:10-12). The background goes on to say "the more time a trader takes entering an order, the more likely the price on which he wanted to bid or offer may change or not be available in the market." ('304 patent, 2:51-54). This clearly is addressed to a user who is determining for himself the price of his bids and offers as opposed to a broker who is placing orders on behalf of someone else. Finally, TT states that "the faster a trader can trade, the less likely he will be that he will miss his price and more likely he will make money." ('304 patent, 2:65-67 (emphasis added)). Thus, although not explicitly limited, it is clear that TT had in mind the specific needs and expectations of proprietary, active professional traders.

131. By no later than March 1, 1999, with all of the experience that had been gained in the adoption and use of electronic trading across many types of user and many types of markets, it was clearly understood that the optimum form of interface and display for active professional traders was quite different from the optimum for brokers

and other order intermediaries. In particular, with higher resolution screen displays and higher network bandwidth availability in those markets in which activity was focused on a single or small number of highly liquid instruments, a display which communicated the available market information on a single instrument was preferable to one which opted to compress that information to preserve screen real estate. Examples of this included INTEX, Patsystems PTS Client, Midas Kapiti, GL WIN with Trading Pad, and IRIS.

132. As pointed out in the detailed description of the preferred embodiment "the exchange sends the price, order and fill information to each trader on the exchange. The present invention processes this information and maps it through simple algorithms . . . to a screen. The physical mapping of such information to a screen grid can be done by any technique known to those skilled in the art." '304 patent, 5:3-5. The patent goes on to state that "how far into the market depth the present invention can display depends on how much of the market depth the exchange provides." '304 patent, 5:8-10. In combination, these two statements of TT reinforce the point that TT is not claiming to have invented a display of the inside market or market depth per se nor the technology required to map this information onto a screen. The alleged invention is directed at a particular arrangement of information that is made available by the exchange.

133. But in my opinion, the layout of the arrangement of the prices, bids and asks in the TT patents was already known and had been used in the art long before TT. As for the display of a price axis juxtaposed to a display of bids and ask as shown in Figure 3 of the patents, this was old in the art and had long been in use prior to TT's invention. These prior art screens include INTEX, SPATS, LIFFE APT, TSE, TIFFE, OSE, SWX, GL WIN with Trading Pad, and IRIS as explained above. In fact, one of the

first electronic trading systems for futures, INTEX, used this vertical layout of prices juxtaposed to a display of bids and asks. The use of a vertical ladder of prices has been used since at least 1984 and remains in use today. It was an old feature in the art. TT was not the first to invent or use the vertical price ladder display of market depth for electronic trading.

134. TT's patents also are directed to a static display of prices juxtaposed against a dynamic display of bid(s) and ask(s). The Patent Office indicated that this element was one of the primary reasons for allowing the claims of the patent:

The primary reason for allowance is the limitation directed to the “dynamic display” of a plurality of the quantity of bids and asks aligned with a “static display” of corresponding prices. Here, unlike the prior art, the “static” display of prices is just that, static, and does not move in response to a change in the inside market. With this display of market depth, claimed in each of the independent claims, a trader places a trade order with the pointer in the area of the order entry region of the dynamic market depth region, through a single computer implemented action, see Figures 3 and 4.

135. However, this display was not new as of the critical date due to the TSE98, GL Win with Trading Pad, and Midas Kapiti Fast Order Entry screens as discussed above. In fact, the use of a static screen juxtaposed against a dynamic display of bids and asks was used in several markets in Japan prior to March 1, 1999. (Kida Dep., 5/18/07, at 323-29). TSE also published a User's Manual in August 1998 which describes in detail that its screen has a static price axis in the scroll screen mode. DX 179, at 753, 762. If a system that has automatic re-centering is included within the scope of the claim and is considered static as I understand TT alleges, then the basic board screen of the TSE also includes this element. DX 761. The use of a static vertical price ladder juxtaposed against a dynamic display of bid(s) and ask(s) had existed and had been

used before the critical date. It was an old feature in the art. TT was not the first to invent or use a static price ladder juxtaposed against a dynamic display of bid(s) and ask(s).

136. The ability to manually re-center a static price axis also existed in the art before the critical date of the TT patents. This feature existed at least in the TSE98, GL Win with Trading Pad, and Midas Kapiti Fast Order Entry electronic trading systems as described above. This feature also was described in the TSE 1998 Manual and the Midas Kapiti Release Notes. It was an old feature. TT was not the first to invent or use an electronic trading system that had the ability to manually re-center a static price axis.

137. As for single action order entry, this also was well known prior to March 1, 1999 and is found in many prior art systems as discussed above. Virtually every screen-based trading interface since the early 1990s incorporated design elements to allow for rapid order entry and rapid order cancellation. These design elements included contextual mapping based on the position of a screen cursor, pre-defined order defaults, and rapid user input through a series of clicks of key depressions. Whereas early systems in the 1980s and early 1990s utilized specially designed keyboards with large single-purpose trading keys (e.g. BUY or SELL), the systems developed after 1995 largely utilized single and double mouse clicks to achieve the identical equivalent effect. Integration of rapid order entry with effective market information display had been a common feature in trading systems dating back to the 1980s. Indeed, in 1975 the TAFEX provided a trade entry format which allowed the user to enter a bid into the market with as few as three keystrokes utilizing dynamic market information displayed

on the screen to provide the quantity and price for the order. *See* TAFEX Systems Corporation, Subscribers Manual (September 1975).

138. It should be noted that in many of these prior art examples as described above, the implementation of single action order entry involved the steps of storing certain order default parameters and clicking or selecting a price or quantity in a user interface. As explained above, single action order entry was applied to a variety of trading screens, including a static price axis, before the critical date. It was an old feature. TT was not the first to invent or use single action order entry. TT was not the first to invent or use single action order entry with a static price display and dynamic bid(s) and ask(s).

139. Other features of an electronic trading system recited in the dependent claims of TT's patents were well known and present in trading systems throughout the 1990s. These features include single action order cancellation, displaying the bids and asks in different colors, display of working orders, and the display of entered orders.

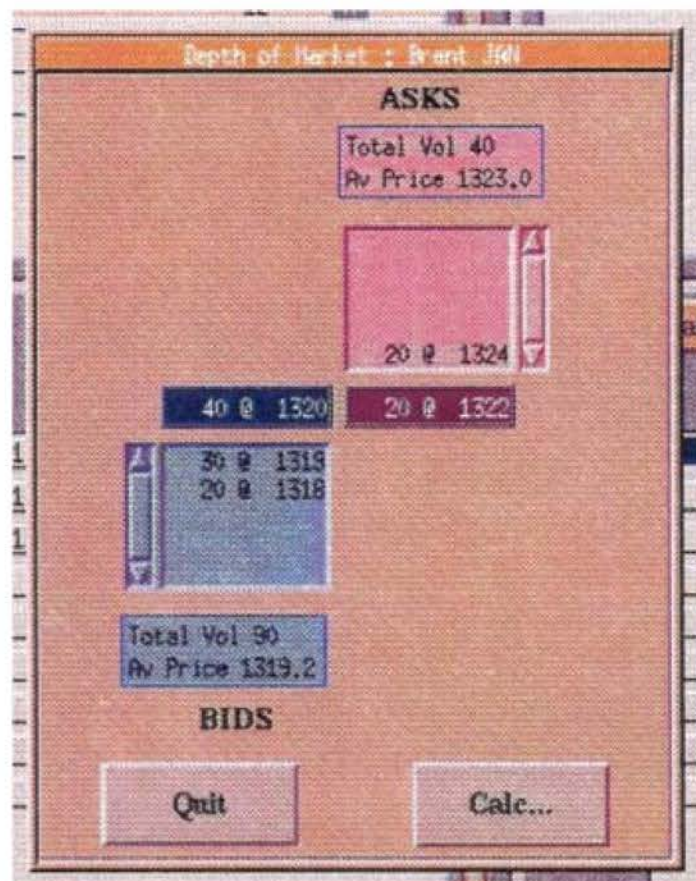
140. The ability to cancel orders is a necessary component of an electronic trading interface for the reasons stated earlier. For cancellation functionality, the key driver for user acceptance is speed and ease of use. Single-action cancellation was a feature of trading systems as early as TAFEX in 1974, albeit on a vastly more primitive trading platform. Single-action cancellation was a common feature on other exchanges such as GLOBEX, LIFFE APT ("At any time, a trader can immediately cancel individual bids or offers by using the "OUT" command.") (DX148); Minex 1992 Manual at pg. 12 ("press the cancel key to withdraw all displayed orders."); SWX ("To delete the order in the order book, Bianchi selects it . . . and opens the pop up menu. After clicking on

"delete" and confirming the intent to delete, the delete command for the selected order is transmitted to the exchange system.") (Man. p. 6-17); and GLOBEX2 (F8 and enter) (Globex2 Man. at 5.5). In addition, many ISVs included a single action cancellation of orders feature with their electronic trading systems before the critical date, including Datastream ICV (Liffe 1998 Directory) ("one click order removal"), Patsystems PTS Client (If the user wants to cancel an order, hit the cancel key and a prompt will appear to confirm), Communicating Ltd. (2/1999 Liffe Directory) ("Pull all button"), RTS (2/1999 ISV Manual) ("Panic button") and GL WIN with Trading Pad 4.31. Single action cancellation of orders was an old feature in the art and common on electronic trading systems. TT was not the first to invent or use single action cancellation of orders in an electronic trading system.

141. The feature of showing the bid and asks in different colors also was common in electronic trading systems. The TT patents say that "in the preferred embodiment of the invention, these three columns are shown in different colors so that the trader can quickly distinguish between them." (304 Patent, Col. 7, lines 61-64). Prior to the critical date, the use of colors to differentiate regions of a screen display had been practiced for many years in trading interface design for this very reason. U.S. Patent No. 5,297,031, which issued in 1994, describes the benefits of using different colors for the buy and sell orders: "[i]t is advantageous to show buy orders in blue and sell orders in red, and to outline the incoming orders pane in a contrasting color such as green. As described elsewhere, such color selection contributes to the ease of use of the invention." (Col. 11, lines 40-46). The benefit of colors also is described in a patent application directed to Friesen US 2003/0097325, "The offers 304 and the bids 300 are

displayed in different colors, shapes, textures or sizes, or other distinguishing visual characteristics, to allow the trader to quickly ascertain the current state of the market for this item." (Pg. 4, par. 37)

142. The use of colors to differentiate regions of a screen display had been practiced for many years in trading interface design. For example, the picture below is from an April 1994 brochure describing a new trading system for the International Petroleum Exchange (IPE):



143. Other electronic trading systems that used colors to distinguish between the bids and asks before the critical date include:

CBOT Aurora 1990 Manual ("this means that the total of the bidding icons equals the quantity being shown in the price display blue-shaded area, and the total of offering icons equals the quantity listed in the offer price display box.") (ES21232-41 at 37-38)

LIFFE APT 1994 Promotional Brochure (4th Pg. "offered volumes are shown against the traders mnemonic, in red, bid volumes in blue.") (DX148) (MacGregor Dep. at 21.)

Patsystems March 1998 DOM (Garrow Dep. at 73-74) ("Q: and with the hot quotes window, you can set the bid region to be one color and the offer region to be a different color? A: That's correct, yeah.") (see screenshot in Nov. 1998 Futures article)

GLOBEX2 Manual (p. 3.7-8) (the colors dialog box allows users to change the color including, for example, the bid quantity)

144. The use of colors to distinguish between the bid and ask quantities was an old feature in the art. TT was not the first to invent or use colors to distinguish between bid and ask quantities in an electronic trading system.

145. The display of working orders on the screen was used in electronic trading systems before the critical date. For example, the Detailed Order Book of the SWX trading screen had "O" columns next to the bid and quantity columns. The "O" column represented the traders own working orders. (Man. at 4-16) An asterisk in a price row indicates that the trader has an order working at that price. Other electronic trading systems display the users own working orders such as the DTB/Eurex system (Exchanges Put On New Game Faces, www.futuresmag.com, October 1998), GLOBEX2 in the GL Nego window, Pats PTS System and GL WIN as described in "A Trading Room With A View", November 1998. In addition, the GL Win 4.31 Nego window displayed working orders in association with the price levels along the static price axis.

146. Similarly, entered orders displayed on an electronic trading screen before the critical date was not new. As shown in the November 1998 article titled "Trading Room With A View", the GL WIN, X_Trader and Pats PTS Application all showed the entered orders of the user on the screen. Also, in an October 1998 article titled

"Exchanges Put On A New Game Face", the GLOBEX2 and OM ORC systems are described as having this feature.

147. The display of working and entered orders were old features in the art. TT was not the first to display working or entered orders on the screen.

148. As explained above and in further detail in the section below, in my opinion, TT's claimed trading system already existed in the prior art and included features and functionality that long existed and were commonplace on electronic trading systems before the critical date.

VI. THE GL WIN V. 4.31, 4.50 AND 4.51 WITH TRADING PAD ANTICIPATES MANY OF THE ASSERTED CLAIMS.³

149. I understand that a patent is invalid as anticipated under Section 102 of the Patent Code if a prior art reference discloses every limitation of the claimed invention.

150. In my opinion, asserted claims 1, 2, 3, 5, 6, 7, 8, 9, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 36 and 37 of the '304 patent are anticipated by GL WIN v. 4.31 with Trading Pad. The GL WIN v. 4.31 with Trading Pad discloses every limitation of the asserted claims. My comparison of the GL WIN v. 4.31 with Trading Pad to the limitations of the asserted claims is set forth in the claim chart as Exhibit 2.

151. In my opinion, asserted claims 1, 2, 3, 5, 6, 7, 8, 9, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 36 and 37 of the '304 patent are anticipated by GL WIN v. 4.50 with Trading Pad if the claims cover the use of a pop-up window as TT alleges.⁴ The GL

³ I have been asked to assume for purposes of this Report that GL Win with Trade Pad versions 4.31, 4.50 and 4.51, the Midas Kapiti Market Trader with Fast Order Entry, and the TSE98 legally qualifies as prior art.

⁴ If it is finally determined that pop-up windows are covered by the claims then no further analysis of the single-action order entry of GL WIN versions 4.50 and 4.51 is required. If, however, the court determines that pop-up windows are not covered by the claims, then adding single action to Trading Pad would have been obvious to one of ordinary skill in the art. The simplest analysis of this need look no further than GL WIN with Trading Pad version 4.31. That earliest version of the software did not have the pop-up

WIN v. 4.50 with Trading Pad discloses every limitation of the asserted claims. My comparison of the GL WIN v. 4.50 with Trading Pad to the limitations of the asserted claims is set forth in the claim chart as Exhibit 2.

152. In my opinion, asserted claims 1, 2, 3, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36 and 37 of the '304 patent are anticipated by GL WIN v. 4.51 with Trading Pad if the claims cover the use of a pop-up window as TT alleges. The GL WIN v. 4.51 with Trading Pad discloses every limitation of these asserted claims. My comparison of the GL WIN 4.51 with Trading Pad to the limitations of these asserted claims is set forth in the claim chart attached as Exhibit 2.

153. In my opinion, asserted claims 1, 2, 3, 7, 8, 9, 10, 14, 15, 16, 20, 22, 24, 25, 26, 27, 28, 30, 32, 34, 35, 36, 37, 38, 40, 42, 44, 45, 46, 47, 48, 50, 51, 52, 53 and 54 of the '132 patent are anticipated by GL WIN v. 4.51 with Trading Pad if the claims cover the use of a pop-up window as TT alleges. The GL WIN v. 4.51 with Trading Pad discloses every limitation of these asserted claims. My comparison of the GL WIN 4.51 with Trading Pad to the limitations of these asserted claims is set forth in the claim chart attached as Exhibit 2.

154. In addition to the GL WIN with Trading Pad software, I have reviewed the GL WIN version 4.50 User Guide for LIFFE Connect. I believe that this User Guide anticipates asserted claims 1, 2, 3, 5, 6, 7, 8, 9, 13, 14, 15, 16, 17, 18, 19, 20, 21, 27, 36,

confirmation window. Clearly the developers at GL Trade knew how to implement single-action without a pop-up confirmation, since they had already done the same. If, as one might reasonably speculate, the confirmation window was added to prevent the sort of error trades that had happened in other GL WIN versions (in July 1998 a trader at Salomon Brothers London office accidentally leaned on a keyboard which included an "Instant Sell" key, and cause a series of sell orders to be executed by the MATIF exchange, causing major disruption in the market) then it is also clear that the prior art had numerous examples of methods to render the use or not of a pop-up confirmation window as a user option as previously discussed.

37 of the '304 patent. The User Guide contains a description of the Trading Pad on page 23 that discloses a grid display with a price column, AskQty column, BidQty column, and User columns that are just like the features of the 4.31 and 4.50 software that I reviewed and discussed in the attached claim charts. The User Manual discloses a best bid and ask quantity in the respective AskQty and BidQty columns (*i.e.*, an inside market), and states that “the blue and green indicators within the price column will move according to the ebb and flow of the market.” These indicators are located next to the best bid and ask quantity. The only way that they could move within the price column would be if the price column remains stationary during the change in the market. In addition, there is no discussion of automatic recentering in the user manual. Additionally, the manual states on page 23 that “to input the desired quantity ... press the left-hand mouse button on the box” and “the quantity you have just entered will appear in the box you highlighted within the user column.” If the price axis were to move following this step then the quantity would no longer appear in the box which had been highlighted, but rather would appear in a new box. Since this is not the case, it is clear to me that the price axis described in the manual did not move automatically. In addition, the discussion of Trading Pad includes a description of single action order entry: “Once the preferred indicator reaches the price you wish to trade at, press the left-hand [sic] mouse button to send your order.”

VII. THE MIDAS KAPITI MARKET TRADER V. 5.2A WITH FOE ANTICIPATES MANY OF THE ASSERTED CLAIMS OF THE '304 PATENT.

155. In my opinion, asserted claims 1, 2, 3, 5, 6, 7, 8, 9, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 26, 27, 36 and 37 of the '304 patent are anticipated by Market Trader v.

5.2a with FOE Release Notes and the actual functional Market Trader v. 5.2a system. DX 617; Kida Deposition at 27-44. My description of this system is set forth above in paragraph 109.

VIII. EACH OF THE ASSERTED CLAIMS ARE OBVIOUS.

156. I understand that a patent is invalid as obvious under Section 103 of the Patent Code if "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." In making the determination of obviousness, I have been asked to consider: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the art. Additionally, I have been asked to consider various other considerations such as commercial success, long felt needs, failure of others, and praise by others of the invention and how that impacts my opinion on obviousness.

157. In determining obviousness, I have been asked to apply the following criteria which I understand are from a recent Supreme Court decision (*KSR v. Teleflex*):

- * the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results;
- * when a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious.
- * When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, section 103 likely bars its patentability;
- * If a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill;

- * When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance, the fact that combination was obvious to try might show that it was obvious under section 103;
- * The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way. In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends. Granting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility.
- * It may be necessary to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. The analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim for one can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.
- * One of the way in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims.
- * Any need or problem known in the field of endeavor at the time of the invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.
- * Familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. A person of ordinary skill is also a person of ordinary creativity, not an automaton.
- * When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of

ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under section 103.

I have previously set forth my opinion on one of ordinary skill in the art.

A. THE ASSERTED CLAIMS OF THE '304 AND '132 PATENTS RELATING TO MARKET DEPTH ARE OBVIOUS BASED ON GL WIN V. 4.31 AND 4.50 WITH TRADING PAD AND THE PRIOR ART DISPLAYING MARKET DEPTH.

158. The asserted claims 11, 12, 28-35 of the '304 patent and claims 1, 2, 3, 7, 8, 9, 10, 14, 15, 16, 20, 22, 24, 25, 26, 27, 28, 30, 32, 34, 35, 36, 37, 38, 40, 42, 44, 45, 46, 47, 48, 50, 51, 52, 53, and 54 (the "market depth claims") are obvious based on the combination of market depth with the GL Win v. 4.31 and 4.50 with Trading Pad.

159. The difference between the GL WIN v. 4.31 and 4.50 with Trading Pad and these claims is that these claims add the additional limitation of either dynamically displaying market depth, or dynamically displaying a third and fourth indicator representing quantity associated with at least one order to buy and sell the commodity at a price different than the highest bid or lowest ask price currently available in the market. In other words, these claims relate to showing part of the market depth.

160. The reason market depth is displayed on electronic trading screens is because the orders "behind" the best bid and the best ask, *i.e.* the bids at a lower price than the best bid and the asks at a higher price than the best ask, indicate to a trader where the "real market" lies. For example, there may be 10 contracts offered at the best ask of 99.00 but there may be 1000 contracts offered at the next best ask of 99.05. If a trader wants to buy 500 contracts, if he does not know of the offer at 99.05 he would not know the price he will need to pay for the 500 contracts. Thus, the market depth communicates

vital information to a trader who needs to execute larger trades than are shown in the inside market.

161. Accordingly, there were numerous examples of market depth available to the developers of the Trading Pad. Prior to March 1999 there were many examples of market depth display available in the market. These were provided by exchanges on their proprietary trading terminals, and by ISV's in their desktop trading software. The table below lists some of the examples of market depth displays prior to March 1999:

Exchange	Year
INTEX	1984
SPATS	1986
LIFFE APT	1989
GLOBEX	1992
MINEX	1993
IPE	1994
OM Click	1995
MEFF	1996
TIFFE	1996
CUBS	1997
OSE	1996
SWX	1996
TSE	1998
GLOBEX2	1998
CBB	1998
PATS	1998
GL Market Watch	1998
GL Market by Limit	1998
IRIS	1999

These examples illustrated vertical displays, “two-up” displays, scrolling displays, static displays, and many combinations of those types.

162. The desire of traders to have access to complete market information, for example, market depth information, was well known at the time I was involved in the specification and development of GLOBEX, in 1988. The traders on the floor of the exchange were aware of bids and offers behind the best bid and offer. If the GLOBEX screen only showed the best bid and best offer then the users of GLOBEX would feel they were at an information disadvantage relative to the information available on the floor. Consequently, the CME requested that Reuters develop the capability to display the best five bids and the best five offers (the market depth) on the GLOBEX screen.

163. Thus, it is my opinion that adding market depth, a well-known, common, and familiar element of electronic trading systems, to GL WIN v. 4.31 and 4.50 with Trading Pad, is obvious. The "market depth claims" simply arrange an old and familiar element, market depth, to perform no more than what one of ordinary skill would expect from doing so. The use of market depth in this form of Trading Pad is a predictable use of a well known element of prior art electronic trading systems. Further, there is a motivation to one of ordinary skill in the art to combine market depth to Trading Pad for the reasons stated above, and GL in fact did so on February 26, 1999. Moreover, it is my understanding that GL Win 4.31 with Trading Pad already contained code related to processing market depth in Trading Pad; thus, such a display appears to have been contemplated by GL Trade even before the release of the GL Win 4.51 with Trade Pad, including its market depth.

164. Further, the addition of market depth to GL WIN v. 4.31 and 4.50 with Trading Pad would have led to (and in fact did lead to when it was added by GL) predictable and anticipated results. One of ordinary skill in the art could have

implemented a predictable variation to include market depth in GL WIN v. 4.31 and 4.50 with Trading Pad. For example, the Application Program Interface (API) Reference Manual For LIFFE Connect Release 2.7 September 1998 provided this specification for the “LiffeDepthField” data structure:

LiffeDepthField

Type	Field	Contains
LiffeDepthField *	pcNext	Pointer to the next element in the linked list.
Int	nMarketPrice	Individual price existing in the market (in ticks).
Int	nAggregateVolume	Aggregate volume in the market at that price.

See DX 163, Appendix B, Section 4.2 on pg. B-3 (eS59937). To a programmer with ordinary skill in the art this specification indicates that the LIFFE Market Depth consists of a linked list of items, each of which has a “nMarketPrice” and an “nAggregate Volume” field. The API call returned two of these linked lists: one for Bids and one for Asks. To display this depth information on the Trading Pad v4.31 and 4.50 screen was a simple matter of locating the “nMarketPrice” within the static vertical price axis, and displaying the “nAggregateVolume” in the BidQty or the AskQty column adjacent to that price.

165. Similarly, once the initial market depth is displayed on the Trading Pad screen, the LIFFE Connect API sends additional messages whenever there is a change in the central order book. These book change messages were documented as follows:

Order Book Update

Description

This Response Handler Function is invoked when there is a change to prices and/or volumes in the central order book. The Client Application receives these calls for the markets to which it has subscribed only. The calls can be used to track the market together with an initial Market Depth query (See the ['Get Market Depth'](#) Response Handler Function on page 15).

void **OnMarketOrder** (const LiffeAutoMarketReference *pachMarketRef, int nMarketPrice, int nResidualVolume, int nVolumeChange, LiffeBuySell eBuySell, LiffeRFQXFlag eRFQXFlag, time_t nTimeStamp)

where:

pachMarketRef	Pointer to an Automated Market Reference variable
nMarketPrice	Price at which order book changes have occurred.
nResidualVolume	Aggregate remaining volume for market at the price in question.
nVolumeChange	Change in volume.
eBuySell	LIFFE_BUY or LIFFE_SELL.
eRFQXFlag	Variable indicating whether the order in question is a new RFQX order: LIFFE_RFQX_FALSE - not an RFQX. LIFFE_RFQX_TRUE - it is an RFQX. LIFFE_RFQX_INTENDED - it is an RFQX and you are the intended counterparty.
nTimeStamp	Time at which the response was sent from the Trading Host.

DX 163, Appendix A, Section 3.5 at A-16 (eS59923).

166. The most relevant fields in this data structure, for the purpose of updating a market depth display, are the “nMarketPrice” which indicates the position of the static price axis where the update is to occur, the “nResidualVolume” which indicates the order quantity to be displayed adjacent to the price, the “eBuySell” which indicates whether the order is a Buy (bid) or a Sell (ask) and therefore which side of the static price axis the quantity should be displayed. Thus, the approach of adding market depth to Trading Pad of GL Win v4.31 and 4.50 static price display would have been obvious to a person with ordinary skill in the art and would not have been beyond his skill.

167. The standard set by the Supreme Court (“[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results”) applies to the addition of market depth to the GL WIN 4.31. Market depth was a familiar element to persons of ordinary skill in the art. The method of adding this element to an existing static price axis as existed in GL Win 4.31 and 4.50 with Trading Pad utilizing the specifications of LIFFE Connect, and using examples from

the prior art (including within other windows of GL WIN) was well known, and the result was clearly predictable.

B. THE ASSERTED CLAIMS RELATING TO COLORS ARE OBVIOUS BASED ON GL WIN V. 4.31, 4.50, AND 4.51 WITH TRADING PAD

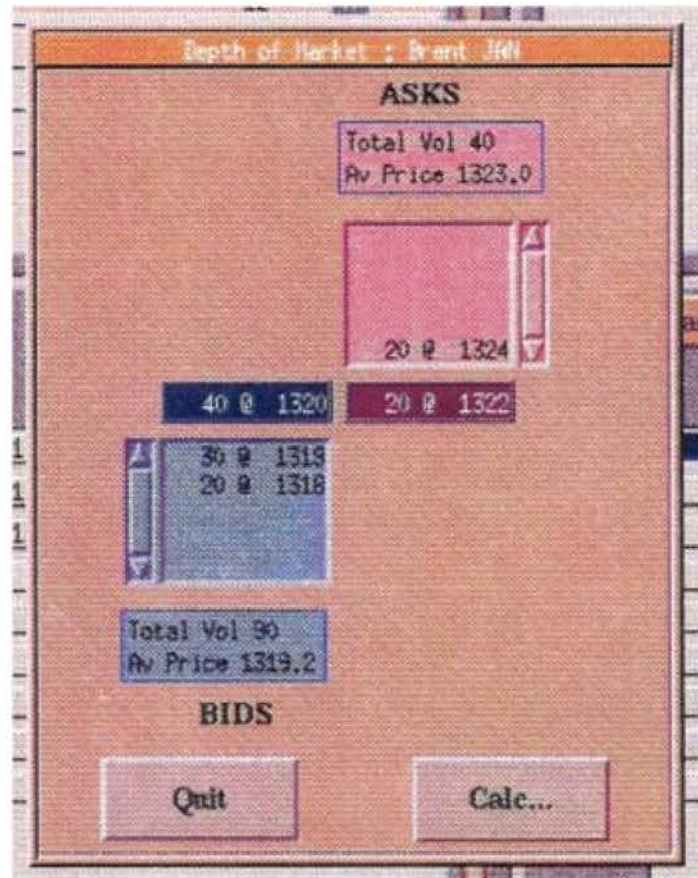
168. In my opinion, asserted claims 23, 33, and 43 of the '132 patent and asserted claims 24 and 25 of the '304 patent (“the color claims”) are obvious. The difference between these claims and the GL WIN v. 4.31, 4.50 and 4.51 with Trading Pad is that the claims state that the bid and ask display regions and the bid and ask indicators are displayed in different colors (‘304 patent), and that the that the bids and asks are displayed in different colors (‘132 patent). In my opinion, displaying the bids and asks and the bid and ask regions in different colors would have been obvious to one of ordinary skill in the art.

169. The ability to set user preferences on colors was a feature of the Microsoft Windows operating system in the versions Microsoft Windows 95, Microsoft Windows NT and prior versions. These systems allowed the user to select different elements of the screen display (e.g. title bars, window background, title font) and assign a user-selected color to these elements.

170. The use of colors to differentiate regions of a screen display had been practiced for many years in trading interface design as discussed above. The Gutterman ‘031 patent, which issued in 1994, states that “It is advantageous to show buy orders in blue and sell orders in red, and to outline the incoming orders pane in a contrasting color such as green.” Col. 11, lines 41-41. Similarly, the Friesen patent application, US 2003/0097325 A1 explains the benefits of displaying the bids and offers in different

colors: “The offers 304 and the bids 300 are displayed in different colors, shapes, textures or sizes, or other distinguishing vital characteristics, to allow the trader to quickly ascertain the current state of the market for this item.”

171. Other trading interfaces also implemented the use of colors to display different market information. In the Aurora system discussed above, the bids were displayed in blue and the asks were displayed in red. In addition, the picture below is from an April 1994 brochure describing a new trading system for the International Petroleum Exchange (IPE):



“The International Petroleum Exchange Energy Trading System,” April 1994.

172. Thus, it is my opinion that adding colors, a well-known, common, and familiar element of electronic trading systems, to Trading Pad, is obvious. The “color

claims” simply arranges an old and familiar element, color, to perform no more than what one of ordinary skill would expect from doing so. The use of different colors to display the best bid and asks indicators, or the market depth, or the BidQty and AskQty regions in Trading Pad would have been a predictable use of a well known element of prior art electronic trading systems. In fact, the Trading Pad does show the best bid price and best ask price in different colors. Further, there is a motivation to one of ordinary skill in the art to add colors to Trading Pad for the reasons stated above, and to differentiate bids from offers and thereby to reduce the risk of errors.

173. I reiterate the opinion of the Supreme Court (“[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”). Accordingly, it is my opinion that displaying the bids and asks and the bid and ask regions in different colors in Trading Pad in GL Win V 4.51 was obvious to a person of ordinary skill.

174. For the same reasons, it would have been obvious to display bids and asks and bid and ask regions in different colors in GL WIN v. 4.31 and 4.50 with Trading Pad.

D. THE ASSERTED CLAIMS RELATING TO LAST TRADED QUANTITY ARE OBVIOUS BASED ON GL WIN V. 4.31, 4.50, AND 4.51 WITH TRADING PAD.

175. In my opinion, asserted claims 29, 39, and 49 of '132 (“the last traded quantity claims”) are obvious. The difference between these claims and the GL WIN v. 4.31, 4.50 and 4.51 with Trading Pad is that these claims add a limitation whereby a last traded quantity is dynamically displayed in alignment with the price corresponding thereto. In my opinion, adding such a dynamic display of a last traded quantity would have been obvious to one of ordinary skill in the art.

176. The ability to dynamically display the last traded quantity was a known feature in prior art trading systems. For example, the Patsystems PTS application (as depicted in Kharouf, “A Trading Room With A View”), dynamically displayed last traded quantities on the “Hot Quotes” window, which could be displayed in association with the Depth of Market (DOM) screen. Likewise, the IRIS screen depicted in the February 1999 LIFFE ISV Directory shows a display of a last traded quantity. In addition, the price and quantity of the last trade was displayed in the Ticker window of the OM Click application. “The Technology of Trade: Presenting OM CLICK Exchange System” (OM Systems Int'l., 1995).

177. It would have been an obvious variation to provide the information about the last traded quantity in a column of Trading Pad, or elsewhere on the screen in association with the prices. Doing so would have been a predictable use of an established element of prior art electronic trading systems.

E. THE ASSERTED CLAIMS ARE OBVIOUS TO ONE OF ORDINARY SKILL IN THE ART BASED ON THE TOKYO STOCK EXCHANGE PRIOR ART.

178. In my opinion, each of the asserted claims of the '132 and '304 patents are obvious based on the TSE98 system. As explained above and in the attached claim chart,

TSE98 implemented the main features of the '132 and '304 patents, including a static price axis, a dynamic bid and an ask display, and an order entry region. The main difference between the TSE98 and the asserted claims is that TSE98 did not incorporate complete single action order entry. In my opinion, it would have been obvious to one of ordinary skill in the art to add single action order entry to the TSE98 system. It also is my opinion that it would have been obvious to include color differentiation of bids and asks, single action order cancellation, and displaying working orders, entered orders and last traded quantity in association with the price display.

i. It Would Have Been Obvious To One Of Ordinary Skill In The Art To Add Single Action Order Entry To TSE98

179. For the reasons set forth in the claim chart attached as Exhibit 3 and as stated in this Report, in my opinion, claims 1, 2, 3, 8, 9, 10, 14, 15, 16, 20, 22, 24, 27, 28, 30, 32, 34, 37, 38, 40, 42, 44, 47, 48, 50, 51, 52, 53, 54 of the '132 Patent and claims 1, 2, 3, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36 and 37 of the '304 Patent are obvious in light of TSE98 and the prior art with single action order entry.

180. Single action order entry was a common function of computer interfaces for trading systems as of March 1, 1999. In general terms, single action order entry is implemented by combining three functions of the user interface: first, a method to pre-define certain order parameters so they do not need to be entered at the time the order is sent, second, a method to retrieve certain dynamic order parameters based on the location the user clicks or selects on the screen, and third, a method to send the order to the exchange without further confirmation from the end user. Of these three building blocks, TSE98 incorporated all of the first element, all of the second element to the extent that it

was appropriate for their user base, and did not incorporate the third element. However each of these building blocks individually, and in combination, were well known in the prior art and well known to individuals with ordinary skill in the art as of March 1, 1999.

181. TSE98 provided a mechanism to pre-define certain trade order parameters so that they could be set in a trade order at the moment the user elected to place a trade. In particular, the “self/consigned” parameter could be set by the TSE98 user as a default for all subsequent orders. The mechanism for performing this parameter setting function is described on TSE000721, page 6-10. The illustration from that reference is shown below for clarity:

6-5-2 Setting procedure

- ① Make selections in the following order, starting from the main menu bar: Settings → 3 Order entry setting.
- ② Enter the number to be set as the limit on the number of entries in the number limit entry space for each market in the order entry numerical limit setting space of the order entry setting instruction entry window.
- ③ By carrying out the send procedure, the limit on the number of entries is set.

Order entry setting

Order input limit quantity setup/order input warning value step setup
 (Nearest value ± limit value step times X %)

Market Category	Limit Value	Range (%)	Market Category	Limit Value	Range (%)
Bond futures	100		Bond futures OP	100	
Index futures	100		Index OP	100	
Stock OP					

Specify the limit on the number of orders to be entered for each market at the time of order entry.

Control item automatic setup

None
 Self
 Consgn

Send Cancel

KB OK

182. The previously described “Self” or “Consigned” trade order default can be seen in the lower left corner of this dialogue box. The upper region of the dialogue box is used to set another default parameter, which is the “Order input limit” parameter and is defined for different types of instruments (market categories such as Bond futures, Index futures, etc.). The “order input limit” parameter was used by TSE98 to check that the user did not accidentally enter an order quantity that was too large. If the order quantity exceeded the “order input limit” for that market segment then a warning was given to the user prior to submission of the order.

183. As stated earlier in this Report, the use of order size defaults was well known in the prior art, and the motivation for using order size defaults was also well known. For trading screens utilized by proprietary traders, where the decision on order size rests with the screen user (as opposed to a customer on the phone as is the case with a broker), it can significantly speed the order entry process to have a pre-set order size parameter. This is the motivation for including such a feature. Conversely, if the typical workflow involves receiving the order size from a customer (as is the case with a broker), it can actually slow down or increase the risk of errors in the order submission process if the order is pre-populated with a default order size which must then be changed by the broker.

184. This is further confirmed in the deposition of Mr. Nicholas Garrow, then of Patsystems. Mr. Garrow testified that Patsystems implemented single-click trading in 1998 because a significant amount customers were demanding it. Garrow Dep., 5/25/05, at 35. In particular, single-click trading appealed to a particular type of customer who

began leaving the trading floor and trading electronically after LIFFE went electronic in 1998.

185. Specifically for the TSE system, Mr. Kida stated that typically the users of the TSE system did not trade using default quantities. Kida Dep., 5/17/07, at 129-30. It would have been slower for these users if the order was pre-populated with a default order size because they would have to change it before they placed an order. However, for traders who trade with default quantities, it would have been obvious to pre-populate the quantity parameter and trade with one or two clicks of a mouse button as was done in numerous prior art trading systems as previously discussed. The motivation to do so is speed and giving the trader the ability to trade as quickly as possible. This is further proven by the fact that Midas Kapiti had an electronic trading system directed to traders who typically traded with default quantities. Kida Dep., 5/17/07, at 129-30. The Midas Kapiti Fast Order Entry Window had the ability to set default quantities and allow the users to trade with one or two clicks of a mouse without a confirmation window. Market Trader v. 5.2a Release Notes, DX 617, at 10, 14-15; DX 618; Kida Dep. at 36-39. I reiterate the opinion of the Supreme Court ("if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.").

186. Many prior art electronic trading systems allowed the user to set the default size and trade with a single action. For example, the GLOBEX system launched in 1992 included a facility whereby the user could decide whether or not he or she wanted

to have an order size default, and could make this decision for each instrument traded on the system. The illustration below depicts how this worked in GLOBEX in 1992:

12.18. Set Instrument Defaults

Description of Function

The Set Instrument Defaults Dialog Box allows the trader to change defaults which pertain to individual instruments. These include order size, price check percent and quantity increment.

The dialog box is titled "SET TRADER DEFAULTS". It features two listboxes: "System Pages" on the left and "Contents" on the right, each with up and down arrow controls. To the right of these is a "Service List" dropdown menu. Below the listboxes are five buttons: "Reset All", "Reset", "Save/Cont", "QUIT", and "OK". To the right of the buttons are three text input fields labeled "Increment Size:", "Order Size:", and "Price Check %:".

Figure 25 - Set Instrument Defaults Dialog Box

Set Default Trade and Increment Sizes

- * When the Set Instrument Default Dialog Box is invoked, the pages are displayed in a System Pages listbox.
- * When the trader selects a page the instruments from that page are displayed in the Instrument List Box.
- * Clicking on an instrument (or selecting with the arrow keys and using the space bar) highlights it and displays the Current Order Size, Increment Size and Price Check % in the associated edit text boxes.
- * The **Order Size** is used as the default quantity for all trading function dialog boxes To change the **Order Size** or **Increment Size** for the instrument, the trader enters the new values in the appropriate edit text boxes.

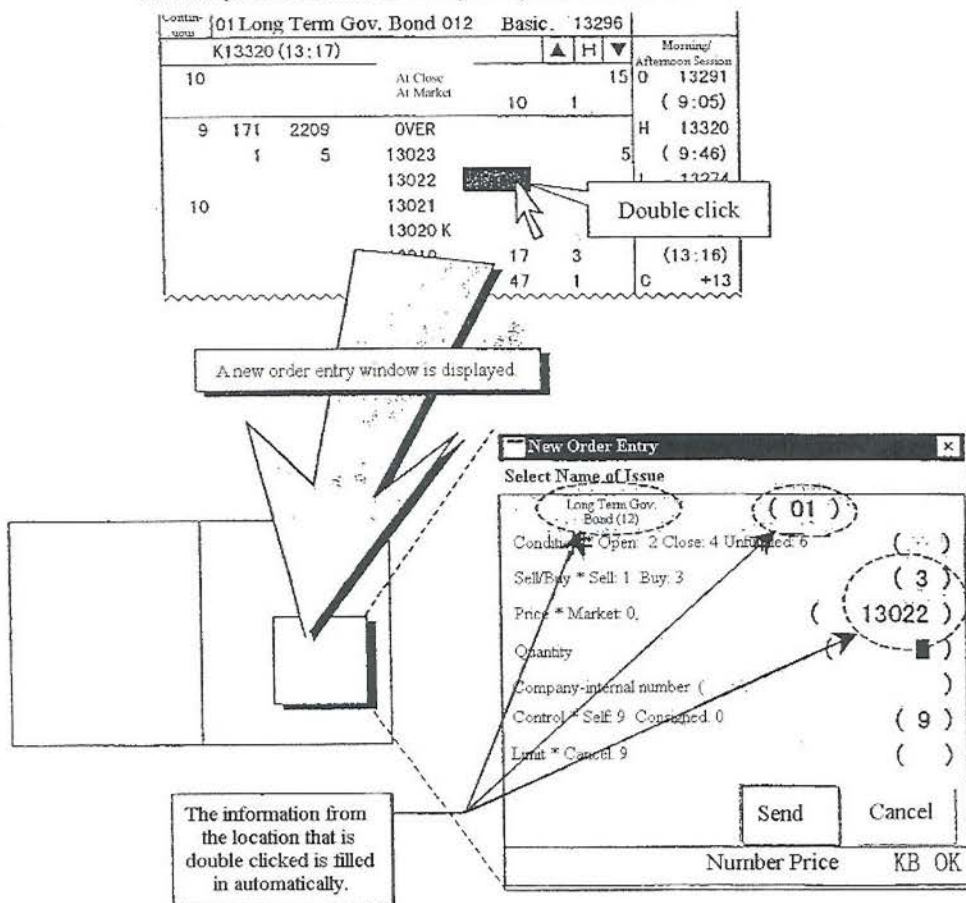
System Functional Specification, Globex Keystation, at 12.18.

187. It would have been obvious to a person with ordinary skill in the art that the dialog box utilized in TSE98 for setting various trade order parameters (self/consigned and order input limit quantity) could have been easily used to setup a Order Size default for each market segment. In fact the identical structure of that dialog box, in which a quantity parameter is input for each market segment, could have been used for the order size default rather than the input limit quantity default.

188. Had this been done in TSE98 then the expected result would have been that all of the requisite parameters for the trade order could have been established through a combination of pre-defined defaults plus the specific order entry region on the screen where the user clicked his or her mouse.

189. This one small and obvious addition to TSE98 would have provided a single-action order entry capability. The bid and ask order entry regions of TSE98 are defined on TSE000783 (page 9-5). The description on that page is as follows: “Use the mouse to double click the special area in the board/quotation screen. Depending on the location that has been double-clicked, the ‘issue name,’ ‘sell/buy,’ ‘order price,’ and ‘execution conditions’ will be filled in automatically.” The illustration on that page is shown below:

<An Example of Automatic Fill-in Depending on the Double Click Position>



190. It is clear from this TSE98 reference that there was a bid order entry region to the right of the vertical price axis, and it consisted of a vertical series of individual cells which were capable of receiving commands. Similarly there was an ask order entry region to the left of the vertical price axis, configured in the same manner. It is also clear from the illustration, and Mr. Kida's deposition, that the cursor was pre-positioned in the pop-up order entry window in the Quantity field, so the user could enter this last remaining piece of information prior to clicking the SEND button. Kida Dep., 5/17/07, at 125-26. It is also clear that had TSE98 implemented a size default function (as previously described) then there would have been nothing to enter into this box and the order could have been sent with a single or double key or click.

191. The addition of single action to TSE98 is nothing more than a combination of familiar elements according to known methods and would yield predictable results. The addition of single action would have performed the same function as it had in the numerous other prior art systems and would have yielded what one of ordinary skill in the art would have expected from such an arrangement. It would not have been beyond his skill. To reiterate the opinion of the Supreme Court, “the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”

ii. It Would Have Been Obvious To One Of Ordinary Skill In The Art To Add Single Action Cancellation To TSE98

192. For the reasons set forth in the claim chart attached as Exhibit 3 and as stated in this Report, in my opinion, clam 7 of the '132 patent is obvious in light of TSE98 and the prior art with single action cancellation as discussed above.

193. As described earlier, the ability to cancel orders is a necessary component of an electronic trading interface for the reasons stated earlier and was a common feature on other electronic trading systems: GLOBEX, LIFFE APT ("At any time, a trader can immediately cancel individual bids or offers by using the "OUT" command.") (DX148); Minex 1992 Manual at pg. 12 ("press the cancel key to withdraw all displayed orders."); SWX ("To delete the order in the order book, Bianchi selects it . . . and opens the pop up menu. After clicking on "delete" and confirming the intent to delete, the delete command for the selected order is transmitted to the exchange system.") (Man. p. 6-17); and GLOBEX2 (F8 and enter) (Globex2 Man. at 5.5). In addition, many ISVs included a single action cancellation of orders feature with their electronic trading systems before the critical date, including Datastream ICV (LIFFE 1998 Directory) ("one click order

removal"), Patsystems PTS Client (If the user wants to cancel an order, hit the cancel key and a prompt will appear to confirm), Communicating Ltd. (2/1999 LIFFE Directory) ("Pull all button"), RTS (2/1999 LIFFE Directory) ("Panic button"); GL WIN (F8 <enter>).

194. Adding single action cancellation to TSE98 would have been nothing more than a combination of common, well-known, familiar elements and would have yielded predictable results that was not beyond the skill of one of ordinary skill in the art. Single action cancellation was an old element that would have performed the same function on TSE98 as it had on prior art electronic trading systems. The motivation to combine single action cancellation with TSE98 is to provide the trader with the ability to quickly remove orders if the market turns adversely.

iii. It Would Have Been Obvious To One Of Ordinary Skill In The Art To Add A Working Order Indicator Or An Entered Order Indicator In The TSE98 System.

195. In my opinion, claims 25, 35, 45 of the '132 patent ("the working order claims") are obvious, and that claims 26, 36, 46 of the '132 patent and claims 16 and 17 of the '304 patent ("the entered order claims") are obvious.

196. "Working Orders" are a trader's own trade orders which have been submitted to the electronic market but have not yet completely traded. A trader needs to be constantly aware of which orders he has in the market so that he can modify or cancel these orders if there is an adverse movement in market prices. Virtually every electronic trading system since the early 1990's provided some facility for a trader to view a dynamically updating information display of his own working orders, in association with the dynamic display of market prices.

197. For example, in 1992 GLOBEX provided a “Open Orders” window, illustrated below from a 1997 GLOBEX manual:

Displaying Lists of Open Orders

Figure 8-1 shows the Listing of your Open Orders. To display the list:

- Press the **Open Orders** hard key.
- OR
- Choose **Open Orders** in the Display menu.

The list shows orders for only one Service at a time. It is arranged by order number, and shows order number, if it is a Bid or an Offer, the instrument name, the price and quantity, the clearing information qualifier, order type, and account number. Use the **Page Fwd** and **Page Back** command buttons to view additional orders.

To display orders for another Service, choose the Service.

LISTING OF OPEN ORDERS							
Service List							
GLOBEX Europe							
Order #	B/S	Instrument	Price	Qty	Qual	Type	Account
MG2-8	BID	FONHG7P1270	434	10		LMT	1234889
MG2-8	ASK	FONHG7P1270	436	25		LMT	1234889
MG2-10	BID	FNNHH7	12278	4		LMT	1132456789
MG2-11	BID	FNNHM7	12320	10		LMT	1132456789
MG2-11	ASK	FNNHM7	12330	5		LMT	1132456789
MG2-12	ASK	FPIBH7	9564	5		LMT	1132456788
MG2-13	BID	FPIBH8	9548	5		LMT	1132456789
MG2-13	ASK	FPIBH8	9549	5		LMT	1132456789
MG2-15	BID	FPIBU7	9568	5		LMT	1132456789
MG2-15	ASK	FPIBU7	9569	4		LMT	1132456789

Number of Open Orders: 35

Figure 8-1: Listing of Open Orders

198. This window showed the Order Number, Buy/Sell indicator, Instrument, Price, Order Quantity, Order Type, and Order Account. The window could be accessed by pressing a single key (the “open orders” key). The window was part of the same GLOBEX application which displayed the best bid, best ask and market depth, and the information in this window was associated with the market information in the other GLOBEX windows.

199. In 1995, OM Click illustrated a different method for providing the user with working order information in association with market depth. In the OM Click

method the trader's own order was shown precisely in its location in the market depth display:

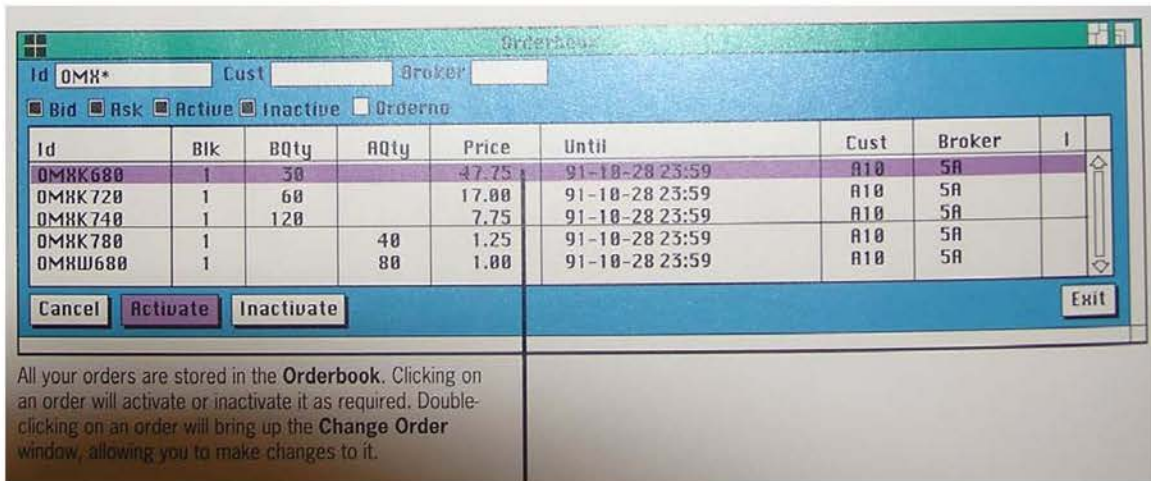
The **Market Orders** window gives you the depth in the market and shows the ranking of your order in the orderbook. Another way of seeing the depth in the market is by using the **Price Depth** window which shows the five current best bids and offers. A calculation function lets you calculate the average price of an order.

Bid			Ask		
Price	Qty	Company	Price	Qty	Company
7.75	70		8.00	60	
7.75	50		8.00	30	
7.50	50		8.25	20	
7.25	10		8.25	100	
7.25	40		8.50	20	
7.00	20		8.50	10	
7.00	100				
6.75	30				

Id	Qty	Price
OMXK 780	50	8.50
OMXK 680	30	47.75
OMXK 680	40	48.00
OMXK 680	30	47.50

“The Technology of Trade: Presenting OM CLICK Exchange System” (OM Systems Int’l., 1995).

200. OM Click also provided a view of working orders similar to the GLOBEX view, as shown below:



“The Technology of Trade: Presenting OM CLICK Exchange System” (OM Systems Int’l, 1995).

201. In a November 1998 article printed in Futures Magazine (“A Trading Room With a View”, Kharouf & Cavaletti), and in a October 1998 article also in Futures Magazine (“Exchanges Put On New Game Faces”), various examples of software for electronic trading were reviewed. The systems depicted in these brochures – including PAT Systems PTS Application, Trading Technologies X_Trader, MATIF’s NSC-VF system and GLOBEX2 – included a market depth display, and a working orders display.

202. Display of working orders in association with a vertical market depth display was also published in the Gutterman (‘031) patent discussed above. In the illustration above, the column of numbers ranging from 26 up to 00 is a vertical price axis (identified as 136 in the drawing). The numbers on the left (60, 40, 25) are market depth bid quantities (identified as 133 in the drawing). The numbers on the right (40, 70, 100) are market depth ask quantities (also identified as 133 in the drawing). The last trade is at 29. The brokers own orders are shown in association with this market depth display as

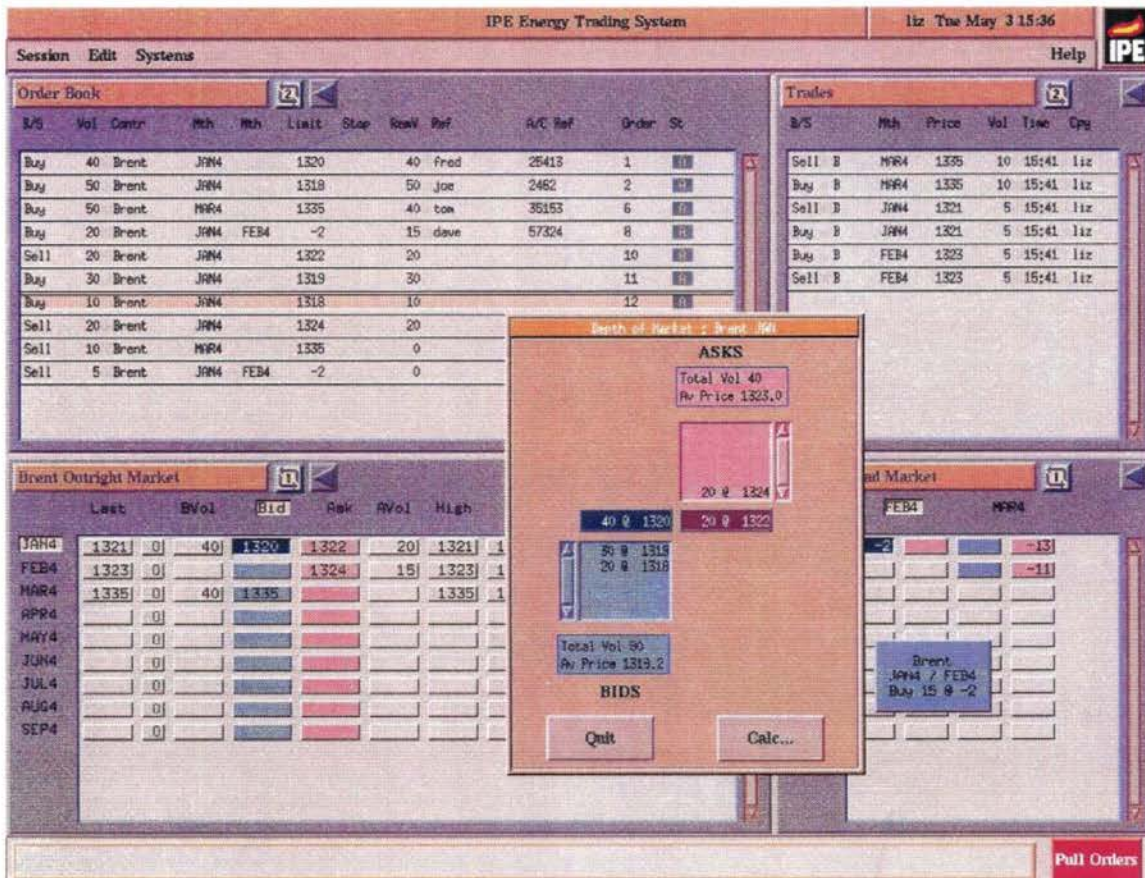
the squares (20, 5, 15, 20) for bids and the circles (30, 10, 25, 5, 30) for asks (identified as 139-x in the drawing).

203. Clearly, a display of a trader's working orders in association with market depth and a price display was old art as of March 1, 1999.

204. In my opinion, the entered order claims are obvious. The difference between these claims and the GL Win 4.31, 4.50, and 4.51 with Trading Pad is that the claims add a limitation regarding dynamically displaying entered orders in alignment with the prices corresponding thereto, showing the quantity for which a trader's orders have been filled at the corresponding prices.

205. As used in the TT patents, the term "entered orders" refers to a trader's orders which have been partially or completely executed (filled) in the market. Clearly this information is vitally important to any trader because the filled orders represent positions that trader has and that are subject to the risk of adverse price movements. Consequently it is a feature of most trading systems from the early 1990's onward to display order fill information ("entered orders") in association with the other price information on the screen.

206. The picture below is of an International Petroleum Exchange (IPE) trading screen from 1994. It clearly depicts depth of market, working orders, and entered orders. The working orders are in the window titled "order book" and the entered orders are in the window titled "trades":



“The International Petroleum Exchange Energy Trading System,” April 1994.

207. The information depicted for “entered orders” is the Buy/Sell indicator, the contract, the price, the volume, the time of the trade and the counterparty. This information is displayed in association with the depth of market display.

208. The screen grab below is from the MATIF exchange in 1998, and illustrates the window (in red/green/yellow bars) with working order and entered order information. It states that the window includes the order quantity, the remaining quantity, the executed quantity, and the average price for the executed quantity, i.e. the entered order.

Data such as prices, trades and volume can be linked for automatic updates in Microsoft Excel.

A price snapshot of the September notional contract.

The five best bids and offers in the market.

One of several stock index windows updated in real time.

The order book with different color coding for the status of trades. Red indicates a rejected trade that does not fit the security parameters set by the trader. (A separate pop-up window will give the reason.) Yellow indicates an order that is partially filled. (Qty is the order quantity, 11 under Qrem is the quantity remaining and 67 under Qexe is the quantity executed.) Green shows a completed order. White is the next order for the market.

A more detailed look at the red window and flag of the Paris index above.

Jim Kharouf, "Exchanges Put on New Game Faces," Futures, Oct. 1998, at 86.

209. This information is displayed in association with the display of market depth (the five best beds and offers in the market).

210. Similar functionality was provided by OM's ORC trading application, illustrated below:

Clicking: OM's Orc trading application

OM's front-end application Orc is designed to provide simple trading and risk management tools.

Strike prices on the Dax options.

This call options trading window lists the number of contracts in the market and price on both the bid and ask side as well as implied volatility and the delta and gamma. Green highlighted prices indicate the latest price is above the last price. Red indicates a lower price.

This window monitors trades executed for the day.

Real time portfolio with risk management tools. This shows the delta and gamma values to illustrate what will happen to the portfolio if the underlying market moves. It also can calculate multiple currency portfolio changes in real time.

This represents option puts and reflects the same functions as the call window to the left.

This is the book. Every trade executed, sold or bought is logged automatically.

The ticker window displays all completed trades on the Dax.

Jim Kharouf, "Exchanges Put on New Game Faces," Futures, Oct. 1998, at 88.

211. The window which monitors trades executed for the day provides the "entered orders" information.

212. Additionally, I have reviewed the GL WIN with Trading Pad version 4.31 software and related documentation (DX 384). This software dynamically displays order fill information, including size and price, in association with a static vertical display of market depth (the Trading Pad component). The documentation (dated January 1999) indicates that the GL Nego window can be configured to display multiple fields, including "Quantity executed" and "Average price". DX 384, p. 13 (G0107493).

213. The style of entered order information illustrated in these examples was useful in the workflow of a broker, managing customer orders. In such a workflow the broker needs to be able to view the detailed trade information for each order which he has managed, as opposed to a view which accumulates all trades that have occurred at a particular price. The latter style of display, which was implemented in the TT component, is particularly well suited to a proprietary trader.

214. Thus it is clear that, as of March 1, 1999, the display of entered orders in association with a display of market depth was well known and old art.

215. For the reasons set forth in the claim chart attached as Exhibit 3 and as stated in this Report, in my opinion, the entered order claims and the working order claims are obvious in light of TSE98.

iv. It Would Have Been Obvious To One Of Ordinary Skill In The Art To Display The Bids and Asks In Different Colors In The TSE98 System, and the Last Traded Quantity.

216. It is also my opinion that color claims and the last traded quantity claims are obvious in light of TSE98. For the same reasons that the inclusion of these elements to the GL WIN with Trading Pad would have been obvious to one of ordinary skill in the art, it would have been obvious to one of ordinary skill in the art to include those features on TSE98.

E. THE ASSERTED CLAIMS OF THE '304 AND '132 PATENTS ARE OBVIOUS BASED ON THE MIDAS KAPITI FAST ORDER ENTRY WINDOW

217. It is also my opinion that each of the asserted claims of the '132 and '304 patents is obvious in light of the MIDAS KAPITI Market Trader with Fast Order Entry window and the Order Book window as shown in DX 618 (the March 1998 version), and the system itself described in the deposition of Mr. Hiroyuki Kida, day 1.

218. The main difference between the MIDAS KAPITI and these claims is that these claims are directed to the dynamic display of the best bid and ask quantities or dynamic display of the market depth. But for the same reasons that it would have been obvious to include market depth on GL WIN 4.31 with Trading Pad, it would have been obvious to include a dynamic display of the best bid/ask quantities or market depth on Midas Kapiti.

219. Further, the reason that Midas Kapiti did not show best bid or ask quantities or market depth in 1998 was because the TSE did not provide this information to ISVs at that time. Kida Dep. 53-54. Once the TSE supplied this information to ISVs,

then Midas Kapiti included the dynamic display of the best bid and ask quantities and the market depth on the FOE window of Market Trader. Kida Dep. at 55.

220. As for the remainder of the asserted claims, it would have been obvious to a person of ordinary skill in the art to add the missing elements to Midas Kapiti for the reasons previously stated with respect to GL WIN with Trading Pad or TSE98.⁵

221. It is also my opinion that the March 18, 1999 Market Trader v. 5.2a Release Notes (DX 617), and the system itself described in the deposition of Mr. Hiroyuki Kida, day 1, renders obvious the asserted claims that it does not anticipate for the same reasons stated above with respect to GL Win 4.31 with Trade Pad.⁶

F. SECONDARY CONSIDERATIONS

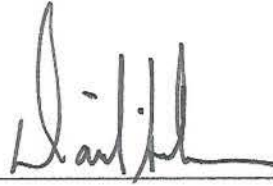
222. I understand that TT may raise secondary considerations as evidence of non-obviousness. I reserve the right to respond to these opinions, if necessary, and to the extent that it has bearing on my opinion.

223. I understand that one secondary consideration supporting a conclusion of obviousness is near simultaneous development of the invention. Here, GL developed its Trading Pad in 1998 and continued to enhance it in 1999. Midas Kapiti released its Fast Order Entry system in 1998 and included market depth in March 1999. The fact that others in the industry had a near simultaneous development of the alleged invention set forth in the patents supports my opinion that the asserted claims are obvious.

⁵ The working and entered orders are described in section 3.3.5, “the Order Book Window.”

⁶ In this respect, I note that the FOE window of Market Trader v. 5.2a displays the best bid and ask quantities in different colors, and therefore anticipates the color claims. With respect the working order claims and entered order claims, the FOE renders them obvious for the reasons stated for TSE98.

Dated: 6/6/2007



David L. Silverman

EXHIBIT 1

Curriculum Vitae

David L Silverman

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+1516-849-3871 (cell)
+1631-584-3938 (fax & phone)

Education

Amherst College, Amherst, MA
Bachelor of Arts, Magna cum Laude, Major Mathematics, 1971

Academic Awards and Honors

- Westinghouse Science Talent Search National Finalist (1966)
- National Merit Scholar (1966)

Significant Professional Achievements: 1985 - 2005

- Designed, developed, and launched the first electronic matching system for the spot foreign exchange market (Dealing 2000-2).
- In conjunction with the CME and CBOT, designed, developed and launched the first fully electronic global market for financial futures (GLOBEX ®).
- Designed, developed and launched Reuters consumer website, <http://reuters.com>.
- Designed a comprehensive content architecture with associated symbology and metadata for the financial markets.
- Designed and developed core news and data components of the world's highest performance quotes distribution network (IDN).
- Received US patents for several fundamental technologies in the field of computerized trading and electronic matching.

Employment History

Oct 2005 – Nov 2005

Major Private Equity Firm

Expert Consultant, Electronic Trading

Provided advice to a major private equity firm on trends and future scenarios for electronic trading in the wholesale financial markets. Developed an analytical framework to assess the likelihood and extent of electronic trading across a broad range of financial products.

1983 – Present

Reuters Limited

Special Advisor to CTO and Group Management Committee

(2004 – present)

Provide advice on matters related to protection and licensing of intellectual property, including patents and copyrights. Assist in patent litigation matters. Provide strategic input and review of special projects as requested by members of the executive committee and their designees.

Executive Vice President, Head of Content Architecture

(2002 – 2003)

Developed a comprehensive architecture for the financial services domain, including structure, symbology, and metadata. Worked extensively with customers to validate the architecture against practical applications. Managed the Reuters relationship with Factiva, a Dow-Jones/ Reuters joint venture.

Curriculum Vitae

Executive Vice President, Reuters Personal Finance (2000 – 2002)

Developed a strategy to place Reuters into the consumer marketplace, secured internal funding, built a team of over 100 internal and external staff, and launched *reuters.com* in less than six months from board approval. Provided a resilient infrastructure which now supports one of the largest news and financial information websites on the Internet.

Executive Vice President, Client Solutions Group (1998 – 1999)

Assigned to a startup division within Reuters, to seek growth opportunities outside the traditional financial marketplaces. Secured a significant consulting contract with an e-health provider (Personal Path Systems). Managed development of innovative database solutions for HIPAA-compliant knowledge mining of health insurance claims data.

Executive Vice President, Transaction Products Management (1994 – 1997)

Responsible for all product management and business strategy development in the transaction products division, including GLOBEX®, Dealing 2000-2 Spot, Dealing 2000-3 Forwards, Corporate Dealing, Emerging Markets, and Fixed Income transaction strategy. Directly managed staff of 8 and indirectly managed development group of approximately 150 programmers. Extensive involvement in contract negotiations with brokers (e.g. Cantor Fitzgerald) and exchanges (e.g. CME, CBOT, MATIF).

Senior Vice President, Dealing 2000-2 Product Management (1990 – 1993)

Responsible for all aspects of Dealing 2000-2 and Dealing 2000-3 product management and development, including identification of business requirements, customer focus groups, release management, quality assurance, and customer feedback. Management of development resources (approx. 100 staff) and budget.

Senior Vice President, GLOBEX® Development (1988 – 1990)

Responsible for the delivery of the GLOBEX® system to the CME, CBOT and MATIF, as required by the contractual arrangements among the parties. Demonstration of system capacity to meet anticipated market peaks, agreement on enhancements and timetable for delivery of features. Involved in all aspects of contract negotiation, including technology and business terms.

Vice President, RDTs Development (1986 – 1987)

Appointed to the newly created Transaction Products division, to develop a technical strategy for order-driven matching systems across all financial markets. Developed the Reuter Dealer Trading System (RDTs) strategy and technology platform, with prototypes built for fixed income, foreign exchange, and financial futures.

Project Manager, Real Time Data Systems (1983 – 1985)

Managed a group of 15 programmers responsible for the design and development of Reuters next-generation financial quote retrieval system, a component of the IDN network. Designed and supervised the development of the News Processing System, the real-time news component of IDN. Extensive use of VAX, VMS, and Pascal.

1981 – 1982

Hudson Soft Inc.

Ported single player video games to a variety of hardware and software platforms for the Japanese home computer market. Managed small team of video game designers.

Curriculum Vitae

1979 – 1980

Independent Software Consultant

Worked on a next-generation operating system for the CHI 2130 minicomputer, including a multi-user, multithreaded kernel and a multiprocessing control program. Collaborated with hardware designers to define instruction set and processor logic.

1975 – 1978

Business Automation Inc.

Developed accounting applications in Fortran and COBOL. Developed enhancements to COBOL compiler to implement language extensions. Designed and developed first multi-user real-time database system for IBM 1130 minicomputer.

Patent Awards

A non-exhaustive list of awarded US Patents is shown below. In addition to these there are pending US applications, and a significant number of EPO patents which have resulted from the work described in this curriculum vitae.

1. Distributed Matching System, Patent Number 5077665, Silverman et al., December 31 1991. Describes a matching system for financial instruments, involving a host system, a keystation, and a dynamically variable book of bids and offers. Referenced in 85 patents.
2. Anonymous Matching System, Patent Number 5136501, Silverman et al., August 4 1992. Describes a matching system which effects anonymous transactions in a credit sensitive market by ensuring that matches are only executed within pre-specified, and dynamic, counterparty credit limits. Referenced in 131 patents.
3. Negotiated Matching System, Patent Number 5924082, Silverman et al., July 13 1999. Describes a negotiated matching system that first matches counterparties who are acceptable to each other based on trading and ranking information, and then enables the two counterparties to negotiate and finalize the terms of a transaction. Referenced in 45 patents.
4. Distributed Matching System for Displaying a Book of Credit Filtered Bids and Offers, Patent Number 5924083, Silverman et al., July 13 1999. Describes a matching system which provides real-time credit filtered market information consisting of unilaterally and/or bilaterally credit filtered orders and available quantities. Referenced in 14 patents.
5. Electronic Trading System Featuring Arbitrage and Third-party Credit Opportunities, Patent Number 6519574, Wilton et al., February 11 2003. Describes a trading system that effects credit arbitrage and/or name-switching by automatically detecting and executing transactions based on credit parameter data, name switch parameter data, and trading data.

Board Memberships

- Reuters Futures Services (1989 – 1996)
- Active Buddy, Inc. (2001 – 2003)
- Financial Information Services Division, SIIA, Executive Committee (2003)

Civic Involvement

- Member, Joint Coastal Commission, Village of Head of the Harbor, 1995 – present
 - Chairman, Planning Board, Village of Head of the Harbor, 1996 – present
-

- References Available Upon Request -

EXHIBIT 2

'132 Patent Claim Chart For GL WIN with TradePad

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
1	A method of placing a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, using a graphical user interface and a user input device, said method comprising:	The GL WIN with Trading Pad (GLWTP) versions 4.31 and 4.50 were graphical user interfaces for displaying information from an electronic commodity exchange, including the inside market consisting of the highest bid price and the lowest ask price. These GLWTP versions included a method for placing trade orders using a mouse as the user input device.	The GL WIN with Trading Pad (GLWTP) version 4.51 was a graphical user interface for displaying information from an electronic commodity exchange, including the inside market for a commodity consisting of the highest bid price and the lowest ask price. The Trading Pad included a method for placing trade orders using a mouse and keyboard as the user input device.	
	setting a preset parameter for the trade order	The GLWTP 4.31 and 4.50 allowed the user to preset a quantity parameter for trade orders.	The GLWTP 4.51 allowed the user to preset a quantity parameter for trade orders.	
	displaying market depth of the commodity through a dynamic display of a plurality of bids and a plurality of asks in the market for the commodity, including at least a portion of the bid and ask quantities of the commodity	The GLWTP 4.31 and 4.50 displayed a single market bid and a single market ask, together with the quantities for that bid and ask. This display was dynamic and changed as the best bid and ask price or quantity changed.	The GLWTP 4.51 displayed multiple bids and multiple asks (the market depth) including the quantities associated with those market bid and ask orders. This display was dynamic and changed as the market bid and ask prices and quantities changed.	The ability to enhance GLWTP 4.31 and 4.50 to display multiple bids and multiple asks could be done using techniques that were well known in the prior art. Adding additional bid and ask sizes that are aligned to the price axis of GLWTP 4.31 and 4.50 would have yielded the predictable result of displaying market depth, as is seen in GLWTP 4.51.

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
				<p>Other systems which displayed market depth included:</p> <ul style="list-style-type: none"> INTEX (1984) SPATS (1986) GLOBEX (1992) MINEX (1993) IPE (1995) OM Click (1995) MEFF (1996) TIFFE (1996) CUBS (1997) SWX (1996) TSE (1998) PATS (1998)
	<p>the dynamic display being aligned with a static display of prices wherein the static display of prices does not move in response to a change in the inside market.</p>	<p>In GLWTP 4.31 and 4.50 the market bid and ask quantities were arranged in two columns: BidQty and AskQty which were aligned with a third column containing a static display of prices. The display of the best market bid and ask quantities was dynamic because the quantities were updated on the screen when the orders changed in the market. The static price column did not change when the market bid and market ask quantities or prices updated.</p>	<p>In GLWTP 4.51 the market bid and ask quantities were arranged in two columns: BidQty and AskQty which were aligned with a third column containing a static display of prices. The display of market bid and ask quantities was dynamic because the quantities were updated on the screen when the orders changed in the market. The static price column did not change when the market bid and market ask quantities or prices updated.</p> <p>In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.</p>	
	<p>displaying an order entry region aligned with the static display of prices comprising a plurality of</p>	<p>The GLWTP 4.31 and 4.50 display included two columns headed "User" – the left hand column was used to</p>	<p>The GLWTP 4.51 display included two columns headed "User" – the left hand column was used to enter</p>	

TTX02036825

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
	<p>areas for receiving commands to send trade orders, each area corresponding to a price of the static display of prices; and</p>	<p>enter commands to send bid orders and the right hand column to enter commands to send ask orders. The cells in these columns were aligned with the static display of prices. These cells were used to receive mouse click commands to send trade orders at the price adjacent to the cell.</p>	<p>commands to send bid orders and the right hand column to enter commands to send ask orders. The cells in these columns were aligned with the static display of prices. These cells were used to receive mouse click commands to send trade orders at the price adjacent to the cell. In a later form, the cells in the "buy" and "sell" columns were used used to receive mouse click commands to send trade orders.</p>	
	<p>selecting a particular area in the order entry region through single action of the user input device with a pointer of the user input device positioned over the particular area to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange.</p>	<p>The GLWTP 4.31 includes bid order entry regions and offer order entry regions aligned with the static price axis. These are the "User" columns which contain multiple locations. By clicking in any one of these locations, it is possible to send a trade order. Specifically, the user right clicks on the cell in the User column to select the price and quantity. A subsequent left click sends the order. These two clicks can be performed in rapid succession, or alternatively the user can select the quantity, then wait till the appropriate moment to send the trade order (bid or ask) with a single additional click.</p> <p>By clicking on the cell in the User column in this manner, at least two</p>	<p>The GLWTP 4.51 includes bid order entry regions and offer order entry regions aligned with the static price axis. These are the "User" columns which contain multiple locations. By positioning the mouse over any one of these locations it is possible to set a plurality of trade order parameters and to send a trade order to an electronic exchange with a single action.</p> <p>Specifically, the user positions the mouse pointer over a cell in the User column and then performs a right click with the mouse to establish the price, the buy-sell indicator, and the quantity parameters for the order. This step can be performed at the moment the user wishes to send the order, or alternatively it can be</p>	<p>The ability to give a user the option of performing a final confirmation step (e.g. clicking OK in a popup window), or to disable the confirmation step in order to speed up the order entry, is well known in the prior art. See, for example, "A Summary of User Interface Design Principles"¹ for principles and examples of allowing a user to decide his or her "level of safety".</p> <p>In the PATS PTS Client system the user could</p>

¹ http://www.sylvantech.com/~talin/projects/ui_design.html

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
		<p>order parameters are set for the trade order: the order price, and the order size.</p> <p>GLWTP 4.50 operates in the identical fashion as GLWTP 4.31, however one additional mouse click, in a popup window, is required to send the bid or ask order. Assuming the claim covers pop-up windows, the GLWTP 4.50 operates in the identical fashion as 4.31 with the exception that the final mouse click operates on a location in the pop-up window.</p>	<p>performed minutes or hours earlier while the user waits for the appropriate moment to send the order.</p> <p>A second left click of the mouse sets these parameters into a trade order which can be immediately sent to the electronic exchange by performing a third click in a pop-up confirmation window. The GLWTP 4.51 system pre-positions the mouse cursor into the pop-up window so that the sequence of two or three clicks can be performed in a short period of time. In a later form, the user could preset the quantity by a right click in a cell in the "Pre" column. Once the quantity was preset. The user could send the order to the exchange with two left clicks of a mouse with the mouse cursor pre-positioned in the pop-up window.</p>	<p>disable the confirmation window. Nicholas Garrow Deposition, 5/26/05, at 32-33</p> <p>Midas Kapiti implemented a feature in Market Trader which allowed the user to decide between using a "confirm send" dialog box, or not, by selecting a user preference for this function, which was saved in the Windows NT registry and controlled the future behavior of the system. Midas Kapiti Market Trader Users Guide, March 1998, at G0105700.</p> <p>If this feature were added to GLWTP 4.50 or GLWTP 4.51 then the final confirmation mouse click in the popup window could be eliminated in a manner which would have been obvious to persons skilled in the art of user interface design.</p>

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
2	A method of placing a trade order according to claim 1 wherein said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order entry region and wherein said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order region.	The GLWTP 4.31 and 4.50 include two columns labeled "User" – the leftmost column is for entry of bid orders and the rightmost column for entry of ask orders. The two columns correspond to the "bid order entry region" and the "ask order region". As noted above the single action of GLWTP 4.50 consists of two clicks, the first of which is within the bid order entry region or the ask order region, and the second of which is within a popup region.	The GLWTP 4.51 includes two columns labeled "User" – the leftmost column is for entry of bid orders and the rightmost column for entry of ask orders. The two columns correspond to the "bid order entry region" and the "ask order region". As noted above the single action of GLWTP 4.51 consists of two clicks, the first of which is within the bid order entry region or the ask order region, and the second of which is within a popup region. In a later form, the bid and ask order entry regions included the "buy" and "sell" columns.	
3.	A method of placing a trade order according to claim 2, wherein the trade order is for a pre-determined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.	The GLWTP 4.31 and 4.50 both include a feature for setting an order quantity prior to sending any orders. This predetermined fixed quantity is then used to create an order at the price corresponding to the position of the pointer in the User column, adjacent to the static price axis, at the time the single action is performed.	The GLWTP 4.51 includes a feature for setting an order quantity prior to sending any orders. This predetermined fixed quantity is then used to create an order at the price corresponding to the position of the pointer in the User column, adjacent to the static price axis, at the time the single action is performed. In a later form, the "Pre" columns are used to set a fixed quantity.	
7	A method of placing a trade order according to claim 2, further comprising canceling said trade order in response to a subsequent single action of the user input device	The GLWTP 4.31 and 4.50 both include a feature for cancelling a trade order through a single action consisting of depressing the F8 key followed by the enter key.	The GLWTP 4.51 includes a feature for cancelling a trade order through a single action consisting of depressing the F8 key followed by the enter key.	
8	A computer readable medium	The GLWTP 4.31 and 4.50 were	The GLWTP 4.51 was implemented	

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
	having program code recorded thereon, for execution on a computer having a graphical user interface and a user input device, to place a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, comprising:	implemented using computer programming languages which were translated into executable machine codes and recorded on a computer readable storage medium. These codes were executed on a computer with a graphical user interface and a user input device consisting of a keyboard and a mouse. The program codes allowed a user to display a market from an electronic exchange, including the inside market for a commodity consisting of the highest bid price and the lowest ask price. The GLWTP 4.31 and 4.50 codes included a method for placing orders using a mouse and keyboard as the user input device.	using computer programming languages which were translated into executable machine codes and recorded on a computer readable storage medium. These codes were executed on a computer with a graphical user interface and a user input device consisting of a keyboard and a mouse. The program codes allowed a user to display a market from an electronic exchange, including the inside market for a commodity consisting of the highest bid price and the lowest ask price. The Trading Pad 4.51 codes included a method for placing orders using a mouse and keyboard as the user input device.	
	a first program code for setting a preset parameter for the trade order;	The program codes of GLWTP 4.31 and 4.50 included instructions allowing the user to preset a quantity parameter for a trade order.	The program codes of GLWTP 4.51 included instructions allowing the user to preset a quantity parameter for a trade order.	
	a second program code displaying market depth of a commodity, through a dynamic display of a plurality of bids and a plurality of asks in the market for the commodity, including the bid and asks quantities of the commodity, aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move in response to a change in the inside market;	The program codes of GLWTP 4.31 and 4.50 included instructions to display the best bid and best ask prices of a commodity, utilizing a static display of prices and a dynamic display of the best bid and best ask quantities, aligned with the static price display. The price display did not move or change when the inside market changed.	The program codes of GLWTP 4.51 included instructions to display the market depth of commodities by presenting bid and ask quantities corresponding to orders in the market in columns labeled BidQty and AskQty. These two columns consisted of cells which were aligned with a common static price axis. The price axis did not move or change when the market orders, including the inside market (best bid and best ask)	The program codes of GLWTP 4.31 and 4.50 could have been readily enhanced to display a plurality of bids and offers, i.e. the market depth, through any of a number of approaches well known in the art. See, for example, INTEX (1984) SPATS (1986)

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
			<p>changed. In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.</p>	<p>GLOBEX (1992) MINEX (1993) IPE (1995) OM Click (1995) MEFF (1996) TIFFE (1996) CUBS (1997) SWX (1996) TSE (1998) PATS (1998) By adding code to display additional bid and ask quantities, in addition to the best bid and best ask, the program would have yielded the predictable result and would have displayed market depth in the manner claimed in the patent, for example in the manner demonstrated in GLWTP 4.51.</p>
	<p>a third program code for displaying an order entry region comprising a plurality of areas for receiving commands from the user input device to send trade orders, aligned with the static display of prices, each area corresponding to a price of the static display of prices; and</p>	<p>The program codes of GLWTP 4.31 and 4.50 included instructions for displaying two order entry regions, lwhich included the "User" columns, each of which consisted of a vertical array of cells that were aligned with a common static display of prices. The order entry regions were programmed to receive commands from the pointer device (mouse) to send bid or</p>	<p>The program codes of GLWTP 4.51 included instructions for displaying two order entry regions, which included the "User" each of which consisted of a vertical array of cells that were aligned with a common static display of prices. The order entry regions were programmed to receive commands from the pointer device (mouse) to send bid or ask</p>	

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
		ask trade orders whose prices corresponded to the adjacent price in the static price display.	trade orders whose prices corresponded to the adjacent price in the static price display. In the later forms, the "buy" and "sell" columns were used to send trade orders.	
	a fourth program code for receiving a command as a result of a selection of a particular area in the order entry region by a single action of the user input device with a pointer of the user input device positioned over the particular area, to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange	The program codes of GLWTP 4.31 and 4.50 included instructions which received commands that resulted from positioning the mouse over one of the order entry cells in the bid User column or the ask User column and clicking one time to set certain trade order parameters including quantity, price and bid/ask indicator. A second mouse click (in 4.31) sends the trade order to the electronic exchange. In 4.50 a third mouse click, which takes place in a popup window without any subsequent user motion of the mouse, sends the trade order to the electronic exchange. The two or three clicks (4.31 or 4.50) constitute a single action in that they that can be performed within a short period of time.	The program codes of GLWTP 4.51 included instructions which received commands that resulted from positioning the mouse over one of the order entry cells in the bid User column or the ask User column and clicking one time to set certain trade order parameters including quantity, price and bid/ask indicator. A second mouse click displays the trade order in a popup window with the mouse pre-positioned to allow an immediate third click which sends the order to the electronic exchange. The two clicks constitute a single action in that they that can be performed within a short period of time. In a later form, the mouse was positioned over a cell in the "buy" or "ask" column.	
9	A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 8, further comprising program code for establishing that said trade order is a buy order if the position of the pointer at the time of said single	The program codes of GLWTP 4.31 and 4.50 were recorded on a computer readable medium and were executed on a computer, and included instructions to create two order entry regions, one for entry of buy orders and one for entry of sell orders. The code determined whether the user's order was a buy or a sell depending	The program codes of GLWTP 4.51 were recorded on a computer readable medium and were executed on a computer, and included instructions to create two order entry regions, one for entry of buy orders and one for entry of sell orders. The code determined whether the user's order was a buy or a sell depending	

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
	action is within a bid order entry and that said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region.	on which of these two regions were selected using the pointing device.	on which of these two regions were selected using the pointing device.	
10	A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, further comprising program code for establishing that the trade order is for a predetermined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.	The program codes of GLWTP 4.31 and 4.50 were recorded on a computer readable medium and were executed on a computer, and included instructions for setting an order quantity prior to sending any orders. This predetermined fixed quantity is then used by the code to create an order at the price corresponding to the position of the pointer in the User column, adjacent to the static price axis, at the time the single action is performed.	The program codes of GLWTP 4.51 were recorded on a computer readable medium and were executed on a computer, and included instructions for setting an order quantity prior to sending any orders. This predetermined fixed quantity is then used by the code to create an order at the price corresponding to the position of the pointer in the User column, or, In a later form, the "buy" and "sell" columns, adjacent to the static price axis, at the time the single action is performed.	
14	A client system for placing a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, the system comprising:	The GLWTP 4.31 and 4.50 software was executed on a client personal computer system enabling that client system to place orders on electronic commodity exchanges which had a best bid and a best ask (the inside market).	The GLWTP 4.51 software was executed on a client personal computer system enabling that client system to place orders on electronic commodity exchanges which had a best bid and a best ask (the inside market).	
	a parameter setting component for setting a preset parameter for the trade order	The GLWTP 4.31 and 4.50 client system included a component which allowed a quantity parameter to be preset prior to sending a trade order.	The GLWTP 4.51 client system included a component which allowed a quantity parameter to be preset prior to sending a trade order.	
	a display device for displaying market depth of a commodity, through a dynamic display of a plurality of bids and plurality of	The GLWTP 4.31 and 4.50 client system included a display device which displayed the best bid price and the best ask price for a traded	The GLWTP 4.51 client system included a display device which displayed a market depth for a traded commodity. This display consisted	The GLWTP 4.31 and 4.50 client system market display could have been enhanced

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
	asks in the market for the commodity, including the bid and ask quantities for the commodity, aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move when the inside market changes,	commodity. This display consisted of a static display of prices that did not change or move when the inside market changed. Aligned with the static price display was a dynamic display of the quantities associated with the best bid and best ask orders.	of a static display of prices that did not change or move when the inside market changed. Aligned with the static price display was a dynamic display of the quantities associated with bid and ask orders, including the best bid and the best ask (the inside market).	through techniques well known in the art to dynamically display additional bid and ask quantities. See the following: INTEX (1984) SPATS (1986) GLOBEX (1992) MINEX (1993) IPE (1995) OM Click (1995) MEFF (1996) TIFFE (1996) CUBS (1997) SWX (1996) TSE (1998) PATS (1998) By utilizing the same client component (the market display) and adding the display of additional bid and ask quantities (for example as in GLWTP 4.51), the GLWTP 4.31 and 4.50 client system would have yielded the predictable result and incorporated all of the features of this claim element.
	and for displaying an order entry region aligned with the static	The GLWTP 4.31 and 4.50 client system display included two columns	The GLWTP 4.51 client system display included two columns headed	

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	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
	display of prices, comprising a plurality of areas for receiving commands to send trade orders, each area corresponding to a price of the static display of prices;	headed "User" – the left hand column was used to enter commands to send bid orders and the right hand column to enter commands to send ask orders. The cells in these columns were aligned with the static display of prices and each cell corresponded to a price in the static price display.	"User" – the left hand column was used to enter commands to send bid orders and the right hand column to enter commands to send ask orders. The cells in these columns were aligned with the static display of prices and each cell corresponded to a price in the static price display. In a later form, the "buy" and "sell" columns were used to send trade orders.	
	a user input device for positioning a pointer thereof over an area in the order entry region; and	The GLWTP 4.31 and 4.50 client system included a mouse as a pointer device allowing user input in any of the "User" cells of the order entry region.	The GLWTP 4.51 client system included a mouse as a pointer device allowing user input in any of the "User" cells, and In a later form, the "buy" and "sell" columns, of the order entry region.	
	a trade order sending component for receiving a command as a result of a selection of the area in the order entry region by a single action of the user input device with a pointer of the user input device positioned over the area, to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange	The GLWTP 4.31 and 4.50 client system included a component which responded to commands to send an order to the electronic exchange. This component received a command to set a quantity parameter, a bid/ask parameter, and a price parameter based on the cell of the "User" column in the order entry region which was selected with the mouse. A second click of the user input device caused the trade order sending component to send the order to the	The GLWTP 4.51 client system included a component which responded to commands to send an order to the electronic exchange. This component received a command to set a quantity parameter, a bid/ask parameter, and a price parameter based on the cell of the "User" column in the order entry region which was selected with the mouse. A second click of the user input device caused the trade order sending component to send the order to the	The ability to give a user the option of performing a final confirmation step (e.g. clicking OK in a popup window), or to disable the confirmation step in order to speed up the order entry, is well known in the prior art. See, for example, "A Summary of User Interface Design Principles" ² or

² http://www.sylvantech.com/~talin/projects/ui_design.html

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
		<p>electronic exchange in the 4.31 version. In the 4.50 version one additional mouse click was required to cause the trade order sending component to send the order to the electronic exchange.</p>	<p>electronic exchange. In a later form, the "buy" and "sell" columns were used to send orders.</p>	<p>“Configuration – Opera Software”³, for principles and examples of allowing a user to decide his or her “level of safety”.</p> <p>In the PATS PTS Client system the user could disable the confirmation window. Nicholas Garrow Deposition, 5/26/05, at 32-33</p> <p>Midas Kapiti implemented a feature in Market Trader which allowed the user to decide between using a “confirm send” dialog box, or not, by selecting a user preference for this function, which was saved in the Windows NT registry and controlled the future behavior of the system. Midas Kapiti Market Trader Users Guide, March 1998, at G0105700.</p>

³ <http://web.archive.org/web/19980624131034/www.operasoft.com/support/config.htm>

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
				If this feature were added to GLWTP 4.50 or GLWTP 4.51 then the final confirmation mouse click in the popup window could be eliminated in a manner which would have been obvious to persons skilled in the art of user interface design.
15	A client system for placing a trade order for a commodity according to claim 14, wherein said trade order sending component establishes that said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order region and that said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region	The GLWTP 4.31 and 4.50 client system provided two columns labeled "User" and each column consisted of a vertical array of cells. The leftmost User column was for sending Bid trade orders and the rightmost User column was for sending Ask trade orders. The trade order sending component determined whether the order was a Bid or an Ask based on which of the two User columns received the mouse click action.	The GLWTP 4.51 client system provided two columns labeled "User" and each column consisted of a vertical array of cells. The leftmost User column was for sending Bid trade orders and the rightmost User column was for sending Ask trade orders. In a later form, the "buy" and "sell" columns were used for placing orders. The trade order sending component determined whether the order was a Bid or an Ask based on which of the two User columns (or buy/sell column) received the mouse click action.	
16	A client system for placing a trade order for a commodity according to claim 15, wherein said trade order sending component establishes that the trade order is for a pre-determined fixed quantity and for a price corresponding to the position of the pointer at the time of said	The GLWTP 4.31 and 4.50 client system provided a means to establish a pre-defined quantity parameter for trade orders. The price of the trade order was determined by which cell in the User column was clicked. These cells were aligned with prices in the static price axis. The trade	The GLWTP 4.51 client system provided a means to establish a pre-defined quantity parameter for trade orders. The price of the trade order was determined by which cell in the User column, or In a later form, which cell in the buy or sell columns, was clicked. These cells were	

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
	single action.	order component placed the trade order based on the side (bid or ask) and the pre-defined quantity and the price (adjacent to the cell that was clicked).	aligned with prices in the static price axis. The trade order component placed the trade order based on the side (bid or ask) and the pre-defined quantity and the price (adjacent to the cell that was clicked).	
20	A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said bids and asks in a vertical orientation.	The GLWTP 4.31 and 4.50 displayed the inside market, consisting of the best bid and the best ask, in a vertical orientation.	The GLWTP 4.51 displayed market depth, consisting of the bids and asks in the market, in a vertical orientation.	Extending the vertical display of GLWTP 4.31 and 4.50 to include additional bid and ask quantities in the market depth could have been achieved using any of the methods well known in the art, for example: INTEX (1984) SPATS (1986) GLOBEX (1992) MINEX (1993) IPE (1995) OM Click (1995) MEFF (1996) TIFFE (1996) CUBS (1997) SWX (1996) TSE (1998) PATS (1998)
22	A method according to claim 1, wherein a plurality of said displayed bids and asks in the market include bid and ask quantities of the commodity	The GLWTP 4.30 and 4.51 displayed the market best bid and market best ask orders by displaying their respective quantities in the BidQty and the AskQty column respectively.	The GLWTP 4.51 displayed the market bids and market asks by displaying the market bid and ask quantities in the BidQty and the AskQty columns respectively. In a later form the BidQty and the AskQty columns were replaced by	Extending the market quantity display of GLWTP 4.31 and 4.50 to include additional bid and ask quantities in the market depth could have been achieved using any

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
			the SIZE columns.	of the methods well known in the art, for example: INTEX (1984) SPATS (1986) GLOBEX (1992) MINEX (1993) IPE (1995) OM Click (1995) MEFF (1996) TIFFE (1996) CUBS (1997) SWX (1996) TSE (1998) PATS (1998)
23	A method according to Claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said bids and asks in different colors	The GLWTP 4.31 and 4.50 displayed the best bid price in green and the best ask price in blue.	The GLWTP 4.51 displayed the best bid price in green and the best ask price in blue.	The motivation and method for providing color differentiation in user interfaces was well known to persons with ordinary skill in the art. Several prior art references for this capability have been cited in the body of this report.
24	A method according to claim 1, further comprising re-centering said prices corresponding to the bids and asks about an inside market price upon receipt of a re-centering instruction	The GLWTP 4.30 and 4.51 included a feature whereby the user can cause the range of prices on display to be adjusted so that the inside market (highest bid, lowest offer) is in the center of the display after the re-centering instruction. This feature was effected through use of the	The GL TP 4.51 included a feature whereby the user can cause the range of prices on display to be adjusted so that the inside market (highest bid, lowest offer) is in the center of the display after the re-centering instruction. This feature was effected through use of the "home" key.	

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
		"home" key.		
25	A method according to claim 1, further comprising dynamically displaying working orders in alignment with the prices corresponding thereto.	The GLWTP 4.31 and 4.50 included a component known as the "GL Nego" window, which contained the working orders for the user. This window had a clear relationship with the Trading Pad window, in that orders placed in Trading Pad appeared in GL Nego, and the prices of GL Nego referred to the prices in the static price axis of Trading Pad, and when an order executed in the market, its status changed in GL Nego, and it appeared as a last trade in Trading Pad. As the court has construed "aligned" and "corresponding to" to mean "in relationship with" then it is clear that GLWTP 4.31 and 4.50 dynamically displayed working orders as required by this claim.	The GLWTP 4.51 included a component known as the "GL Nego" window, which contained the working orders for the user. This window had a clear relationship with the Trading Pad window, in that orders placed in Trading Pad appeared in GL Nego, and the prices of GL Nego referred to the prices in the static price axis of Trading Pad, and when an order executed in the market, its status changed in GL Nego, and it appeared as a last trade in Trading Pad. As the court has construed "aligned" and "corresponding to" to mean "in relationship with" then it is clear that GLWTP 4.51 dynamically displayed working orders as required by this claim.	GLOBEX (1997 Manual) OM Click (1995 brochure) "Trading Room With a View" (1998) Guterman Patent PTS Client X-Trader; Royal Blue (Feb. 1999 ISV Man.)
26	A method of displaying according to claim 1, further comprising dynamically displaying entered orders in alignment with the prices corresponding thereto, wherein said entered orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.	The "GL Nego" component of GLWTP 4.31 and 4.50 included entered order information. The quantity of executed orders and average price of the fills was dynamically maintained in this component, which was associated with the Trading Pad component in which the market information was displayed.	The "GL Nego" component of GLWTP 4.51 included entered order information. The quantity of executed orders and average price of the fills was dynamically maintained in this component, which was associated with the Trading Pad component in which the market information was displayed.	"Trading Room With a View" – PATS PTS Application, TT X-Trader. IPE "Exchanges Put on New Game Faces" – MATIF NFC-VF, OM ORC Trading Application; Royal Blue (Feb. 1999 ISV Man.)
27	A method according to claim 1, wherein said displaying the market	The GLWTP 4.31 and 4.50 displayed the best bid and the best ask of the	The GLWTP 4.51 displayed the market depth of the electronically	

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
	depth of a commodity traded in a market further comprises displaying said statically displayed prices in at least one direction in numerical order.	electronically traded commodity using a vertical static price axis in ascending numerical order (from the top to the bottom of the display).	traded commodity using a vertical static price axis in ascending numerical order (from the top to the bottom of the display).	
28	A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said statically displayed prices along a single line in numerical order.	The GLWTP 4.31 and 4.50 displayed the best bid and the best ask of the electronically traded commodity using a vertical static price axis in ascending numerical order (from the top to the bottom of the display). The prices were arranged in a single vertical line.	The GLWTP 4.51 displayed the market depth of the electronically traded commodity using a vertical static price axis in ascending numerical order (from the top to the bottom of the display). The prices were arranged in a single vertical line.	
29	A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises dynamically displaying a last traded quantity for said commodity in alignment with the prices corresponding thereto.	The GLWTP 4.31 and 4.50 displayed the price of the last trade in the Trading Pad component.	The GLWTP 4.51 displayed the price of the last trade in the Trading Pad component.	The price and quantity of the last trade was displayed in the Ticker window of OM Click and in the PATSystem PTS application. It would have been obvious to display the quantity of the last trade in the Trading Pad component, for example in the "TrdVol" column of GLWTP 4.51 or at the bottom of the "Price" column of GLWTP 4.31 and 4.50. IRIS (Feb. 1999 ISV Man.); CBB (May 1998 Derivative Strategy Magazine)
30	A computer readable medium according to claim 8, further	The program codes of GLWTP 4.31 and 4.50 were stored on a computer	The program codes of GLWTP 4.51 were stored on a computer readable	

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
	comprising program code to ensure that said displayed bids, asks, and prices are oriented vertically.	readable medium and included instructions to orient the bids, the asks, and the prices in a vertical fashion.	medium and included instructions to orient the bids, the asks, and the prices in a vertical fashion.	
32	A computer readable medium according to claim 8, further comprising program code to ensure that a plurality of bids and asks in the market include bid and ask quantities of the commodity	The program codes of GLWTP 4.31 and 4.50 were stored on a computer readable medium and included instructions that displayed the quantity of the best bid order and the best ask order in the market for the commodity.	The program codes of GLWTP 4.51 were stored on a computer readable medium and included instructions that displayed the quantities of bid orders and ask orders in the market for the commodity.	The addition of program codes stored on a computer readable medium to GLWTP 4.31 and 4.50 enabling the software to display a plurality of bid and ask quantities could have been done using any of a number of techniques well known to persons of ordinary skill in the art. For example: INTEX (1984) SPATS (1986) GLOBEX (1992) MINEX (1993) IPE (1995) OM Click (1995) MEFF (1996) TIFFE (1996) CUBS (1997) SWX (1996) TSE (1998) PATS (1998) all performed this function, and the resulting display would have looked identical to GLWTP 4.51.

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
33	A computer readable medium according to claim 8, further comprising program code to ensure that bids and asks are displayed in different colors.	The program codes of GLWTP 4.31 and 4.50 were stored on a computer readable medium and included instructions to display the price associated with the best bid in a different color than the price associated with the best ask.	The program codes of GLWTP 4.51 were stored on a computer readable medium and included instructions to display the price associated with the best bid in a different color than the price associated with the best ask.	The motivation and method for providing color differentiation in user interfaces was well known to persons with ordinary skill in the art. Several prior art references for this capability have been cited in the body of this report (paras x-x).
34	A computer readable medium according to claim 8, further comprising program code to ensure that said displayed prices corresponding to the bids and asks are re-centered about an inside market price upon receipt of a re-centering instruction.	The program codes of GLWTP 4.31 and 4.50 were stored on a computer readable medium and included instructions that re-centered the prices for the displayed bids and asks by displaying the best bid and the best ask at the center of the price range when a re-centering command was sent by the user. The "home" key was used for this purpose.	The program codes of GLWTP 4.51 were stored on a computer readable medium and included instructions that re-centered the prices for the displayed bids and asks by displaying the best bid and the best ask at the center of the price range when a re-centering command was sent by the user. The "home" key was used for this purpose.	
35	A computer readable medium according to claim 8 further comprising program code for dynamically displaying working orders in alignment with the prices corresponding thereto.	The program codes of GLWTP 4.31 and 4.50 were stored on a computer readable medium and included instructions that implemented a component known as the "GL Nego" window, which contained the working orders for the user. This window had a clear relationship with the Trading Pad window, in that orders placed in Trading Pad appeared in GL Nego, and the prices of GL Nego referred to the prices in the static price axis of Trading Pad,	The program codes of GLWTP 4.51 were stored on a computer readable medium and included instructions that implemented a component known as the "GL Nego" window, which contained the working orders for the user. This window had a clear relationship with the Trading Pad window, in that orders placed in Trading Pad appeared in GL Nego, and the prices of GL Nego referred to the prices in the static price axis of Trading Pad, and when an order	GLOBEX (1997 Manual) OM Click (1995 brochure) "Trading Room With a View" (1998) Gutterman Patent PTS Client X-Trader; Royal Blue (Feb. 1999 ISV Man.)

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
		and when an order executed in the market, its status changed in GL Nego, and it appeared as a last trade in Trading Pad. As the court has construed “aligned” and “corresponding to” to mean “in relationship with” then it is clear that GLWTP 4.31 and 4.50 dynamically displayed working orders as required by this claim.	executed in the market, its status changed in GL Nego, and it appeared as a last trade in Trading Pad. As the court has construed “aligned” and “corresponding to” to mean “in relationship with” then it is clear that GLWTP 4.51 dynamically displayed working orders as required by this claim.	
36	A computer readable medium according to claim 8, further comprising program code for dynamically displaying entered orders in alignment with the prices corresponding thereto, wherein said entered orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.	The program codes of GLWTP 4.31 and 4.50 were stored on a computer readable medium and included instructions that implemented a component known as the “GL Nego” window which included entered order information. The quantity of executed orders and average price of the fills was dynamically maintained in this component, which was associated with the Trading Pad component in which the market information was displayed.	The program codes of GLWTP 4.51 were stored on a computer readable medium and included instructions that implemented a component known as the “GL Nego” window which included entered order information. The quantity of executed orders and average price of the fills was dynamically maintained in this component, which was associated with the Trading Pad component in which the market information was displayed.	“Trading Room With a View” – PATS PTS Application, TT X-Trader. IPE “Exchanges Put on New Game Faces” – MATIF NFC-VF, OM ORC Trading Application; Royal Blue (Feb. 1999 ISV Man.)
37	A computer readable medium according to claim 8, further comprising program code to ensure that said statically displayed prices are displayed in at least one direction in numerical order.	The program codes of GLWTP 4.31 and 4.50 were stored on a computer readable medium and included instructions that displayed the price axis in ascending numerical order with the lowest displayed price at the top and the highest displayed price at the bottom.	The program codes of GLWTP 4.51 were stored on a computer readable medium and included instructions that displayed the price axis in ascending numerical order with the lowest displayed price at the top and the highest displayed price at the bottom.	
38	A computer readable medium according to claim 8, further comprising program code to ensure	The program codes of GLWTP 4.31 and 4.50 were stored on a computer readable medium and included	The program codes of GLWTP 4.51 were stored on a computer readable medium and included instructions	

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
	that said statically displayed prices are displayed along a single line in numerical order.	instructions that displayed the static prices in a single vertical line.	that displayed the static prices in a single vertical line.	
39	A computer readable medium according to claim 8, further comprising program code for dynamically displaying a last traded quantity for said commodity in alignment with the price corresponding thereto.	The program codes of GLWTP 4.31 and 4.50 were stored on a computer readable medium and included instructions that displayed the price of the last trade in the Trading Pad component.	The program codes of GLWTP 4.51 were stored on a computer readable medium and included instructions that displayed the price of the last trade in the Trading Pad component.	The price and quantity of the last trade was displayed in the Ticker window of OM Click. It would have been obvious to display the quantity of the last trade in the Trading Pad component, for example in the "TrdVol" column of GLWTP 4.51 or at the bottom of the "Price" column of GLWTP 4.31 and 4.50. IRIS (Feb. 1999 ISV Man.); CBB (May 1998 Derivative Strategy Magazine)
40	A client system according to claim 14, wherein said displays are oriented vertically.	The client system which implemented GLWTP 4.31 and 4.50 included a display of prices which were oriented vertically.	The client system which implemented GLWTP 4.51 included a display of prices which were oriented vertically.	
42	A client system according to claim 14, wherein said displays of the pluralities of bids and asks in the market include bid and ask quantities of the commodity.	The client system which implemented GLWTP 4.31 and 4.50 included a display which contained the quantity of the best bid and the quantity of the best ask for the commodity.	The client system which implemented GLWTP 4.51 included a display which contained the quantities of the bids and the asks in the market for the commodity.	The ability to enhance GLWTP 4.31 and 4.50 to display multiple bids and multiple asks could be done using techniques that were well known in the prior art. Adding additional bid and ask sizes that are aligned to the price axis

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
				<p>of GLWTP 4.31 and 4.50 would have yielded the predictable result of displaying market depth, as is seen in GLWTP 4.51.</p> <p>Other systems which displayed market depth included:</p> <p>INTEX (1984) SPATS (1986) GLOBEX (1992) MINEX (1993) IPE (1995) OM Click (1995) MEFF (1996) TIFFE (1996) CUBS (1997) SWX (1996) TSE (1998) PATS (1998)</p>
43	A client system according to claim 14, wherein said displays are displayed in different colors.	The client system which implemented GLWTP 4.31 and 4.50 included instructions to display the price associated with the best bid in a different color than the price associated with the best ask.	The client system which implemented GLWTP 4.51 included instructions to display the price associated with the best bid in a different color than the price associated with the best ask.	The motivation and method for providing color differentiation in user interfaces was well known to persons with ordinary skill in the art. Several prior art references for this capability have been cited in the body of this report (paras x-x).
44	A client system according to claim 14, where said display of prices	The client system which implemented GLWTP 4.31 and 4.50	The client system which implemented GLWTP 4.51 included	

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
	corresponding to the bids and asks is re-centered about an inside market price upon re-centering instruction from a user.	included a display whose price range could be re-centered in response to a re-centering command from a user. After re-centering the best bid and best ask (the inside market) were at the center of the price display. This feature was effected through use of the "home" key.	a display whose price range could be re-centered in response to a re-centering command from a user. After re-centering the best bid and best ask (the inside market) were at the center of the price display. This feature was effected through use of the "home" key.	
45	A client system according to claim 14, further comprising a display of working orders displayed in alignment with the prices corresponding thereto.	The client system which implemented GLWTP 4.31 and 4.50 included a component known as the "GL Nego" window, which contained the working orders for the user. This window had a clear relationship with the Trading Pad window, in that orders placed in Trading Pad appeared in GL Nego, and the prices of GL Nego referred to the prices in the static price axis of Trading Pad, and when an order executed in the market, its status changed in GL Nego, and it appeared as a last trade in Trading Pad. As the court has construed "aligned" and "corresponding to" to mean "in relationship with" then it is clear that GLWTP 4.31 and 4.50 dynamically displayed working orders as required by this claim.	The client system which implemented GLWTP 4.51 included a component known as the "GL Nego" window, which contained the working orders for the user. This window had a clear relationship with the Trading Pad window, in that orders placed in Trading Pad appeared in GL Nego, and the prices of GL Nego referred to the prices in the static price axis of Trading Pad, and when an order executed in the market, its status changed in GL Nego, and it appeared as a last trade in Trading Pad. As the court has construed "aligned" and "corresponding to" to mean "in relationship with" then it is clear that GLWTP 4.51 dynamically displayed working orders as required by this claim.	GLOBEX (1997 Manual) OM Click (1995 brochure) "Trading Room With a View" (1998) Gutterman Patent PTS Client X-Trader; Royal Blue (Feb. 1999 ISV Man.)
46	A client system according to claim 14, wherein said display device displays entered orders in alignment with the prices corresponding thereto and wherein said entered	The client system which implemented GLWTP 4.31 and 4.50 included a component known as the "GL Nego" window which included entered order information. The	The client system which implemented GLWTP 4.51 included a component known as the "GL Nego" window which included entered order information. The	"Trading Room With a View" – PATS PTS Application, TT X-Trader. IPE

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
	orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.	quantity of executed orders and average price of the fills was dynamically maintained in this component, which was associated with the Trading Pad component in which the market information was displayed.	quantity of executed orders and average price of the fills was dynamically maintained in this component, which was associated with the Trading Pad component in which the market information was displayed.	"Exchanges Put on New Game Faces" – MATIF NFC-VF, OM ORC Trading Application; Royal Blue (Feb. 1999 ISV Man.)
47	A client system according to claim 14, wherein said static display of prices is displayed in at least one direction in numerical order.	The client system which implemented GLWTP 4.31 and 4.50 included a display in which the static price axis is in ascending numerical order from top to bottom.	The client system which implemented GLWTP 4.51 included a display in which the static price axis is in ascending numerical order from top to bottom.	
48	A client system according to claim 14, wherein said static display of prices is displayed along a single line in numerical order.	The client system which implemented GLWTP 4.31 and 4.50 included a display in which the static prices were aligned in a single vertical line in ascending numerical order.	The client system which implemented GLWTP 4.51 included a display in which the static prices were aligned in a single vertical line in ascending numerical order.	
49	A client system according to claim 14, wherein said display device displays a last traded quantity for said commodity in alignment with the price corresponding thereto.	The client system which implemented GLWTP 4.31 and 4.50 included a display that displayed the price of the last trade in the Trading Pad component.	The client system which implemented GLWTP 4.51 included a display that displayed the price of the last trade in the Trading Pad component.	The price and quantity of the last trade was displayed in the Ticker window of OM Click. It would have been obvious to display the quantity of the last trade in the Trading Pad component, for example in the "TrdVol" column of GLWTP 4.51 or at the bottom of the "Price" column of GLWTP 4.31 and 4.50. IRIS (Feb. 1999 ISV Man.); CBB (May 1998 Derivative

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
50	The method of claim 2, wherein the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.	<p>The GLWTP 4.31 and 4.50 include two columns labeled "User" – the leftmost column is for entry of bid orders and the rightmost column for entry of ask orders. The two columns correspond to the "bid order entry region" and the "ask order region".</p> <p>In GLWTP 4.31 and 4.50 the market bids are displayed to the left of the static vertical price axis. The market asks are displayed to the right of the static vertical price axis. A user's bid or ask is also a market bid or ask, and so the bid display region includes the left-hand User column, and the ask display region includes the right-hand User column. This, the bid order entry region is contained within the bid display region and hence it does overlap said region. Similarly, the ask order entry region is contained within the ask display region and hence it does overlap said region.</p>	<p>The GLWTP 4.51 included two columns labeled "User" – the leftmost column is for entry of bid orders and the rightmost column for entry of ask orders. The two columns correspond to the "bid order entry region" and the "ask order region".</p> <p>In GLWTP 4.51 the market bids are displayed to the left of the static vertical price axis. The market asks are displayed to the right of the static vertical price axis. A user's bid or ask is also a market bid or ask, and so the bid display region includes the left-hand User column, and the ask display region includes the right-hand User column. This, the bid order entry region is contained within the bid display region and hence it does overlap said region. Similarly, the ask order entry region is contained within the ask display region and hence it does overlap said region.</p>	Strategy Magazine)
51	A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, wherein the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.	The program codes of GLWTP 4.31 and 4.50 were stored on a computer readable medium and included instructions that implemented two columns labeled "User" – the leftmost column is for entry of bid orders and the rightmost column for entry of ask orders. The two columns correspond to the "bid order entry	The program codes of GLWTP 4.51 were stored on a computer readable medium and included instructions that implemented two columns labeled "User" – the leftmost column is for entry of bid orders and the rightmost column for entry of ask orders. The two columns correspond to the "bid order entry region" and	

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
		<p>region” and the “ask order region”.</p> <p>In GLWTP 4.31 and 4.50 the market bids are displayed to the left of the static vertical price axis. The market asks are displayed to the right of the static vertical price axis. A user’s bid or ask is also a market bid or ask, and so the bid display region includes the left-hand User column, and the ask display region includes the right-hand User column. This, the bid order entry region is contained within the bid display region and hence it does overlap said region. Similarly, the ask order entry region is contained within the ask display region and hence it does overlap said region.</p>	<p>the “ask order region”.</p> <p>In GLWTP 4.51 the market bids are displayed to the left of the static vertical price axis. The market asks are displayed to the right of the static vertical price axis. A user’s bid or ask is also a market bid or ask, and so the bid display region includes the left-hand User column, and the ask display region includes the right-hand User column. This, the bid order entry region is contained within the bid display region and hence it does overlap said region. Similarly, the ask order entry region is contained within the ask display region and hence it does overlap said region.</p>	
52	<p>A client system for placing a trade order for a commodity according to claim 15, wherein the bid order entry region overlaps with a bid display region and the ask order entry overlaps with an ask display region.</p>	<p>The client system which implemented GLWTP 4.31 and 4.50 included two columns labeled “User” – the leftmost column is for entry of bid orders and the rightmost column for entry of ask orders. The two columns correspond to the “bid order entry region” and the “ask order region”.</p> <p>In GLWTP 4.31 and 4.50 the market bids are displayed to the left of the static vertical price axis. The market asks are displayed to the right of the static vertical price axis. A user’s bid or ask is also a market bid or ask, and</p>	<p>The client system which implemented GLWTP 4.51 included two columns labeled “User” – the leftmost column is for entry of bid orders and the rightmost column for entry of ask orders. The two columns correspond to the “bid order entry region” and the “ask order region”.</p> <p>In GLWTP 4.51 the market bids are displayed to the left of the static vertical price axis. The market asks are displayed to the right of the static vertical price axis. A user’s bid or ask is also a market bid or ask, and so the bid display region includes the</p>	

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
		so the bid display region includes the left-hand User column, and the ask display region includes the right-hand User column. This, the bid order entry region is contained within the bid display region and hence it does overlap said region. Similarly, the ask order entry region is contained within the ask display region and hence it does overlap said region.	left-hand User column, and the ask display region includes the right-hand User column. This, the bid order entry region is contained within the bid display region and hence it does overlap said region. Similarly, the ask order entry region is contained within the ask display region and hence it does overlap said region	
53	The method of claim 1 wherein the market depth is based on an exchange order book and wherein the static display of prices does not move in response to the addition of a price to the exchange order book, the additional price comprising a displayed price.	The GLWTP 4.31 and 4.50 was used to display prices from an electronic exchange with a central order book. When the exchange sent a message corresponding to a new order in the order book, such message including the price, the type, and the size of the order, this information was displayed in the GLWTP 4.31 or 4.50 display in its correct position on one side or the other of the static price axis (bid quantities on the left, ask quantities on the right). If the new order corresponded to a price which did not previously have an order, it was displayed alongside the correct price and the price axis did not move. The only time the price axis moves is when the user presses the "home" key or the scroll arrows.	The GLWTP 4.51 was used to display prices from an electronic exchange with a central order book. When the exchange sent a message corresponding to a new order in the order book, such message including the price, the type, and the size of the order, this information was displayed in the GLWTP 4.51 display in its correct position on one side or the other of the static price axis (bid quantities on the left, ask quantities on the right). If the new order corresponded to a price which did not previously have an order, it was displayed alongside the correct price and the price axis did not move. The only time the price axis moves is when the user presses the "home" key or the scroll arrows.	
54	The method of claim 53 wherein the static display of prices does not move in response to the removal of a price from the exchange order	The GLWTP 4.31 and 4.50 received order removal messages from the electronic exchange which caused GLWTP 4.51 to remove the	The GLWTP 4.51 received order removal messages from the electronic exchange which caused GLWTP 4.51 to remove the corresponding quantity	

	'132 CLAIM ELEMENT	GL WIN V4.31 and V4.50	GL WIN V4.51	Other Prior Art
	book, the removed price comprising a displayed price.	corresponding quantity from the BidQty or AskQty columns. When this occurred the static display of prices did not move. The only time the price axis moves is when the user presses the "home" key or the scroll arrows.	from the BidQty or AskQty columns. When this occurred the static display of prices did not move. The only time the price axis moves is when the user presses the "home" key or the scroll arrows. In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.	
56	The method of claim 1 wherein the plurality of additional parameters comprises a price and type of order.	The GLWTP 4.31 and 4.50 set the price parameter of the trade order and the Bid/Ask order type for the trade order based on the location of the mouse click and the preset quantity or the quantity that was clicked.	The GLWTP 4.51 set the price parameter of the trade order and the Bid/Ask order type for the trade order based on the location of the mouse click and the preset quantity or the quantity that was clicked.	

'304 Patent Claim Chart For Tradepad

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
1	A method for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid price and a lowest ask price on a graphical user interface, the method comprising:	GL Trading Pad (GLWTP) versions 4.31 and 4.50 were each a method for displaying market information from electronic exchanges, including the inside market with the best bid and best offer price in a graphical user interface.	GL Trading Pad (GLWTP) 4.51 was a method for displaying market information from electronic exchanges, including the inside market with the best bid and best offer price in a graphical user interface.	
	dynamically displaying a first indicator in one of a plurality of locations in a bid display region each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the highest bid price currently available in the market;	The GLWTP 4.31 and 4.50 dynamically displayed the best bid quantity (the quantity of at least one order at the highest bid price in the market) in the bid quantity column (BidQty) in the location of that column which corresponded to the best bid price as displayed in the common static price axis. The price axis was static because it did not move on the screen unless the user specifically provided a re-centering or scrolling command. As the price or size of the best bid changes in the market, the indicator for that best bid is updated in its correct position relative to the static price axis.	The GLWTP 4.51 dynamically displayed the best bid quantity (the quantity of at least one order at the highest bid price in the market) in the bid quantity column (BidQty) (Size column in a later form) in the location of that column which corresponded to the best bid price as displayed in the common static price axis. The price axis was static because it did not move on the screen unless the user specifically provided a re-centering or scrolling command. As the price or size of the best bid changes in the market, the indicator for that best bid is updated in its correct position relative to the static price axis.	
	dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the common static price	The GLWTP 4.31 and 4.50 dynamically displayed the best ask quantity (the quantity of at least one order at the lowest ask price in the market) in the ask quantity column (AskQty) in the location of that	The GLWTP 4.51 dynamically displayed the best ask quantity (the quantity of at least one order at the lowest ask price in the market) in the ask quantity column (AskQty) (Size column in a later form) in the	

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
	axis, the second indicator representing quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;	column which corresponded to the best ask price as displayed in the common static axis. The price axis was static because it did not move on the screen unless the user specifically provided a re-centering or scrolling command. As the price or size of the best ask changed in the market, the indicator for that best bid was updated in its correct position relative to the static price axis.	location of that column which corresponded to the best ask price as displayed in the common static axis. The price axis was static because it did not move on the screen unless the user specifically provided a re-centering or scrolling command. As the price or size of the best ask changed in the market, the indicator for that best bid was updated in its correct position relative to the static price axis.	
	displaying the bid and ask display regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid and ask display regions relative to the common static price axis;	In the GLWTP 4.31 and 4.50 display, the price axis does not move up or down (i.e. the price levels do not change) when the inside market consisting of the best bid and best ask change their price or quantity. Thus, the best bid and/or best ask indicators (quantities) in GLWTP 4.31 and 4.50 move (in the BidQty or AskQty column) while the price axis remains static.	In the GLWTP 4.51 display, the price axis does not move up or down (i.e. the price levels do not change) when the inside market consisting of the best bid and best ask change their price or quantity. Thus, the best bid and/or best ask indicators (quantities) in GLWTP 4.51 move (in the BidQty or AskQty column) (in the Size column in a later form) while the price axis remains static.	
	displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and	The GLWTP 4.31 includes bid order entry regions and offer order entry regions aligned with the static price axis. These are the "User" columns which contain multiple locations. By clicking any one of these locations, it is possible to send a trade order. Specifically, in GLWTP 4.31 the user right clicks on a cell in the User column to select the price and quantity. This step can be done	GLWTP 4.51 operates in the identical fashion as GLWTP 4.50. In a later form, the user clicks on the "Buy" or "Sell" columns to place a trade order with the mouse pre-positioned in the pop-up window.	

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
		<p>seconds, minutes, or hours before the order is ready to be sent. At the moment the user wishes to trade, a single left mouse click in the same location of the User column sends the trade order to the exchange.</p> <p>Assuming the claim covers pop-up windows, the GLWTP 4.50 operates in the identical fashion as 4.31 with the exception that the second mouse click brings up a pop-up window, and a third mouse click in that popup window sends the trade order.</p>		
	<p>in response to a selection of a particular location of the order entry region by a single action of a user input device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.</p>	<p>In GLWTP 4.31 and 4.50 the response to selection of a particular order entry location includes setting the buy or sell indicator, the order price, and the order size parameters.</p> <p>In the 4.31 version, the order is sent to the electronic exchange in response to the same mouse click which sets the plurality of trade order parameters, i.e. the mouse click in the order entry region.</p> <p>Assuming the claim covers pop-up windows, in the 4.50 version the second mouse click in the pop-up window sends the order to the electronic exchange.</p>	<p>GLWTP 4.51 operates in the identical fashion as GLWTP 4.50. In a later form, the user places orders from the "Buy" or "Sell" columns with two left clicks of the mouse and the mouse cursor pre-positioned in the pop-up window.</p>	<p>The "confirmation window" of GLWTP 4.50 and 4.51, which was not present in GLWTP 4.31, is a feature which provides users with an extra degree of confidence that the system will perform the action which they intend. It was typical in the design of graphical user interfaces to provide users with such "Are you sure?" confirmation windows, however it was also commonplace in the art to provide optional configurations</p>

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
				to bypass this step. See, for example, references 1 and 2. If GLWTP 4.50 and 4.51 had been combined with such a configuration feature to suppress the popup confirmation, then these versions would have sent an order with a single mouse click, as is seen in GLWTP 4.31.
2	The method of claim 1 wherein the bid and ask display region comprises columns with a plurality of cells that are displayed as a grid such that the cells of each column are aligned.	In GLWTP 4.31 and 4.50 the BidQty and AskQty columns contain a plurality of cells that are displayed as a grid such that the cells in these two columns are aligned with each other and with the common static price axis.	Same as GLWTP 4.31 and 4.50. In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.	
3	The method of claim 1 wherein the bid and ask display regions and the order entry region are oriented vertically.	In GLWTP 4.31 and 4.50, the BidQty and AskQty and User columns are oriented vertically.	Same as GLWTP 4.31 and 4.50. In a later form, the "size", "buy" and "sell" columns are oriented vertically.	
5	The method of claim 1 wherein one of the plurality of locations of bid display region comprises a blank region in which there is no first indicator displayed.	In GLWTP 4.31 and 4.50, the locations in the BidQty column are blank if there is no corresponding bid at that price in the market.	Same as GLWTP 4.31 and 4.50. In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.	
6	The method of claim 1 wherein one of the plurality of locations of the ask display region comprises a blank region in which there is no first indicator displayed.	In GLWTP 4.31 and 4.50, the locations in the AskQty column are blank if there is no corresponding ask at that price in the market.	Same as GLWTP 4.31 and 4.50.	
7	The method of claim 1 comprising the step of displaying at least a	GLWTP 4.31 and 4.50 display a common static price axis, which is a	Same as GLWTP 4.31 and 4.50.	

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
	portion of the common static price axis in a price display region.	subset of the entire range of prices which are available. These prices are displayed in a vertical grid in the column labeled "Price" (the "price display region").		
8	The method of claim 7 wherein the bid display region and the ask display region, the order entry region and the price display region comprise columns with a plurality of cells that are displayed as a grid such that the cells of each column are aligned.	In GLWTP 4.31 and 4.50, the BidQty and AskQty columns each consist of a vertical grid of cells that are aligned to one another and to the common static price axis (the "Price" column). Additionally there are two columns labeled "User" which are aligned to the common static price axis and are used for entry of trade orders.	Same as 4.31 and 4.50. In a later form, the "size", "buy" and "sell" columns are aligned to one another and displayed as a grid.	
9	The method of claim 7 wherein the bid display region, the ask display region, the order entry region and the price display region are oriented vertically.	In GLWTP 4.31 and 4.50, the BidQty, AskQty, the two User columns, and the Price column are all oriented vertically.	Same as GLWTP 4.31 and 4.50. In a later form, the size, buy and sell regions are oriented vertically.	
11	The method of claim 1 further comprising the steps of: dynamically displaying a third indicator at one of the plurality of locations in the bid display region, the third indicator representing quantity associated with at least one order to buy the commodity at a price different than the highest bid price currently available in the market; and	GLWTP 4.31 and 4.50 do not display a third indicator.	GLWTP 4.51 dynamically displays bid quantities which correspond to bids that are at prices different from the best bid. These bid quantities are displayed in one of the locations in the BidQty column (size column in a later form).	It would have been obvious to someone with ordinary skills in the art to use the Price axis and the BidQty column of GLWTP 4.31 or 4.50 to display additional bid quantities. For example, INTEX (1984) SPATS (1986) GLOBEX (1992) MINEX (1993) IPE (1995) OM Click (1995) MEFF (1996) TIFFE (1996)

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
				CUBS (1997) SWX (1996) TSE (1998) PATS (1998) all performed this function, and the resulting display would have looked identical to GLWTP 4.51
	dynamically displaying a fourth indicator at one of the plurality of locations in the ask display region, the fourth indicator representing quantity associated with at least one order to sell the commodity at a price different than the lowest ask price currently available in the market.	GLWTP 4.31 and 4.50 do not display a fourth indicator.	GLWTP 4.51 dynamically displays ask quantities which correspond to asks that are at prices different from the best ask. These ask quantities are displayed in one of the locations in the AskQty column (size column in a later form)	It would have been obvious to someone with ordinary skills in the art to use the Price axis and the AskQty column of GLWTP 4.31 or 4.50 to display additional ask quantities. For example, INTEX (1984) SPATS (1986) GLOBEX (1992) MINEX (1993) IPE (1995) OM Click (1995) MEFF (1996) TIFFE (1996) CUBS (1997) SWX (1996) TSE (1998) PATS (1998) all performed this function, and the resulting display would have looked identical to GLWTP 4.51
12	The method of claim 11 wherein a	In GLWTP 4.31 and 4.50, if there is	In GLWTP 4.51, if there is no bid in	

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
	location of the plurality of locations of the bid display region comprises a blank region in which there is no first or third indicator displayed.	no bid in the market corresponding to a price in the common static price axis, then the cell in the BidQty column is blank.	the market corresponding to a price in the common static price axis, then the cell in the BidQty column is blank. In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.	
13	The method of claim 1 wherein a location of the plurality of locations of the ask display region comprises a blank region in which there is no second or fourth indicator displayed.	In GLWTP 4.31 and 4.50, if there is no ask in the market corresponding to a price in the common static price axis, then the cell in the AskQty column is blank.	In GLWTP 4.51, if there is no ask in the market corresponding to a price in the common static price axis, then the cell in the AskQty column is blank.	
14	The method of claim 1 wherein the order entry region comprises: a bid order entry region comprising a plurality of locations for receiving commands to send buy orders, each location corresponding to a price level along the common static price axis; and	In the GLWTP 4.31 and 4.50, there are two columns headed "User." The leftmost user column has a vertical grid of cells which are used for receiving commands to send buy orders at the price corresponding to the adjacent price level in the common static price axis.	Same as GLWTP 4.31 and 4.50. In a later form, the "buy" column meets this limitation.	
	an ask order entry region comprising a plurality of locations for receiving commands to send sell orders, each location corresponding to a price level along the common static price axis.	In the GLWTP 4.31 and 4.50, there are two columns headed "User." The rightmost user column has a vertical grid of cells which are used for receiving commands to send sell orders at the price corresponding to the adjacent price level in the common static price axis.	Same as GLWTP 4.31 and 4.50. In a later form, the "sell" column meets this limitation.	
15	The method of claim 14 wherein the bid order entry region overlaps with the bid display region and the ask order entry region overlaps with the ask display region.	The GLWTP 4.31 and 4.50 include two columns labeled "User" – the leftmost column is for entry of bid orders and the rightmost column for entry of ask orders. The two columns correspond to the "bid order entry	The GLWTP 4.51 included two columns labeled "User" – the leftmost column is for entry of bid orders and the rightmost column for entry of ask orders. The two columns correspond to the "bid order entry	In TSE98 the bid and the ask order entry region included the cells in which the market bid quantity and market ask quantity were displayed,

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
		<p>region” and the “ask order region”.</p> <p>In GLWTP 4.31 and 4.50 the market bids are displayed to the left of the static vertical price axis. The market asks are displayed to the right of the static vertical price axis. A user’s bid or ask is also a market bid or ask, and so the bid display region includes the left-hand User column, and the ask display region includes the right-hand User column. This, the bid order entry region is contained within the bid display region and hence it does overlap said region. Similarly, the ask order entry region is contained within the ask display region and hence it does overlap said region.</p>	<p>region” and the “ask order region”. In a later form, it was the "buy" and "sell" columns.</p> <p>In GLWTP 4.51 the market bids are displayed to the left of the static vertical price axis. The market asks are displayed to the right of the static vertical price axis. A user’s bid or ask is also a market bid or ask, and so the bid display region includes the left-hand User column (buy column in a later form), and the ask display region includes the right-hand User column (sell column in a later form). This, the bid order entry region is contained within the bid display region and hence it does overlap said region. Similarly, the ask order entry region is contained within the ask display region and hence it does overlap said region.</p>	<p>which clearly constituted an overlapping region.</p>
16	<p>The method of claim 1 further comprising dynamically displaying an entered order indicator in association with the price levels arranged along the common static price axis.</p>	<p>GLWTP 4.31 and 4.50 implemented a component known as the “GL Nego” window which included entered order information. The quantity of executed orders and average price of the fills was dynamically maintained in this component, which was associated with the Trading Pad component in which the market information was displayed.</p>	<p>Same as GLWTP 4.31 and 4.50.</p>	<p>“Trading Room With a View” – PATS PTS Application, TT X-Trader. IPE “Exchanges Put on New Game Faces” – MATIF NFC-VF, OM ORC Trading Application; Royal Blue (Feb. 1999 ISV Man.)</p>
17	<p>The method of claim 16 wherein the entered order indicator is displayed</p>	<p>In GLWTP 4.31 and 4.50, the “GL Nego” component is an entered order</p>	<p>Same as GLWTP 4.31 and 4.50.</p>	<p>“Trading Room With a View” – PATS PTS</p>

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
	in an entered order region.	region.		Application, TT X-Trader. IPE "Exchanges Put on New Game Faces" – MATIF NFC-VF, OM ORC Trading Application; Royal Blue (Feb. 1999 ISV Man.)
18	The method of claim 1 further comprising dynamically displaying a last trade indicator in association with the common static price axis.	In GLWTP 4.31 and 4.50, the price of the last trade is indicated by displaying that price level in the common static price axis in red. This is the last trade indicator.	Same as GLWTP 4.31 and 4.50.	
19	the method of claim 18 wherein the last trade indicator is displayed in a last trade region.	In GLWTP 4.31 and 4.50, the common static price axis is the last trade region.	Same as GLWTP 4.31 and 4.50.	
20	The method of claim 1 further comprising the steps of: displaying the first indicator at a first location associated with a first price level on the common static price axis at a first time; and	In GLWTP 4.31 and 4.50, the best bid quantity is displayed adjacent to the price level of the common static price axis to which it applies (i.e. the price of the best bid). This is the "first indicator."	Same as GLWTP 4.31 and 4.50.	
	displaying the first indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.	In GLWTP 4.31 and 4.50, when the price of the best bid changes at a subsequent point in time, it is displayed adjacent to the price level of the common static price axis corresponding to the new price of the best bid.	Same as GLWTP 4.31 and 4.50.	
21	The method of claim 1 further comprising the steps of: displaying the second indicator at a first location associated with a first price level on the common static price	In GLWTP 4.31 and 4.50, the best ask quantity is displayed adjacent to the price level of the common static price axis to which it applies (i.e. the price of the best ask). This is the	Same as GLWTP 4.31 and 4.50.	

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
	axis at a first time; and	“second indicator.”		
	displaying the second indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.	In GLWTP 4.31 and 4.50, when the price of the best ask changes at a subsequent point in time, it is displayed adjacent to the price level of the common static price axis corresponding to the new price of the best ask.	Same as GLWTP 4.31 and 4.50.	
22	The method of claim 1 further comprising the steps of : displaying the first indicator at a first location associated with a particular price level on the common static price axis; and repositioning the common static price axis such that the first indicator is displayed at a second location associated with a particular price level on the common static price axis.	In GLWTP 4.31 and 4.50, the user can cause the common static price axis to be re-centered or repositioned by pressing the appropriate keys (the “home” or scroll keys). When this happens, the best bid indicator is displayed at a new location corresponding to the price of that best bid in the repositioned common static price axis.	Same as for GLWTP 4.31 and 4.50.	
23	The method of claim 1 further comprising the steps of: displaying the second indicator at a first location associated with a particular price level on the common static price axis; and repositioning the common static price axis such that the second indicator is displayed at a second location associated with the particular price level on the common static price axis.	In GLWTP 4.31 and 4.50, the user can cause the common static price axis to be re-centered or repositioned by pressing the appropriate keys (the “home” key or the scroll keys). When this happens, the best ask indicator is displayed at a new location corresponding to the price of that best ask in the repositioned common static price axis.	Same as for GLWTP 4.31 and 4.50.	
24	The method of claim 1 wherein the bid and ask display regions are displayed in different colors.	The GLWTP 4.31 and 4.50 displayed the best bid price in green and the best ask price in blue.	The GLWTP 4.51 displayed the best bid price in green and the best ask price in blue.	The motivation and method for providing color differentiation in user interfaces was well known to persons with

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
				ordinary skill in the art. Several prior art references for this capability have been cited in the body of this report.
25	The method of claim 1 wherein the first and second indicators are displayed in different colors.	In the GLWTP 4.31 and 4.50, the price corresponding to the best bid and the best ask are displayed in different colors.	Same as GLWTP 4.31 and 4.50.	The motivation and method for providing color differentiation in user interfaces was well known to persons with ordinary skill in the art. Several prior art references for this capability have been cited in the body of this report.
26	The method of claim 1 wherein the bid and ask display regions are displayed in a window further comprising centering the display of the first and second indicators in the window upon receipt of a centering instruction.	In the GLWTP 4.31 and 4.50, the BidQty and AskQty regions are displayed in a window. Further, the user can depress a key which causes the common static price axis to be shifted up or down so that the best bid and best ask indicators in the BidQty and AskQty regions are centered in the window. This can be effected by pressing the "home" key.	Same as GLWTP 4.31 and 4.50. In a later form the best bid and the best ask was displayed in the SIZE column.	
27	A computer readable medium having program code recorded thereon for execution on a computer for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid	The GLWTP 4.31 and 4.50 were implemented using computer programming languages translated into executable codes and stored on a readable medium. The computer codes facilitated the trading of a commodity in an electronic exchange having an inside market with a best	Same as GLWTP 4.31 and 4.50.	

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
	price and a lowest ask price on a graphical user interface, the program code causing a machine to perform the following method steps:	bid and lowest ask price on a graphical user interface.		
	dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the highest bid price currently available on the market;	The codes which implemented GLWTP 4.31 and 4.50 dynamically displayed the quantity of at least one order at the best bid price available on the market in the BidQty column, in the location of that column which corresponded with the best bid price as displayed in the common static price axis. The price axis was static because it did not move on the screen unless the user specifically provided a re-centering or scrolling command. As the price or size of the best bid changes in the market, the indicator for that best bid is updated in its correct position relative to the static price axis.	Same as for GLWTP 4.31 and 4.50. In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.	
	dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the common static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;	The codes which implemented GLWTP 4.31 and 4.50 dynamically displayed the quantity of at least one order at the best ask price available on the market in the AskQty column, in the location of that column which corresponded with the best ask price as displayed in the common static price axis. The price axis was static because it did not move on the screen unless the user specifically provided a re-centering or scrolling command. As the price or size of the best ask	Same as for GLWTP 4.31 and 4.50. In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.	

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
		changes in the market, the indicator for that best ask is updated in its correct position relative to the static price axis.		
	displaying the bid and ask display regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid and ask display regions relative to the common static price axis;	In the Trading Pad display, the price axis does not move up or down when the inside market consisting of the best bid and best ask change their price or quantity. Thus, the best bid and best ask indicators in the Trading Pad move while the price axis remains static.	Same as for GLWTP 4.31 and 4.50.	
	displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and	<p>The GLWTP 4.31 includes bid order entry regions and offer order entry regions aligned with the static price axis. These are the "User" columns which contain multiple locations. By clicking any one of these locations, it is possible to send a trade order.</p> <p>Assuming the claim covers pop-up windows, the GLWTP 4.50 operates in the identical fashion as 4.31 with the exception that a second mouse click in a pop-up window is required to send the trade order. This can be done very quickly (fraction of a second) without any movement of the pointing device.</p>	GLWTP 4.51 operates in the identical fashion as GLWTP 4.50. In a later form, the "buy" and "sell" columns were used to place orders.	
	in response to a selection of a particular location of the order entry region by a single action of a user	In GLWTP 4.31 and 4.50 the response to selection of a particular order entry location includes setting	GLWTP 4.51 operates in the identical fashion as 4.50. In a later form, the "buy" and "sell" columns	The pop-up "confirmation window" of GLWTP 4.50 and

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
	input device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.	<p>the buy or sell indicator, the order price, and the order size parameters.</p> <p>In the 4.31 version, the order is sent to the electronic exchange in response to a single mouse click in the order entry region.</p> <p>Assuming the claim covers pop-up windows, the GLWTP 4.50 operates in the identical fashion as 4.31 with the exception that a second mouse click in a pop-up window is required to send the trade order. This can be done very quickly (fraction of a second) without any movement of the pointing device.</p>	were used to place orders.	4.51, which was not present in GLWTP 4.31, is a feature which provides users with an extra degree of confidence that the system will perform the action which they intend. It was typical in the design of graphical user interfaces to provide users with such "Are you sure?" confirmation windows, however it was also commonplace in the art to provide optional configurations to bypass this step. See, for example, references 1 and 2. If GLWTP 4.50 and 4.51 had been combined with such a configuration feature to suppress the popup confirmation, then these versions would have sent an order with a single mouse click, as is seen in GLWTP 4.31.
28	The method of claim 11 wherein the first and third indicators are displayed in locations of the bid display region that are arranged along an axis which is parallel to	In GLWTP 4.31 and 4.50 the best bid is displayed in cells in the vertical BidQty column which is parallel to the vertical common static price axis.	In GLWTP 4.51, the best bid and the bids other than the best bid are displayed in cells in the vertical BidQty column which is parallel to the vertical common static price axis.	Extending the market quantity display of GLWTP 4.31 and 4.50 to include additional bid and ask quantities in the

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
	the common static price axis.		In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.	market depth could have been achieved using any of the methods well known in the art, for example: INTEX (1984) SPATS (1986) GLOBEX (1992) MINEX (1993) IPE (1995) OM Click (1995) MEFF (1996) TIFFE (1996) CUBS (1997) SWX (1996) TSE (1998) PATS (1998)
29	The method of claim 11 wherein the second and fourth indicators are displayed in locations of the ask display region that are arranged along an axis which is parallel to the common static price axis.	In GLWTP 4.31 and 4.50, the best ask is displayed in cells in the vertical AskQty column which is parallel to the vertical common static price axis.	In GLWTP 4.51, the best ask and the asks other than the best ask are displayed in cells in the vertical AskQty column which is parallel to the vertical common static price axis. In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.	Extending the market quantity display of GLWTP 4.31 and 4.50 to include additional bid and ask quantities in the market depth could have been achieved using any of the methods well known in the art, for example: INTEX (1984) SPATS (1986) GLOBEX (1992) MINEX (1993) IPE (1995) OM Click (1995) MEFF (1996) TIFFE (1996)

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
				CUBS (1997) SWX (1996) TSE (1998) PATS (1998)
30	The method of claim 11 comprising the steps of displaying the first indicator at a first location associated with a first price level on the common static price axis at a first time; and displaying the first indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.	In GLWTP 4.31 and 4.50, the best bid indicator (i.e. the best bid quantity) is displayed adjacent to the price level of the common static price axis to which it applies (i.e. the price of the best bid) If and when the price of the best bid changes at subsequent point in time, it is displayed adjacent to the price level of the common static price axis corresponding to the new price of the best bid.	In GLWTP 4.51, the best bid indicator (i.e. the best bid quantity) is displayed adjacent to the price level of the common static price axis to which it applies (i.e. the price of the best bid) If and when the price of the best bid changes at subsequent point in time, it is displayed adjacent to the price level of the common static price axis corresponding to the new price of the best bid.	
32	The method of claim 31 wherein each location of the bid display region corresponds to a different price level along the common static price axis and each location of the ask display region corresponds to a different price level along the common static price axis.	In GLWTP 4.31 and 4.50, the cells in the BidQty and AskQty columns each correspond to a different price level in the common static price axis, respectively.	In GLWTP 4.51, the cells in the BidQty and AskQty columns each correspond to a different price level in the common static price axis, respectively. In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.	
33	The method of claim 11 comprising the steps of: displaying the second indicator at a first location associated with a first price level on the common static price axis at a first time; and displaying the second indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to	In GLWTP 4.31 and 4.50, the best ask indicator (the quantity of the best ask) is displayed adjacent to the price level of the common static price axis to which it applies (the price of the best ask). When the price of the best ask changes at subsequent point in time, it is displayed adjacent to the price	In GLWTP 4.51, the best ask indicator (the quantity of the best ask) is displayed adjacent to the price level of the common static price axis to which it applies (the price of the best ask). When the price of the best ask changes at subsequent point in time, it is displayed adjacent to the price	

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
	the first time.	level of the common static price axis corresponding to the new price of the best ask.	level of the common static price axis corresponding to the new price of the best ask.	
34	The method of claim 33 wherein the third and fourth indicators remain in the same location in the bid and ask display regions, respectively, before and after the second indicator is displayed at the second location.		In GLWTP 4.51, when the best ask price changes and the indicator for the best ask moves to a second location, the bids and asks other than the best ask remain in their current location (unless their prices have changed as well). Thus, when the "second indicator" (the best ask quantity) moves to a new location (a new price), all other bids and asks remain in their same position (the third and fourth indicators).	Extending the market quantity display of GLWTP 4.31 and 4.50 to include additional bid and ask quantities in the market depth could have been achieved using any of the methods well known in the art, for example: INTEX (1984) SPATS (1986) GLOBEX (1992) MINEX (1993) IPE (1995) OM Click (1995) MEFF (1996) TIFFE (1996) CUBS (1997) SWX (1996) TSE (1998) PATS (1998)
35	The method of claim 34 wherein each location of the display region corresponds to a different price level along the common static price axis and each location of the ask display region corresponds to a different price level along the common static price axis.		In GLWTP 4.51, the cells in the BidQty and AskQty columns each correspond to a different price level in the common static price axis, respectively. In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.	Extending the market quantity display of GLWTP 4.31 and 4.50 to include additional bid and ask quantities in the market depth could have been achieved using any of the methods well known in the art, for example:

	'304 CLAIM ELEMENT	4.31 and 4.50	4.51	Other Prior Art
				INTEX (1984) SPATS (1986) GLOBEX (1992) MINEX (1993) IPE (1995) OM Click (1995) MEFF (1996) TIFFE (1996) CUBS (1997) SWX (1996) TSE (1998) PATS (1998)
36	The method of claim 1 wherein the bid and ask display regions are displayed separately.	In GLWTP 4.31 and 4.50, the BidQty and AskQty columns are displayed separately.	Same as in GLWTP 4.31 and 4.50. In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.	
37	The method of claim 1 wherein the first and second indicators are based on an exchange order book and wherein the price levels along the common static price axis do not move in response to the addition of a price to the exchange order book, the additional price comprising a price for where there is a corresponding displayed location in at least one of the bid and ask display regions.	In GLWTP 4.31 and 4.50, the common static price axis includes all prices in the range which is on display regardless of whether or not there is a bid or ask in the exchange order book at that price. Where there is no order at that price, the cell in the BidQty and/or AskQty column is blank. When an order is received for one of these blank cells, the indicator is placed into the correct cell and there is no motion of the common static price axis.	Same as GLWTP 4.31 and 4.50. In a later form the BidQty and the AskQty columns were replaced by the SIZE columns.	

EXHIBIT 3

'132 Patent Claim Chart for TSE98

	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
1	A method of placing a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, using a graphical user interface and a user input device, said method comprising:	TSE98 was an electronic exchange which included a user terminal device for entering trade orders. The market had an inside price consisting of a highest bid and a lowest offer. The inside market was displayed on a graphical user interface, and this, in conjunction with an input device consisting of a mouse and keyboard, provided a method for placing trade orders.	
	setting a preset parameter for the trade order	At least one of the parameters of a trade order – the “self” or “consigned” indicator, could be preset by the user. TSE000718.	
	displaying market depth of the commodity through a dynamic display of a plurality of bids and a plurality of asks in the market for the commodity, including at least a portion of the bid and ask quantities of the commodity	The depth of market, consisting of a subset of the bids lower than the best bid and asks higher than the best ask could be displayed on the graphical user interface. For each of these bids or asks the system displayed the quantity bid or offered at the relevant price. The display was dynamic in that it was automatically updated to reflect changes in the market. TSE000761-762.	
	the dynamic display being aligned with a static display of prices wherein the static display of prices does not move in response to a change in the inside market.	The dynamic display of bid and ask quantities was aligned with a static vertical price axis such that each bid or ask quantity was positioned beside the price to which it applied. When the user pressed one of the scroll keys this caused the price axis to remain fixed on the screen and the prices would not change in response to changes in the inside market. The prices remained fixed until the user pressed the HOME key. TSE000761-762 and deposition of Kida. ¹	
	displaying an order entry region aligned with the static display of prices comprising a plurality of areas for receiving commands to	The system displayed order entry regions located to the right and to the left of the static price axis, in which the user could double click to initiate a command to enter bid or ask trade orders, respectively. The areas to the right and the left of the	

¹ If automatic re-centering is included within the scope of the claim, then the basic board screen with its floating display would also fall within the static limitation.

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	send trade orders, each area corresponding to a price of the static display of prices; and	price axis consisted of a series of regions each corresponding to the adjacent price on the static price axis.	
	selecting a particular area in the order entry region through single action of the user input device with a pointer of the user input device positioned over the particular area to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange.	By double clicking on a particular area of the bid or ask order entry region (a single action) the TSE98 system would set the instrument, the price, the buy/sell indicator, and the self/consigned indicator for the trade order. This information would appear in the "order window" with the cursor positioned in the SIZE field. The user would enter the size (quantity) of the trade order and press the SEND key to send the order to the electronic exchange.	GLOBEX (1992) order size default Patsystems DOM Screen (Nov. 1998) Midas Kapiti X_Trader 1998 User Documentation Manual Release 3.10 Minex Nov. 1992 Service Outline Amazon 5,960,411 GLTP 4.31
2	A method of placing a trade order according to claim 1 wherein said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order entry region and wherein said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order region.	The region to the left of the price axis was for sending ask orders and the region to the right of the price axis was for sending bid orders. Depending on which side of the price axis the pointer was located when the mouse was clicked would determine whether the trade order was a bid or an ask.	
3.	A method of placing a trade order according to claim 2, wherein the trade order is for a pre-determined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.	The position of the pointer at the time of the double click (a single action) determined the price of the trade order. The quantity was not predetermined in TSE98.	GLOBEX size default X-Trader size default Patsystems DOM Screen (Nov. 1998) Minex Nov. 1992 Service Outline X_Trader 1998 User Documentation Manual

	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
			Release 3.10 Midas Kapiti FOE Window MarketTrader
7	A method of placing a trade order according to claim 2, further comprising canceling said trade order in response to a subsequent single action of the user input device		Datastream ICV (Liffe 1998 Directory) Patsystems PTS Client LIFFE APT - Promotional Brochure (DX 148 at pg. 4) Communicating Ltd. (2/1999 Liffe Directory) RTS (2/1999 ISV Manual) Minex 1992 Manual at pg. 12 INTEX / McCausland, column 23, lines 40-57.; column 25, lines 8-22.
8	A computer readable medium having program code recorded thereon, for execution on a computer having a graphical user interface and a user input device, to place a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, comprising:	The TSE98 system was implemented in computer codes which were recorded on a machine readable medium and executed on a computer with a graphical user interface and a user input device consisting of a keyboard and a mouse. These codes included instructions for placing trade orders for commodities on an electronic exchange with an inside market consisting of the highest bid price and the lowest ask price.	
	a first program code for setting a preset parameter for the trade order;	The program codes included instructions for setting a "self" or "consigned" parameter for trade orders.	
	a second program code displaying market depth of a commodity, through a dynamic display of a plurality of bids and a plurality of	The program codes included instructions for displaying the depth of market, consisting of a subset of the bids lower than the best bid and asks higher than the best ask, on the graphical user interface. For each of these bids or asks the system	

	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
	asks in the market for the commodity, including the bid and asks quantities of the commodity, aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move in response to a change in the inside market;	displayed the quantity bid or offered at the relevant price. The display was dynamic in that it was automatically updated to reflect changes in the market. TSE000761-762. The dynamic display of bid and ask quantities was aligned with a vertical price axis such that each bid or ask quantity was positioned beside the price to which it applied. When the user pressed one of the scroll keys this caused the price axis remained fixed on the screen and the prices would not change in response to changes in the inside market. The prices remained fixed until the user pressed the HOME or the SCROLL keys. TSE000761-762 and deposition of Kida.	
	a third program code for displaying an order entry region comprising a plurality of areas for receiving commands from the user input device to send trade orders, aligned with the static display of prices, each area corresponding to a price of the static display of prices; and	The program codes included instructions for displaying order entry regions located to the right and to the left of the static price axis, in which the user could double click to initiate a command to enter bid or ask trade orders, respectively. The areas to the right and the left of the price axis consisted of a series of regions each corresponding to the adjacent price on the static price axis.	
	a fourth program code for receiving a command as a result of a selection of a particular area in the order entry region by a single action of the user input device with a pointer of the user input device positioned over the particular area, to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange	The program codes included instructions for receiving commands resulting from the user double clicking in the order entry regions located to the right and to the left of the static price axis. The areas to the right and the left of the price axis consisted of a series of regions each corresponding to the adjacent price on the static price axis. By double clicking on a particular area of the bid or ask order entry region (a single action) the program codes of the TSE98 system would set the instrument, the price, the buy/sell indicator, and the self/consigned indicator for the trade order. This information would appear in the "order window" with the cursor positioned in the SIZE field. The user would enter the size (quantity) of the trade order and press the SEND key to send the order to the electronic exchange.	GLOBEX size default X-Trader size default Patsystems DOM Screen (Nov. 1998) Minex Nov. 1992 Service Outline X_Trader 1998 User Documentation Manual Release 3.10 Midas Kapiti FOE Window MarketTrader
9	A computer readable medium	The TSE98 system was implemented in computer codes which	

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	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
	having program code recorded thereon, for execution on a computer to place a trade order according to claim 8, further comprising program code for establishing that said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order entry and that said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region.	were recorded on a machine readable medium and executed on a computer and included instructions which established that the region to the left of the price axis was for sending ask orders and the region to the right of the price axis was for sending bid orders. Depending on which side of the price axis the pointer was located when the mouse was clicked would determine whether the trade order was a bid or an ask.	
10	A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, further comprising program code for establishing that the trade order is for a predetermined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.	The position of the pointer at the time of the double click (a single action) determined the price of the trade order. The quantity was not predetermined by the program codes of TSE98.	GLOBEX size default X-Trader size default Patsystems DOM Screen (Nov. 1998) Minex Nov. 1992 Service Outline X_Trader 1998 User Documentation Manual Release 3.10 Midas Kapiti FOE Window MarketTrader
14	A client system for placing a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, the system comprising:	TSE98 was implemented, in part, on a client system consisting of a PC with a graphical user interface, a keyboard, and a pointing device. It was used for placing trade orders on an electronic exchange. The electronic exchange had an inside market consisting of a highest bid and a lowest offer.	
	a parameter setting component for setting a preset parameter for the trade order	The client system included a component which allowed at least one of the parameters of a trade order – the “self” or “consigned” indicator, could be preset by the user. TSE000718.	

	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
	<p>a display device for displaying market depth of a commodity, through a dynamic display of a plurality of bids and plurality of asks in the market for the commodity, including the bid and ask quantities for the commodity, aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move when the inside market changes,</p>	<p>The client system included a component which allowed the depth of market, consisting of a subset of the bids lower than the best bid and asks higher than the best ask to be displayed on the graphical user interface. For each of these bids or asks the system displayed the quantity bid or offered at the relevant price. The display was dynamic in that it was automatically updated to reflect changes in the market. TSE000761-762.</p> <p>The dynamic display of bid and ask quantities was aligned with a static vertical price axis such that each bid or ask quantity was positioned beside the price to which it applied. When the user pressed one of the scroll keys this caused the price axis remained fixed on the screen and the prices would not change in response to changes in the inside market. The prices remained fixed until the user pressed the HOME key. TSE000761-762 and deposition of Kida.</p>	
	<p>and for displaying an order entry region aligned with the static display of prices, comprising a plurality of areas for receiving commands to send trade orders, each area corresponding to a price of the static display of prices;</p>	<p>The client system displayed order entry regions located to the right and to the left of the static price axis, in which the user could double click to initiate a command to enter bid or ask trade orders, respectively. The areas to the right and the left of the price axis consisted of a series of regions each corresponding to the adjacent price on the static price axis.</p>	
	<p>a user input device for positioning a pointer thereof over an area in the order entry region; and</p>	<p>The client system included a mouse as a user input device for positioning a pointer over any of the areas in the bid or ask order entry region.</p>	
	<p>a trade order sending component for receiving a command as a result of a selection of the area in the order entry region by a single action of the user input device with a pointer of the user input device positioned over the area, to set a plurality of additional parameters for the trade order and send the trade order to the</p>	<p>The client system included a component which received a command that was initiated by the user double clicking on a particular area of the bid or ask order entry region (a single action). The component would set the instrument, the price, the buy/sell indicator, and the self/consigned indicator for the trade order. This information would appear in the "order window" with the cursor positioned in the SIZE field. The user would enter the size (quantity) of the trade order and press the SEND key to send the order to the electronic</p>	<p>GLOBEX size default X-Trader size default Patsystems DOM Screen (Nov. 1998) Minex Nov. 1992 Service Outline X_Trader 1998 User Documentation Manual Release 3.10</p>

	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
	electronic exchange	exchange.	Midas Kapiti FOE Window MarketTrader
15	A client system for placing a trade order for a commodity according to claim 14, wherein said trade order sending component establishes that said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order region and that said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region	The TSE98 client system trade order component established that the region to the left of the price axis was for sending ask orders and the region to the right of the price axis was for sending bid orders. Depending on which side of the price axis the pointer was located when the mouse was clicked would determine whether the trade order was a bid or an ask.	
16	A client system for placing a trade order for a commodity according to claim 15, wherein said trade order sending component establishes that the trade order is for a pre-determined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.	The TSE98 client system trade order component established the price of the trade order based upon the position of the cursor at the time the order was initiated.	GLOBEX size default X-Trader size default Patsystems DOM Screen (Nov. 1998) Minex Nov. 1992 Service Outline X_Trader 1998 User Documentation Manual Release 3.10 Midas Kapiti FOE Window MarketTrader
20	A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said bids and asks in a vertical orientation.	The TSE98 system displayed the market depth consisting of bids and asks in a vertical orientation.	
22	A method according to claim 1, wherein a plurality of said displayed bids and asks in the	The TSE98 system displayed the quantity of the bid and ask orders in the market.	

	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
	market include bid and ask quantities of the commodity		
23	A method according to Claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said bids and asks in different colors		The motivation and method for providing color differentiation in user interfaces was well known to persons with ordinary skill in the art. Several prior art references for this capability have been cited in the body of this report.
24	A method according to claim 1, further comprising re-centering said prices corresponding to the bids and asks about an inside market price upon receipt of a re-centering instruction	The TSE98 system included a feature whereby the prices on the display could be made to be static, by pressing either the UP or DOWN scroll key. When in this mode the prices could be re-centered by pressing the HOME key. TSE000641 and Kida deposition.	
25	A method according to claim 1, further comprising dynamically displaying working orders in alignment with the prices corresponding thereto.		GLOBEX (1997 Manual) OM Click (1995 brochure) "Trading Room With a View" (1998) Gutterman Patent PTS Client X-Trader
26	A method of displaying according to claim 1, further comprising dynamically displaying entered orders in alignment with the prices corresponding thereto, wherein said entered orders indicate a quantity of		"Trading Room With a View" – PATS PTS Application, TT X-Trader. IPE "Exchanges Put on New

	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
	said commodity for which a trader's orders have been filled at said corresponding prices.		Game Faces” – MATIF NFC-VF, OM ORC Trading Application
27	A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said statically displayed prices in at least one direction in numerical order.	The TSE98 system displayed a price axis which was in numerical order from highest to lowest (top to bottom).	
28	A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said statically displayed prices along a single line in numerical order.	The TSE98 system displayed prices in a single vertical line in numerical order from highest to lowest.	
29	A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises dynamically displaying a last traded quantity for said commodity in alignment with the prices corresponding thereto.	The TSE98 system dynamically displayed the time and the price of the last five trades in association with the market depth display (TSE000753, page 7-17).	The price and quantity of the last trade was displayed in the Ticker window of OM Click and in the PATSystem PTS application. It would have been obvious to display the quantity of the last trade in the TSE98 display component, for example in item 19 of the display, beneath the last traded price.
30	A computer readable medium according to claim 8, further comprising program code to ensure	The computer readable medium of the TSE98 system included codes which displayed the market depth consisting of bids and asks in a vertical orientation.	

	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
	that said displayed bids, asks, and prices are oriented vertically.		
32	A computer readable medium according to claim 8, further comprising program code to ensure that a plurality of bids and asks in the market include bid and ask quantities of the commodity	The computer readable medium of the TSE98 system included codes which displayed the quantity of the bid and ask orders in the market.	
33	A computer readable medium according to claim 8, further comprising program code to ensure that bids and asks are displayed in different colors.		The motivation and method for providing color differentiation in user interfaces was well known to persons with ordinary skill in the art. Several prior art references for this capability have been cited in the body of this report.
34	A computer readable medium according to claim 8, further comprising program code to ensure that said displayed prices corresponding to the bids and asks are re-centered about an inside market price upon receipt of a re-centering instruction.	The computer readable medium of the TSE98 system included codes which allowed the prices on the display to be re-centered by pressing the HOME key. TSE000641 and Kida deposition.	
35	A computer readable medium according to claim 8 further comprising program code for dynamically displaying working orders in alignment with the prices corresponding thereto.		GLOBEX (1997 Manual) OM Click (1995 brochure) "Trading Room With a View" (1998) Gutterman Patent

	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
			PTS Client X-Trader Several prior art references for this capability have been cited in the body of this report.
36	A computer readable medium according to claim 8, further comprising program code for dynamically displaying entered orders in alignment with the prices corresponding thereto, wherein said entered orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.		“Trading Room With a View” – PATS PTS Application, TT X-Trader. IPE “Exchanges Put on New Game Faces” – MATIF NFC-VF, OM ORC Trading Application Several prior art references for this capability have been cited in the body of this report.
37	A computer readable medium according to claim 8, further comprising program code to ensure that said statically displayed prices are displayed in at least one direction in numerical order.	The computer readable medium of the TSE98 system included codes which displayed a price axis which was in numerical order from highest to lowest (top to bottom).	
38	A computer readable medium according to claim 8, further comprising program code to ensure that said statically displayed prices are displayed along a single line in numerical order.	The computer readable medium of the TSE98 system included codes which displayed prices in a single vertical line in numerical order from highest to lowest.	
39	A computer readable medium	The computer readable medium of the TSE98 system included	The price and quantity

	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
	according to claim 8, further comprising program code for dynamically displaying a last traded quantity for said commodity in alignment with the price corresponding thereto.	codes which dynamically displayed the time and the price of the last five trades in association with the market depth display (TSE000753, page 7-17).	of the last trade was displayed in the Ticker window of OM Click and in the PATSystem PTS application. It would have been obvious to display the quantity of the last trade in the TSE98 display component, for example in item 19 of the display, beneath the last traded price.
40	A client system according to claim 14, wherein said displays are oriented vertically.	The TSE98 client system displayed prices in a single vertical line.	
42	A client system according to claim 14, wherein said displays of the pluralities of bids and asks in the market include bid and ask quantities of the commodity.	The TSE98 client system displayed the quantity of the bid and ask orders in the market.	
43	A client system according to claim 14, wherein said displays are displayed in different colors.		The motivation and method for providing color differentiation in user interfaces was well known to persons with ordinary skill in the art. Several prior art references for this capability have been cited in the body of this report.
44	A client system according to claim 14, where said display of prices	The TSE98 client system included a feature whereby the prices on the display could be made to be static, by pressing	

	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
	corresponding to the bids and asks is re-centered about an inside market price upon re-centering instruction from a user.	either the UP or DOWN scroll key. When in this mode the prices could be re-centered around the inside market price by the user pressing the HOME key. TSE000641 and Kida deposition.	
45	A client system according to claim 14, further comprising a display of working orders displayed in alignment with the prices corresponding thereto.		GLOBEX (1997 Manual) OM Click (1995 brochure) "Trading Room With a View" (1998) Gutterman Patent PTS Client X-Trader Several prior art references for this capability have been cited in the body of this report.
46	A client system according to claim 14, wherein said display device displays entered orders in alignment with the prices corresponding thereto and wherein said entered orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.		"Trading Room With a View" – PATS PTS Application, TT X-Trader. IPE "Exchanges Put on New Game Faces" – MATIF NFC-VF, OM ORC Trading Application Several prior art references for this capability have been cited in the body of this report.
47	A client system according to claim 14, wherein said static display of	The TSE98 client system displayed the static prices in numerical order from lowest to highest (top to bottom).	

	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
	prices is displayed in at least one direction in numerical order.		
48	A client system according to claim 14, wherein said static display of prices is displayed along a single line in numerical order.	The TSE98 client system displayed the static prices in a single vertical line, in order from lowest to highest (top to bottom).	
49	A client system according to claim 14, wherein said display device displays a last traded quantity for said commodity in alignment with the price corresponding thereto.	The TSE98 client system dynamically displayed the time and the price of the last five trades in association with the market depth display (TSE000753, page 7-17).	The price and quantity of the last trade was displayed in the Ticker window of OM Click and in the PATSystem PTS application. It would have been obvious to display the quantity of the last trade in the TSE98 display component, for example in item 19 of the display, beneath the last traded price.
50	The method of claim 2, wherein the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.	The TSE98 system included a bid order entry region to the right of the price axis, and an ask order entry region to the left of the price axis. These regions included the portion of the display where the market bid and ask quantities were displayed (the bid and the ask display regions). Hence the bid and ask order entry regions overlapped the respective display regions.	
51	A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, wherein the bid order entry region overlaps with a bid display region and the ask	The computer readable medium of the TSE98 system included codes which implemented a bid order entry region to the right of the price axis, and an ask order entry region to the left of the price axis. These regions included the portion of the display where the market bid and ask quantities were displayed (the bid and the ask display regions). Hence the bid and ask order entry regions overlapped the respective display	

	'132 CLAIM ELEMENT	TSE '98	Other Prior Art
	order entry region overlaps with an ask display region.	regions.	
52	A client system for placing a trade order for a commodity according to claim 15, wherein the bid order entry region overlaps with a bid display region and the ask order entry overlaps with an ask display region.	The TSE98 client system included a bid order entry region to the right of the price axis, and an ask order entry region to the left of the price axis. These regions included the portion of the display where the market bid and ask quantities were displayed (the bid and the ask display regions). Hence the bid and ask order entry regions overlapped the respective display regions.	
53	The method of claim 1 wherein the market depth is based on an exchange order book and wherein the static display of prices does not move in response to the addition of a price to the exchange order book, the additional price comprising a displayed price.	The static display of prices in the TSE98 system correspond to prices in an exchange order book. The display of prices only moves when the user depresses the HOME key or the SCROLL keys. It does not move when a price is added to the exchange order book for a displayed price.	
54	The method of claim 53 wherein the static display of prices does not move in response to the removal of a price from the exchange order book, the removed price comprising a displayed price.	The static display of prices in the TSE98 system correspond to prices in an exchange order book. The display of prices only moves when the user depresses the HOME key or the SCROLL keys. It does not move when a price is removed from the exchange order book for a displayed price.	
56	The method of claim 1 wherein the plurality of additional parameters comprises a price and type of order.	The TSE98 system included the price at which the user double-clicked, and the type of order (bid or ask) in the plurality of trade order parameters.	

'304 Patent Claim Chart For TSE

	'304 CLAIM ELEMENT	TSE '98	Other Prior Art
1	A method for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid price and a lowest ask price on a graphical user interface, the method comprising;	TSE98 was an electronic exchange which included a user terminal device for entering trade orders. TSE98 displayed market information including an inside price consisting of a highest bid and a lowest offer. The inside market was displayed on a graphical user interface, and this, in conjunction with an input device consisting of a mouse and keyboard, provided a method for facilitating trading of commodities.	
	dynamically displaying a first indicator in one of a plurality of locations in a bid display region each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the highest bid price currently available in the market;	TSE98 displayed the quantity of the best bid order (the highest bid) to the right of a common static price axis, in the location adjacent to the price of that best bid order. The quantity and its position were dynamically updated if the size or price of the best bid changed in the market. This dynamically updating quantity of the best bid was the "first indicator" of TSE98.	
	dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the common static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;	TSE98 displayed the quantity of the best ask order (the lowest ask) to the left of a common static price axis, in the location adjacent to the price of that best ask order. The quantity and its position were dynamically updated if the size or price of the best ask changed in the market. This dynamically updating quantity of the best ask was the "second indicator" of TSE98.	
	displaying the bid and ask display	When the inside market (best bid and best ask) changed in	

	'304 CLAIM ELEMENT	TSE '98	Other Prior Art
	regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid and ask display regions relative to the common static price axis;	TSE98, the common static price axis did not move if the display was in the "scroll mode". The best bid quantity and/or the best ask quantity moved relative to the static price axis when the inside market changed.	
	displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and	The order entry region of TSE98 consisted of the locations to the left (for entering ask orders) and to the right (for entering bid orders) of the common static price axis. Each location of the bid or ask order entry region corresponded to the price to which it was adjacent.	
	in response to a selection of a particular location of the order entry region by a single action of a user input device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.	By double clicking on a particular area of the bid or ask order entry region (a single action) the TSE98 system would set the instrument, the price, the buy/sell indicator, and the self/consigned indicator for the trade order. This information would appear in the "order window" with the cursor positioned in the SIZE field. The user would enter the size (quantity) of the trade order and press the SEND key to send the order to the electronic exchange.	GLOBEX (1992) order size default Patsystems DOM Screen (Nov. 1998) Midas Kapiti X_Trader 1998 User Documentation Manual Release 3.10 Minex Nov. 1992 Service Outline Amazon 5,960,411 GLTP 4.31
2	The method of claim 1 wherein the bid and ask display region comprises columns with a plurality of cells that are displayed as a grid such that the cells of each column are aligned.	The bid and ask display regions of TSE98 were each a vertical column of cells arranged in a grid with the cells of the bid display region and the cells of the ask display region both aligned with the common price axis and hence aligned with each other.	

	'304 CLAIM ELEMENT	TSE '98	Other Prior Art
3	The method of claim 1 wherein the bid and ask display regions and the order entry region are oriented vertically.	The bid and the ask display regions and the order entry regions of TSE98 were all oriented vertically.	
5	The method of claim 1 wherein one of the plurality of locations of bid display region comprises a blank region in which there is no first indicator displayed.	If there was no bid order in the electronic market at one of the price levels displayed in the common static price axis then that location of the bid display region was blank, if the display was in "non-compressed mode." TSE000714 , page 6-3.	
6	The method of claim 1 wherein one of the plurality of locations of the ask display region comprises a blank region in which there is no first indicator displayed.	If there was no ask order in the electronic market at one of the price levels displayed in the common static price axis then that location of the ask display region was blank, if the display was in "non-compressed mode." TSE000714 , page 6-3.	
7	The method of claim 1 comprising the step of displaying at least a portion of the common static price axis in a price display region.	TSE98 displayed either 20 price levels or 7 price levels depending on the user selected screen configuration. These prices were the portion of the common static price axis which was displayed in the price display region.	
8	The method of claim 7 wherein the bid display region and the ask display region, the order entry region and the price display region comprise columns with a plurality of cells that are displayed as a grid such that the cells of each column are aligned.	In TSE98 the bid display region, the ask display region, the bid order entry region, the ask order entry region (collectively these last two as the order entry region), and the price display region were all columns with multiple cells arranged in a grid fashion with the corresponding cells of all of these columns in alignment.	
9	The method of claim 7 wherein the bid display region, the ask display region, the order entry region and the price display region are oriented vertically.	The bid display region, the ask display region, the order entry region and the price display region were all oriented vertically in TSE98.	
11	The method of claim 1 further comprising the steps of: dynamically displaying a third	TSE98 displayed the quantity of additional bids, at lower prices than the best bid, in the location of the bid display region corresponding to the price of those additional bids.	

	'304 CLAIM ELEMENT	TSE '98	Other Prior Art
	indicator at one of the plurality of locations in the bid display region, the third indicator representing quantity associated with at least one order to buy the commodity at a price different than the highest bid price currently available in the market; and		
	dynamically displaying a fourth indicator at one of the plurality of locations in the ask display region, the fourth indicator representing quantity associated with at least one order to sell the commodity at a price different than the lowest ask price currently available in the market.	TSE98 displayed the quantity of additional asks, at higher prices than the best ask, in the location of the ask display region corresponding to the price of those additional asks.	
12	The method of claim 11 wherein a location of the plurality of locations of the bid display region comprises a blank region in which there is no first or third indicator displayed.	If there was no bid order in the electronic market at one of the price levels displayed in the common static price axis then that location of the bid display region was blank, if the display was in "non-compressed mode." Therefore there was no "first indicator" (quantity of best bid) or "third indicator" (quantity of additional bid) in such location. TSE000714 , page 6-3.	
13	The method of claim 1 wherein a location of the plurality of locations of the ask display region comprises a blank region in which there is no second or fourth indicator displayed.	If there was no ask order in the electronic market at one of the price levels displayed in the common static price axis then that location of the ask display region was blank, if the display was in "non-compressed mode." Therefore there was no "second indicator" (quantity of best ask) or "fourth indicator" (quantity of additional ask) in such location. TSE000714 , page 6-3.	
14	The method of claim 1 wherein the order entry region comprises: a bid order entry region comprising a plurality of locations for receiving commands to send buy orders, each	TSE98 provided a bid order entry region consisting of the cells to the right of the common price axis, each cell corresponding to the price level adjacent to it in the common static price axis. These cells were programmed to receive commands to send buy orders.	

	'304 CLAIM ELEMENT	TSE '98	Other Prior Art
	location corresponding to a price level along the common static price axis; and		
	an ask order entry region comprising a plurality of locations for receiving commands to send sell orders, each location corresponding to a price level along the common static price axis.	TSE98 provided a ask order entry region consisting of the cells to the left of the common price axis, each cell corresponding to the price level adjacent to it in the common static price axis. These cells were programmed to receive commands to send ask orders.	
15	The method of claim 14 wherein the bid order entry region overlaps with the bid display region and the ask order entry region overlaps with the ask display region.	The bid order entry region was contained within the bid display region of TSE98, and hence overlapped the bid display region. The same was true of the ask order entry region and ask display region.	
16	The method of claim 1 further comprising dynamically displaying an entered order indicator in association with the price levels arranged along the common static price axis.		<p>“Trading Room With a View” – PATS PTS Application, TT X-Trader. IPE “Exchanges Put on New Game Faces” – MATIF NFC-VF, OM ORC Trading Application Several prior art references for this capability have been cited in the body of this report.</p>
17	The method of claim 16 wherein the entered order indicator is displayed in an entered order region.		<p>“Trading Room With a View” – PATS PTS Application, TT X-Trader. IPE “Exchanges Put on New</p>

	'304 CLAIM ELEMENT	TSE '98	Other Prior Art
			Game Faces” – MATIF NFC-VF, OM ORC Trading Application Several prior art references for this capability have been cited in the body of this report.
18	The method of claim 1 further comprising dynamically displaying a last trade indicator in association with the common static price axis.	TSE98 indicated the price of the last trade by displaying that price in yellow on the common static price axis. This yellow price was the dynamic last trade indicator. TSE000758, page 7-22.	
19	the method of claim 18 wherein the last trade indicator is displayed in a last trade region.	The common static price axis was the last trade region of TSE98.	
20	The method of claim 1 further comprising the steps of: displaying the first indicator at a first location associated with a first price level on the common static price axis at a first time; and	TSE98 displayed the quantity of the best bid in the location of the bid display region associated with the price of the best bid, as indicated on the adjacent location of the common static price axis.	
	displaying the first indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.	When the price of the best bid changed, TSE98 would display the quantity of the new best bid in its proper location adjacent to the price of that new best bid, and remove the quantity previously shown for the earlier best bid.	
21	The method of claim 1 further comprising the steps of: displaying the second indicator at a first location associated with a first price level on the common static price axis at a first time; and	TSE98 displayed the quantity of the best ask in the location of the ask display region associated with the price of the best ask, as indicated on the adjacent location of the common static price axis.	
	displaying the second indicator at a second location associated with a	When the price of the best ask changed, TSE98 would display the quantity of the new best ask in its proper location adjacent	

	'304 CLAIM ELEMENT	TSE '98	Other Prior Art
	different price level on the common static price axis at a second time subsequent to the first time.	to the price of that new best ask, and remove the quantity previously shown for the earlier best ask.	
22	The method of claim 1 further comprising the steps of : displaying the first indicator at a first location associated with a particular price level on the common static price axis; and repositioning the common static price axis such that the first indicator is displayed at a second location associated with a particular price level on the common static price axis.	When the user depressed the Scroll UP or Scroll DOWN buttons, TSE98 would reposition the common static price axis by shifting the range of prices on display. When this occurred the "first indicator" (the best bid quantity) would move up or down to remain in its correct position relative to the price of that best bid, and hence was displayed at a second location.	
23	The method of claim 1 further comprising the steps of: displaying the second indicator at a first location associated with a particular price level on the common static price axis; and repositioning the common static price axis such that the second indicator is displayed at a second location associated with the particular price level on the common static price axis.	When the user depressed the Scroll UP or Scroll DOWN buttons, TSE98 would reposition the common static price axis by shifting the range of prices on display. When this occurred the "second indicator" (the best ask quantity) would move up or down to remain in its correct position relative to the price of that best ask, and hence was displayed at a second location.	
24	The method of claim 1 wherein the bid and ask display regions are displayed in different colors.		The motivation and method for providing color differentiation in user interfaces was well known to persons with ordinary skill in the art. Several prior art references for this capability have been

	'304 CLAIM ELEMENT	TSE '98	Other Prior Art
			cited in the body of this report.
25	The method of claim 1 wherein the first and second indicators are displayed in different colors.		The motivation and method for providing color differentiation in user interfaces was well known to persons with ordinary skill in the art. Several prior art references for this capability have been cited in the body of this report.
26	The method of claim 1 wherein the bid and ask display regions are displayed in a window further comprising centering the display of the first and second indicators in the window upon receipt of a centering instruction.	TSE98 responded to the HOME key by re-centering the display so that the best bid, best ask, and last price were near the center of the price display.	
27	A computer readable medium having program code recorded thereon for execution on a computer for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid price and a lowest ask price on a graphical user interface, the program code causing a machine to perform the following method steps:	TSE98 was implemented in a computer programming language which was translated into program codes stored on a computer readable medium. These codes implemented an electronic exchange which included a user terminal device for entering trade orders. The codes of TSE98 displayed market information including an inside price consisting of a highest bid and a lowest offer. The inside market was displayed on a graphical user interface, and this, in conjunction with an input device consisting of a mouse and keyboard, provided a method for facilitating trading of commodities.	
	dynamically displaying a first	The codes of TSE98 displayed the quantity of the best bid	

	'304 CLAIM ELEMENT	TSE '98	Other Prior Art
	indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the highest bid price currently available on the market;	order (the highest bid) to the right of a common static price axis, in the location adjacent to the price of that best bid order. The quantity and its position were dynamically updated if the size or price of the best bid changed in the market. This dynamically updating quantity of the best bid was the “first indicator” of TSE98.	
	dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the common static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;	The codes of TSE98 displayed the quantity of the best ask order (the lowest ask) to the left of a common static price axis, in the location adjacent to the price of that best ask order. The quantity and its position were dynamically updated if the size or price of the best ask changed in the market. This dynamically updating quantity of the best ask was the “second indicator” of TSE98.	
	displaying the bid and ask display regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid and ask display regions relative to the common static price axis;	When the inside market (best bid and best ask) changed in TSE98, the common static price axis did not move if the display was in the “scroll mode”. The best bid quantity and/or the best ask quantity moved relative to the static price axis when the inside market changed.	
	displaying an order entry region comprising a plurality of locations	The order entry region of TSE98 consisted of the locations to the left (for entering ask orders) and to the right (for entering	

	'304 CLAIM ELEMENT	TSE '98	Other Prior Art
	for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and	bid orders) of the common static price axis. Each location of the bid or ask order entry region corresponded to the price to which it was adjacent.	
	in response to a selection of a particular location of the order entry region by a single action of a user input device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.	By double clicking on a particular area of the bid or ask order entry region (a single action) the TSE98 system would set the instrument, the price, the buy/sell indicator, and the self/consigned indicator for the trade order. This information would appear in the "order window" with the cursor positioned in the SIZE field. The user would enter the size (quantity) of the trade order and press the SEND key to send the order to the electronic exchange.	GLOBEX (1992) order size default Patsystems DOM Screen (Nov. 1998) Midas Kapiti X_Trader 1998 User Documentation Manual Release 3.10 Minex Nov. 1992 Service Outline Amazon 5,960,411 GLTP 4.31
28	The method of claim 11 wherein the first and third indicators are displayed in locations of the bid display region that are arranged along an axis which is parallel to the common static price axis.	The bid display region and the ask display region of TSE98 were both in vertical columns parallel to the vertical common static price axis. The first and the third indicators were displayed in the bid display region.	
29	The method of claim 11 wherein the second and fourth indicators are displayed in locations of the ask display region that are arranged along an axis which is parallel to the common static price axis.	The bid display region and the ask display region of TSE98 were both in vertical columns parallel to the vertical common static price axis. The second and the fourth indicators were displayed in the ask display region.	
30	The method of claim 11 comprising the steps of displaying the first indicator at a first location associated with a first price level on the common static price axis at a	TSE98 displayed the quantity of the best bid in the location of the bid display region associated with the price of the best bid, as indicated on the adjacent location of the common static price axis. When the price of the best bid changed, TSE98 would display the quantity of the new best bid in its proper	

	'304 CLAIM ELEMENT	TSE '98	Other Prior Art
	first time; and displaying the first indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.	location adjacent to the price of that new best bid, and remove the quantity previously shown for the earlier best bid. Thus the "first indicator" was displayed at a second location and at a different price level at the subsequent time.	
32	The method of claim 31 wherein each location of the bid display region corresponds to a different price level along the common static price axis and each location of the ask display region corresponds to a different price level along the common static price axis.	The locations of the bid display region and the ask display region each corresponded to the price adjacent to the display location of the common static price axis. Thus each location of the bid display region corresponded to a different price, and same for the ask display region.	
33	The method of claim 11 comprising the steps of: displaying the second indicator at a first location associated with a first price level on the common static price axis at a first time; and displaying the second indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.	TSE98 displayed the quantity of the best ask in the location of the ask display region associated with the price of the best ask, as indicated on the adjacent location of the common static price axis. When the price of the best ask changed, TSE98 would display the quantity of the new best ask in its proper location adjacent to the price of that new best ask, and remove the quantity previously shown for the earlier best ask. Thus the "second indicator" was displayed at a second location and at a different price level at the subsequent time.	
34	The method of claim 33 wherein the third and fourth indicators remain in the same location in the bid and ask display regions, respectively, before and after the second indicator is displayed at the second location.	If the best ask changes its price, but the additional bids and asks do not change, then TSE98 would display the new best ask in its correct position in the ask display region (a second location) while the location of the additional bids and asks remain unchanged in their original locations.	
35	The method of claim 34 wherein each location of the display region corresponds to a different price	The locations of the bid and the ask display regions each correspond to their adjacent price in the common static price axis. Hence, each such location corresponds to a different	

	'304 CLAIM ELEMENT	TSE '98	Other Prior Art
	level along the common static price axis and each location of the ask display region corresponds to a different price level along the common static price axis.	price level.	
36	The method of claim 1 wherein the bid and ask display regions are displayed separately.	The bid display region of TSE98 is displayed to the right of the common static price axis, and the ask display region is displayed to the left of the common static price axis, and hence they are displayed separately.	
37	The method of claim 1 wherein the first and second indicators are based on an exchange order book and wherein the price levels along the common static price axis do not move in response to the addition of a price to the exchange order book, the additional price comprising a price for where there is a corresponding displayed location in at least one of the bid and ask display regions.	The quantities displayed in the bid and the ask display region of TSE98 correspond to orders in an exchange order book. When a new order enters the order book, at a price that is on display in the common static price axis, the quantity associated with that price is displayed in the bid or the ask display region, and the price levels of the static price axis do not move.	