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Attorney Docket No. 02-211-Z6
First Named Inventor Brumfield
Express Mail No. EV839378594US

APPLICATION ELEMENTS

ACCOMPANYING APPLICATION PARTS

- 1. Transmittal Form
- 2. Specification (including claims and abstract) [Total Pages 64]
- 3. Drawings [Total Sheets 34]
- 4. Oath or Declaration [Total Pages 2]
 - a. Newly executed
 - b. Copy from prior application (for continuation/divisional with Box 18 completed)
 - i. Deletion of Inventor(s) Signed statement attached deleting inventor(s) named in the prior application
- 5. Application Data Sheet (See 37 CFR 1.76)
- 6. Computer Code Listing (See 1.96)
 - a. Microfiche Appendix
 - b. CD-ROM or CD-R (in duplicate, with separate transmittal)
- 7. Nucleotide and/or Amino Acid Sequence Submission
 - a. Computer Readable Copy
 - b. Paper Copy
 - c. Statement verifying above copies
- 8. Applicant Claims Small Entity Status See 37 CFR 1.27.

- 9. Assignment Papers
- 10. Power of Attorney
- 11. English Translation Document (if applicable)
- 12. Information Disclosure Statement (IDS)
 - PTO-1449 Form
 - Copies of IDS Citations
- 13. Preliminary Amendment
- 14. Return Receipt Postcard (Should be specifically itemized)
- 15. Certified Copy of Priority Document(s)
- 16. A Request for non-publication pursuant to 35 U.S.C. § 122(b)(2)(B)(i)
- 17. Other:

18. This is a CONTINUING APPLICATION. Please note the following:

- a. This is a Continuation Divisional Continuation-in-part of prior U.S. Patent Application Serial No. 10/403,881 filed March 31, 2003 which is a continuation of 10/125,894 filed April 19, 2002 which is a continuation-in-part of serial no. 09/971,087 filed October 5, 2001, which claims benefit to provisional application no. 60/238,001 filed October 6, 2000 and is a continuation-in-part of application serial no. 09/590,692 filed June 9, 2000 and application serial no. 09/589,751 filed June 9, 2000 which claims the benefit of provisional application no. 60/186,322 filed March 2, 2000 which claims the benefit of provisional no. 60/325,553 filed on October 1, 2001.
- b. Amend the specification by inserting before the first line the sentence:
This is a continuation divisional continuation-in-part of application Serial No. Serial No. 10/403,881 filed March 31, 2003 which is a continuation of 10/125,894 filed April 19, 2002 which is a continuation-in-part of serial no. 09/971,087 filed October 5, 2001, which claims benefit to provisional application no. 60/238,001 filed October 6, 2000 and is a continuation-in-part of application serial no. 09/590,692 filed June 9, 2000 and application serial no. 09/589,751 filed June 9, 2000 which claims the benefit of provisional application no. 60/186,322 filed March 2, 2000 which claims the benefit of provisional no. 60/325,553 filed on October 1, 2001.
- c. The prior application is assigned of record to Trading Technologies International, Inc.
For CONTINUATION or DIVISIONAL Apps only: The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein. This incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application papers.

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APPLICATION FEES

BASIC UTILITY FILING FEE				\$ 300.00
SEARCH FEE				\$ 500.00
EXAMINATION FEE				\$ 200.00
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total Claims	35 -20 =	0	x \$50.00	\$
Independent Claims	4- 3 =	0	x \$200.00	\$
<input type="checkbox"/> Multiple Dependent Claims(s) if applicable			+ \$360.00	\$
APPLICATION SIZE*	EXTRA SHEETS	NO. OF EACH ADD'L 50	RATE	
Total Sheets	- 100 =	/50 = (round up to whole number)	x \$250.00	\$
Total of above calculations =				\$
Reduction by 50% for filing by small entity =				\$(
<input type="checkbox"/> Assignment fee if applicable			+ \$40.00	\$
<input type="checkbox"/> Non-English Specification (no small entity discount)			+ \$130.00	\$
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19. Please charge my Deposit Account No. 13-2490 in the amount of \$
20. A check in the amount of \$ _____ is enclosed.
21. The Commissioner is hereby authorized to credit overpayments or charge any additional fees of the following types to Deposit Account No. 13-2490:
- a. Fees required under 37 CFR 1.16.
 - b. Fees required under 37 CFR 1.17.
 - c. Fees required under 37 CFR 1.18.
22. The Commissioner is hereby generally authorized under 37 CFR 1.136(a)(3) to treat any future reply in this or any related application filed pursuant to 37 CFR 1.53 requiring an extension of time as incorporating a request therefor, and the Commissioner is hereby specifically authorized to charge Deposit Account No. 13-2490 for any fee that may be due in connection with such a request for an extension of time.

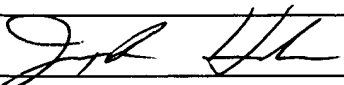
23. CERTIFICATE OF MAILING

I hereby certify that, under 37 CFR § 1.10, I directed that the correspondence identified above be deposited with the United States Postal Service as "Express Mail Post Office to Addressee," addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on the date indicated below.

24. USPTO CUSTOMER NUMBER

39310
Trading Technologies International, Inc.

25. SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Name	Joseph A. Herndon
Reg. No.	50,469
Signature	
Date	May 3, 2006

* If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250.00 (\$125.00 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

**APPLICATION FOR A UNITED STATES PATENT
UNITED STATES PATENT AND TRADEMARK OFFICE**

(Attorney Docket No. 02-211-B)

TITLE: **System and Method for Automatic Repositioning of
Market Information in a Graphical User Interface**

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SYSTEM AND METHOD FOR AUTOMATIC REPOSITIONING OF MARKET INFORMATION IN A GRAPHICAL USER INTERFACE

[0001] This application is a continuation of U.S. Patent Application No. 10/125,894, "Trading Tools for Electronic Trading," filed April 19, 2002, which is a continuation-in-part of U.S. Patent Application No. 09/971,087, filed October 5, 2001, which claims the benefit of U.S. Provisional Application No. 60/238,001, filed October 6, 2000. U.S. Patent Application No. 10/125,894 is also a continuation-in-part of U.S. Patent Application No. 09/590,692, filed June 9, 2000 and U.S. Patent Application No. 09/589,751, filed June 9, 2000, both of which claim the benefit of U.S. Provisional Application No. 60/186,322, filed March 2, 2000. U.S. Patent Application No. 10/125,894 also claims the benefit of U.S. Patent Application No. 60/325,553, filed October 1, 2001. The entire content of each of the above-referenced applications is incorporated herein by reference.

FIELD OF INVENTION

[0002] The present invention is directed to electronic trading. Specifically, the present invention is directed to tools for trading products that can be traded with quantities and/or prices.

BACKGROUND

[0003] Many exchanges throughout the world utilize electronic trading in varying degrees to trade stocks, bonds, futures, options and other products. These electronic exchanges are based on three components: mainframe computers (host), communications servers, and the exchange participants' computers (client). The host forms the electronic heart of the fully computerized electronic trading system. The system's operations cover order-matching, maintaining order books and positions, price information, and managing and updating the database for the online trading day as well as nightly batch runs. The host is also equipped with external interfaces that maintain uninterrupted online contact to quote vendors and other price information systems.

[0004] Traders can link to the host through at least three types of structures: high speed data lines, high speed communications servers or the Internet. High speed data lines establish direct connections between the client and the host. Another connection can be established by configuring high speed networks or communications servers at strategic access points worldwide in locations where traders physically are located. Data is transmitted in both directions between traders and exchanges via dedicated high speed communication lines. Most exchange participants install two lines between the exchange and the client site or between the communication server and the client site as a safety measure against potential failures. An exchange's internal computer system is also often installed with backups as a redundant measure to secure system availability. The third connection utilizes the Internet. Here, the exchange and the traders communicate back and forth through high speed data lines, which are connected to the Internet. This allows traders to be located anywhere they can establish a connection to the Internet.

[0005] Irrespective of the way in which a connection is established, the exchange participants' computers allow traders to participate in the market. They use software that creates specialized interactive trading screens on the traders' desktops. The trading screens enable traders to enter and execute orders, obtain market quotes, and monitor positions. The range and quality of features available to traders on their screens varies according to the specific software application being run. The installation of open interfaces in the development of an exchange's electronic strategy means users can choose, depending on their trading style and internal requirements, the means by which they will access the exchange.

[0006] The world's stock, bond, futures, options and other exchanges have volatile products with prices that move rapidly. To profit in these markets, traders must be able to react quickly. A skilled trader with the quickest software, the fastest communications, and the most sophisticated analysis can significantly improve the trader's own or the trader's firm's bottom line. The slightest speed advantage can generate significant returns in a fast moving market. In today's

securities markets, a trader lacking a technologically advanced interface is at a severe competitive disadvantage.

[0007] Irrespective of what interface a trader uses to enter orders in the market, each market supplies to and requires from every trader the same information. The bids and asks in the market make up the market data and everyone logged on to trade can receive this information if the exchange provides it. Similarly, every exchange requires that certain information be included in each order. For example, traders must supply information like the name of the commodity, quantity, restrictions, price and multiple other variables. Without all of the order information, the market will not accept the order.

[0008] 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. Such elements include the commodity symbol, the desired price, the quantity and whether a buy or a sell order is desired. The more time a trader takes entering an order, the more likely the price on which the trader wanted to bid or offer will change or not be available in the market. The market is fluid as many traders are sending orders to the market 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 the trader could enter the order, the trader may lose hundreds, thousands, even millions of dollars. The faster a trader can trade, the less likely it will be that the trader will miss the trader's price and the more likely the trader will make money.

[0009] With the advent of electronic trading, it has become easier for a larger number of people to have access to participate in the market at any given time. Such an increase in the number of potential traders has led to other changes, including a more competitive market, greater liquidity, rapidly changing prices, and other changes. Due to the complexities that these changes bring, it is

increasingly important to have a system of making the most accurate and calculated trades possible in the most efficient manner. It is therefore desirable for electronic trading systems to offer tools that can assist a trader in adapting to an electronic marketplace, and help the trader to make trades at desirable prices.

SUMMARY

[0010] The preferred embodiments relate to a system and method for automatic repositioning of market information in a graphical user interface.

[0011] In accordance with a first aspect, a method for automatically positioning information related to a commodity on a graphical user interface is provided. The method includes receiving market information relating to the commodity from an electronic exchange. The market information may include a number of items of interest that are associated with a price. The method displays an information display region, which has a number of locations arranged such that each location corresponds to a price level along at least a portion of a static price axis. The method also displays a number of indicators, at a first time. Each indicator is associated with an item of interest and each indicator is displayed in one of the locations in the information display region. The method further includes automatically repositioning the static price axis upon detecting a predetermined condition so that the number of locations of the information display region corresponds to a different portion of the static price axis at a second time. In this manner, the indicators are moved to a new location in the information display region that corresponds to the price level on the static price axis that is associated with that indicator.

[0012] In accordance with a second aspect, a method for automatically repositioning market information relating to a commodity on a graphical user interface is provided, where the method includes displaying a plurality of items of interest comprising market information in relation to a static scale in a trading interface. At least one item of interest from the plurality of items of interest is identified as a basis for automatically positioning the plurality of items of interest. The display on the trading interface is updated as the market information changes, causing one or more of the plurality of items of interest to move in relation to the static scale. The method then automatically re-positions the plurality of items of interest in response to the identified item of interest.

BRIEF DESCRIPTION OF THE DRAWINGS

- [0013] FIG. 1 illustrates the network connections between multiple exchanges and client sites;
- [0014] FIG. 2 illustrates screen display showing the inside market and the market depth of a given commodity being traded;
- [0015] FIG. 3 illustrates an alternative display, having bid and ask quantities displayed in association with a static price scale, that may be used in accordance with preferred embodiments;
- [0016] FIG. 4 illustrates the display at a later time showing the movement of values when compared to FIG. 3;
- [0017] FIG. 5 illustrates a display with parameters set in order to exemplify the trading method;
- [0018] FIG. 6 is a flowchart illustrating one process for display and trading using the displays of FIGs. 3 through 5;
- [0019] FIG. 7 illustrates a Last Traded Quantity marker in accordance with a preferred embodiment, and further illustrates color coding of the Last Traded Quantity;
- [0020] FIG. 8 is a diagram showing the transfer of multiple data feeds between an exchange and a client;
- [0021] FIG. 9 is a diagram showing a disruption in one of the data feeds shown in FIG. 8;
- [0022] FIG. 10 illustrates a display showing the aggregated working quantities in a market for a user's buy and sell orders;
- [0023] FIGs. 11A and 11B are displays showing a dynamic indicator;
- [0024] FIGs. 12A and 12B are displays showing "arrow" cells that may be used to view items of interest outside the current display;

[0025] FIGs. 13A and 13B are displays showing examples of thermometer indicators to illustrate the quantity of buy and sell interest in a market;

[0026] FIGs. 14A and 14B are displays illustrating auto scalper indicators;

[0027] FIGs. 15A and 15B are a display showing an embodiment in which a user may select the price level reasonability check feature through a dialog box, and a display showing a measure of reasonability in relation to the Last Traded Price, respectively;

[0028] FIG. 16A is a display showing the display of the last traded price and inside market for use with the automatic grid centering feature of a preferred embodiment; and FIG. 16B is a display showing how a user may select and manipulate the automatic grid positioning feature;

[0029] FIG. 17 is a display showing a user's current working sell quantities and working buy quantities and additional criteria used for implementing the "drag and drop" feature of a preferred embodiment;

[0030] FIG. 18 is a display showing the working quantities of a user in addition to the user's average working buy price and average working sell price;

[0031] FIGs. 19A and 19B are displays showing the function of the highlight midpoint re-centering feature of a preferred embodiment; FIG. 19C is a sample GUI options dialog box in which the highlight midpoint re-centering feature can be activated according to one embodiment of the present invention;

[0032] FIG. 20A is a display showing how blank spots are color-coded according to one embodiment; FIG. 20B is a display of a sample GUI options dialog box in which a user can activate the color coding feature of FIG. 20A;

[0033] FIG. 21 is a display showing how the average price of a trader's open position is indicated according to one embodiment of the invention; and

[0034] FIG. 22 is a display showing one embodiment of a consolidation control icon in accordance with a preferred embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0035] As described with reference to the accompanying figures, trading tools in accordance with various preferred embodiments are provided to, among other things, facilitate fast and accurate order entry. Certain of the trading tools work particularly well with a trading display that shows working orders and/or bid and ask quantities, or other market information, displayed in association with a static price scale or axis. An example of such a trading display is illustrated in Figures 3 through 5. It is to be understood that, in this context, static does not mean immovable, but rather means fixed in relation. For example, with a static price scale, the scale itself may be movable, but the prices represented remain fixed in relation to each other, subject to consolidation or expansion as described below. Trading applications that generate different trading displays may alternatively be used.

[0036] In a preferred embodiment, one or more of the trading tools described herein is implemented on a computer or electronic terminal. The computer is able to communicate either directly or indirectly (using intermediate devices) with one or more exchanges to receive and transmit market, commodity, and trading order information. The computer or terminal is able to interact with the trader and to generate contents and characteristics of a trade order to be sent to the exchange. A trading application allows for a trader to view market data, enter and cancel trade orders and/or view orders. The scope of the present invention is not limited by the type of terminal or device used, and is not limited to any particular type of trading application. Rather, the trading tools may be implemented on any existing or future terminal or device with the processing capability to perform the functions described herein.

[0037] As used herein, the word "commodity" refers simply to a thing that is an object of trade. It includes anything that can be traded with a quantity and/or price. Examples of such objects include, but are not limited to, all types of traded financial products, such as, for example, stocks, options, bonds, futures, currency, and warrants, as well as funds, derivatives and collections or combinations of the foregoing. The commodity may be "real," such as objects that are listed by an

exchange for trading, or “synthetic,” such as a combination of real commodities that is created by the user.

[0038] Further, the specification may refer to a single click of a mouse as an example of a single action of the user for input and interaction with the terminal display. In order to allow actions to be taken in the shortest amount of time, a preferred embodiment of the trading application responds upon depressing the mouse button, rather than waiting for the up click. While this may describe a preferred mode of interaction, the scope of the present invention is not limited to the use of a mouse as the input device or to the click of a mouse button as the user’s single action. Rather, any action by a user, whether comprising one or more clicks of a mouse button or other input device, such as a keyboard, joystick or touch screen, may be considered the single action of the user.

[0039] An electronic trading system may be configured to allow for trading in a single or in multiple exchanges simultaneously. Connections for an example of such a system are illustrated in FIG. 1. This illustration shows multiple host exchanges 101-103 connected through routers 104-106 to gateways 107-109. Multiple client terminals 110-116 for use as trading stations can then trade in the multiple exchanges through their connection to the gateways 107-109. It should be noted that the trading tools of the preferred embodiment are not limited to any particular network architecture, but rather may be applied with utility on workstations or other client devices in any network that can be used for electronic trading.

[0040] When an electronic trading system is configured to receive data from multiple exchanges, it is preferable to translate the data from each exchange into a format that may be displayed using a graphical user interface. For the example shown in FIG. 1, an application program interface (“TT API” as depicted in the FIG. 1) translates the incoming data formats from the different exchanges to a common data format. This translation function of a preferred embodiment may be disposed anywhere in the network, for example, at the gateway server, at the individual workstations or at both. In addition, storage elements at the gateway servers, the client workstations, and/or other external storage may cache, buffer,

or store historical data, such as order books that list the user's active orders in the market; that is, those orders that have neither been filled nor cancelled.

Information from different exchanges can be displayed in one or in multiple windows at the client workstation. Accordingly, while reference is made through the remainder of the specification to a single exchange to which a trading terminal is connected, the scope of the invention includes the ability to trade, in accordance with the trading methods described herein, in multiple exchanges using a single trading terminal.

[0041] A commercially available trading application that allows a user to trade in a system like that shown in FIG. 1 is X_TRADER[®] from Trading Technologies International, Inc. of Chicago, Illinois. X_TRADER[®] also provides an electronic trading interface, referred to as MD_TRADER[™], in which working orders and/or bid and ask quantities are displayed in association with a static price scale. The preferred embodiments, however, are not limited to any particular product that performs the translation, storage and/or display functions.

[0042] Several preferred embodiments include the display of "market depth" and/or allow a user to view the market depth of a commodity and to enter orders with a single input, such as the click of a computer mouse button. As used herein, market depth is represented by the available order book, including the current bid and ask quantities and their associated prices. In other words, subject to the limits noted below, market depth is each available pending bid and ask quantity, entered at a particular price, in addition to the "inside market." For a commodity being traded, the inside market is the highest bid price and the lowest ask price. For embodiments relating to a display that includes market depth, interfaces as shown in Figures 2 and 3 are exemplary. Other trading applications that are capable of displaying market depth are suitable alternatives, unless otherwise noted. Furthermore, the preferred embodiments are not limited to an electronic trading application that displays market depth, but can be utilized with any electronic trading application.

[0043] Generally, the exchanges send price, order and fill information to the gateways 107-109. The trading application, for example X_TRADER[®],

processes this information and maps it to positions in a theoretical grid program or any other comparable mapping technique for mapping data to a screen. The physical mapping of such information to a screen grid, for display on a client device like the client devices 110-116, may be done by any technique known to those skilled in the art. The present invention is not limited by the method used to map the data to the screen display.

[0044] The system's ability to fully display the market depth typically depends on how much of the market depth the exchange provides. Some exchanges, for example, supply an infinite market depth, while others provide no market depth or only a few orders away from the inside market. The user can preferably also choose how far into the market depth to display on the trader's screen. For example, the user may only want to have displayed the market depth within a predetermined number of ticks away from the inside market.

[0045] FIG. 2 illustrates an electronic trading interface described in a co-pending U.S. Patent Application No. 09/589,751, incorporated above. This display and system is just one example of a type of trading system that may incorporate one or more aspects of the present invention. The display shows the inside market and the market depth of a given commodity being traded. Row 1 represents the "inside market" for the commodity being traded which is the best (highest) bid price and quantity and the best (lowest) ask price and quantity. Rows 2-5 represent the "market depth" for the commodity being traded. In one preferred embodiment, the display of market depth (rows 2-5) lists the available next-best bids, in column 203, and asks, in column 204. The working bid and ask quantity for each price level is also displayed in columns 202 and 205 respectively (inside market - row 1). Prices and quantities for the inside market and market depth update dynamically on a real time basis as such information is relayed from the market.

[0046] In the screen display shown in FIG. 2, the commodity (contract) being traded is represented in row 1 by the character string "CDH0". The Depth column 201 will inform the trader of a status by displaying different colors. Yellow indicates that the program application is waiting for data. Red indicates

that the Market Depth has failed to receive the data from the server and has "timed out." Green indicates that the data has just been updated. The other column headings in this and all of the other figures, are defined as follows. *BidQty (Bid Quantity)* at column 202: the quantity for each working bid; *BidPrc (Bid Price)* at column 203: the price for each working bid; *AskPrc (Ask Price)* at column 204: the price for each working ask; *AskQty (Ask Quantity)* at column 205: the quantity for each working ask; *LastPrc (Last Price)* at column 206: the price for the last bid and ask that were matched in the market; and *LastQty (Last Quantity)* at column 207: the quantity traded at the last price. *Total* at column 208 represents the total quantity traded of the given commodity.

[0047] The configuration of the screen display itself informs the user in a more convenient and efficient manner than many existing systems. Traders gain an advantage by seeing the market depth because they can see trends in the orders in the market. The market depth display shows the trader the interest the market has in a given commodity at different price levels.

[0048] Another type of display system and related trading method which may be used in conjunction with the preferred embodiments is described in detail in U.S. Application No. 09/590,692, filed on June 9, 2000. This method ensures fast and accurate execution of trades by displaying information, such as market depth or working orders, in association with an axis or scale of static prices. One embodiment using this type of display system displays the market depth on a vertical plane, which fluctuates logically up or down the plane as the market prices fluctuates. The invention is not limited to any particular display – the information could be displayed on a horizontal plane, n-dimensionally or in any other fashion. This allows the trader to trade quickly and efficiently. An example of such a display is illustrated in the screen display of FIG. 3.

[0049] In a fast moving market, where varying price levels are trading (i.e. bids and offers entering the market are being matched at different prices), it is beneficial that the trader be able to quickly enter orders and quickly see and analyze market information. Displays of the type illustrated in FIG. 3 allow the trader to quickly enter orders at specific price levels by clicking next to a static

price level, displayed as a static column in a preferred embodiment and to quickly and easily see information such as working orders. The static prices can be displayed in any matter, including in a row, on any angle, or n-dimensionally, without departing from the invention. It also is possible for the static price values to not be displayed, instead displaying just the market depth levels, working orders, or other information relative to one another along a scale or axis representing particular prices using particular colors or using other methods.

[0050] The display shown in FIG. 3 provides an order entry system, market grid, fill window and summary of market orders in one simple window. Such a condensed display simplifies the trading system by entering and tracking trades in an efficient manner. This system displays market depth in a logical, vertical fashion or horizontally or at some other convenient angle or configuration. A vertical field is shown in the figures and described for convenience, but the field could be horizontal or at an angle or n-dimensionally. The system further increases the speed of trading and the likelihood of entering orders at desired prices with desired quantities. In the preferred embodiment of the invention, the display is a static vertical column of prices with the bid and ask quantities displayed in vertical columns to the side of the price column and aligned with the corresponding bid and ask prices.

[0051] Bid quantities are in column 300 labeled BidQ and ask quantities are in column 302 labeled AskQ. The representative prices for the given commodity are shown in column 304, where the prices are static and increment in "ticks," where a tick is the minimum change in a price value that is set by the exchange for each commodity. The prices can be displayed as ticks, as multiples of ticks or in any other fashion. In the embodiment shown in FIG. 3, the column does not list the whole prices (e.g. 95.89), but rather, just the last two digits (e.g. 89). Other price display conventions may alternatively be used, as long as the requisite price information is conveyed to the user. In the example shown, the inside market, cells 306, is 18 (best bid quantity) at 89 (best-bid price) and 20 (best ask quantity) at 90 (best ask price). In the preferred embodiment of the invention, these three columns 300, 302, and 304 are shown in different colors so that the trader can quickly distinguish among them.

[0052] The values in the price column are static; that is, they do not normally change positions unless a re-centering command is received (discussed in detail later). The values in the Bid and Ask columns 300 and 302, however, are dynamic; that is, they move up and down (in the vertical example) to reflect the market depth for the given commodity. The LTQ column 308 shows the last traded quantity of the commodity. The relative position of the quantity value with respect to the Price values reflects the price at which that quantity was traded. Column 310 labeled E/W (Executed/Working) displays the current status of the trader's orders. The status of each order is displayed in the price row where it was entered. For example, in cells 312, the number next to S indicates the number of the trader's ordered lots that have been sold at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled – i.e. the system is working on filling the order. Blanks in this column indicate that no orders are entered or working at that price. In cells 314, the number next to B indicates the number of the trader's ordered lots that have been bought at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled – i.e. the system is working on filling the order.

[0053] Various parameters are set and information is provided in column 316. For example, "10:48:44" in cell 318 shows the actual time of day. The L and R fields in cell 320 indicate a quantity value, which may be added to the order quantity entered. This process is explained below with respect to trading under this system. Below the L and R fields, in cell 322, a number appears which represents the current market volume. This is the number of lots that have been traded for the chosen commodity. Cell 324, "X 10", displays the Net Quantity, the current position of the trader on the chosen commodity. The number "10" represents the trader's buys minus sells. Cell 326 is the "Current Quantity"; this field represents the quantity for the next order that the trader will send to market. This can be adjusted with right and left clicks (up and down) or by clicking the buttons which appear below the Current Quantity in cells 328. These buttons increase the current quantity by the indicated amount; for example, "10" will

increase it by 10; "1H" will increase it by 100; "1K" will increase it by 1000. Cell 330 is the Clear button; clicking this button will clear the Current Quantity field. Cell 332 is the Quantity Description; this is a pull-down menu allowing the trader to choose from three Quantity Descriptions. In one embodiment, the pull-down menu is displayed when the arrow button in the window is clicked. The window includes NetPos, Offset and a field allowing the trader to enter numbers. Placing a number in this field will set a default buy or sell quantity. Choosing "Offset" in this field will enable the L/R buttons of cell 320. Choosing "NetPos" in this field will set the current Net Quantity (trader's net position) as the trader's quantity for his next trade. Cell 334 are +/- buttons; these buttons will alter the size of the screen – either larger (+) or smaller (-). Cell 336 is used to invoke Net 0; clicking this button will reset the Net Quantity (cell 332) to zero. Cell 338 is used to invoke Net Real; clicking this button will reset the Net Quantity (cell 322) to its actual position. It is to be understood that the preferred embodiments are not limited to a trading application that displays these particular buttons. Preferably, the buttons displayed and any parameter, such as quantity, that is set by those buttons are customizable or selectable by the user.

[0054] The inside market and market depth ascend and descend as prices in the market increase and decrease. For example, FIG. 4 shows a screen displaying the same market as that of FIG. 3, but at a later interval where the inside market, cells 400, has risen three ticks. Here, the inside market for the commodity is 43 (best bid quantity) at 92 (best bid price) and 63 (best ask quantity) at 93 (best ask price). In comparing Figures 3 and 4, it can be seen that the price column remained static, but the corresponding bids and asks rose up the price column.

[0055] As the market ascends or descends the price column, the inside market, working orders, last traded price and/or quantity, or any other item that may be of interest 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 addresses this problem with a positioning feature. With a single click at any point within the gray area, 342 in FIG. 3, below the "Net Real" button, the system will re-position the inside market on the trader's screen. As an alternative, this positioning feature may be programmed to be triggered by

clicking in any area of the display. Also, when using a three-button mouse, a click of the middle mouse button, irrespective of the location of the mouse pointer, will re-position the inside market on the trader's screen. As noted above, the display alternatively may be re-positioned based on other items of interest beside the inside market.

[0056] The same information and features can be displayed and enabled in a horizontal or other fashion. Just as the market ascends and descends the vertical scale in this preferred embodiment, shown in Figures 3 and 4, the market will move left and right in the horizontal display. The same data and the same information gleaned from the dynamic display of the data is provided. It is envisioned that other orientations can be used to dynamically display the data and such orientations are intended to come within the scope of the present invention.

[0057] The specific features of the embodiment of a display as shown in Figures 3 and 4 are exemplary of one embodiment of a screen display that can be used with the present invention. The present invention is in no way limited, however, to a screen display that utilizes each of these features.

[0058] **Placing Trade Orders**

[0059] Next, trading commodities, and specifically, the placement of trade orders using a representative display of the type shown in FIG. 3 is described. Using the display and trading method, a trader would first designate the desired commodity and, if applicable, the default quantities. The trader can then trade by positioning an icon and indicating an action, for example with a click of the right or left mouse button. The term "click" may refer to a "half-click" or button down event for any action depending upon the user's and/or system designer's requirements or preferences.

[0060] The following equations are used by this exemplary system to generate trade orders and to determine the quantity and price to be associated with the trade order. The following abbreviations are used in these formulas: P = Price value of row clicked (in ticks), R = Value in R field, L = Value in L field, Q = Current Quantity, Q_a = Total of all quantities in AskQ column at an equal or

better price than P, Q_b = Total of all quantities in BidQ column at an equal or better price than P, N = Current Net Position, Bo = Buy order sent to market and So = Sell order sent to market.

[0061] Any order entered using right mouse button

$Bo = (Q_a + R)P$ (Eq. 1) If BidQ field clicked.

$So = (Q_b + R)P$ (Eq. 2) If AskQ field clicked.

[0062] Orders entered using the left mouse button

[0063] If "Offset" mode chosen in Quantity Description field then:

$Bo = (Q_a + L)P$ (Eq. 3) If BidQ field clicked.

$So = (Q_b + L)P$ (Eq. 4) If AskQ field clicked.

[0064] If "number" mode chosen in Quantity Description field then:

$Bo = QP$ (Eq. 5)

$So = QP$ (Eq. 6)

[0065] If "NetPos" mode chosen in Quantity Description field then:

$Bo = NP$ (Eq. 7)

$So = NP$ (Eq. 8)

[0066] Orders also can be sent to market for quantities that vary according to the quantities available in the market; quantities preset by the trader; and which mouse button the trader clicks. Using this feature, a trader can buy or sell all of the bids or asks in the market at or better than a chosen price with one click. The trader also could add or subtract a preset quantity from the quantities outstanding in the market. If the trader clicks in a trading cell – i.e. in the BidQ or AskQ column, the trader will enter an order in the market. The parameters of the order depend on which mouse button the trader clicks and what preset values the trader set.

[0067] Using the screen display and values from FIG. 5, the placement of trade orders using the display and trading method is now described using examples. A left click on the 18 in the BidQ column 500 will send an order to market to buy 17 lots (quantity # chosen on the Quantity Description pull-down menu cell 502)

of the commodity at a price of 89 (the corresponding price in the Prc column 504). Similarly, a left click on the 20 in the AskQ column 506 will send an order to market to sell 17 lots at a price of 90.

[0068] Using the right mouse button, for example, 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 that equal or better the price in that row plus the quantity in the R field 508. Thus, a right click in the AskQ column 506 in the 87 price row will send a sell order to market at a price of 87 and a quantity of 150, where 150 is the sum of all the quantities 30, 97, 18 and 5. The quantities 30, 97 and 18 are all of the quantities in the market that would meet or better the trader's sell order price of 87. These quantities are displayed in the BidQ column 500 because this column represents the orders outstanding in the market to purchase the commodity at each corresponding price. The quantity 5 is the quantity pre-set in the R field 508.

[0069] Similarly, a right click in the BidQ column 500 at the same price level of 87 would send a buy limit order to market for a quantity of 5 at a price of 87. The quantity is determined in the same manner as above. In this example, though, there are no orders in the market that equal or better the chosen price – there are no quantities in the AskQ column 506 that equal or better this price. Therefore, the sum of the equal or better quantities is zero (“0”). The total order entered by the trader will be the value in the R field 508, which is 5.

[0070] An order entered with the left mouse button, for example, and the “Offset” option chosen in the quantity description field 502 will be calculated in the same way as above, but the quantity in the L field 510 will be added instead of the quantity in the R field 508. Thus, a left click in the BidQ column 500 in the 92 price row will send a buy order to market at a price of 92 and a quantity of 96. The quantity 96 is the sum of all the quantities 45, 28, 20 and 3. 45, 28 and 20 are all quantities in the market that would meet or better the trader's buy order price of 92. These quantities are displayed in the AskQ column 506 because this column represents the orders outstanding in the market to sell the commodity at

each corresponding price. The quantity 3 is the quantity pre-set in the L field 510.

[0071] The values in the L or R fields 510, 508 may be negative numbers. This would effectively decrease the total quantity sent to market. In other words, in the example of a right click in the AskQ column 506 in the 87 price row, if the R field 508 was -5, the total quantity sent to market would be 140 (30 + 97 + 18 + (-5)).

[0072] If a trader chose the "NetPos" option in the quantity description field 502, a right click, for example, would still work as explained above. A left click would, for example, enter an order with a price corresponding to the price row clicked and a quantity equal to the current Net position of the trader. The Net position of the trader is the the trader's current position on the chosen commodity. In other words, if the trader has bought 10 more commodities than the trader has sold, this value would be 10. NetPos would not affect the quantity of an order sent with a right click.

[0073] If the trader chose a number value in the quantity description, a left click would send an order to market for the current quantity chosen by the trader. The default value of the current quantity will be the number entered in the quantity description field, but it could be changed by adjusting the figure in the current quantity field 502.

[0074] An embodiment of the system also allows a trader to delete all of his working orders with a single click of either the right or left mouse button anywhere in the last traded quantity (LTQ) column 512 (this functionality can be provided in any general area of the screen as well or as an alternative). This allows a trader to exit the market immediately. An embodiment of the invention also allows a trader to delete all of his orders from the market at a particular price level. A click with either mouse button in the Executed/Working (E/W) column 514 will delete all working orders in the cell that was clicked. Thus, if a trader believes that previously sent orders at a particular price that have not been filled would be poor trades, the trader can delete these orders with a single click.

[0075] A process for placing trade orders using the display and trading method as described above is shown in the flowchart of FIG. 6. Prior to placing a trade order, the system provides preliminary fields for the input of data, such as the selection of a customer profile, the order quantity, and the maximum trade quantity. Once these preliminary fields are entered and the trader indicates the desire to place a trade order, the system will determine whether the trader performed the necessary actions to conduct a trade. For example, the invention will determine if the mouse pointer was positioned over a tradable cell when the attempt to click trade was performed. If it is determined that a viable trade was requested, the system will create and send a limit order to the exchange at a quantity and price based on the preliminary settings and market prices. The system affords a trader the opportunity to change the order quantity preset buttons. The default quantities for these power buttons are 1, 5, 10, 20, 50, and 100. However, in this preferred embodiment the trader can alter any or all of these default quantities by performing a right click on each specific button and manually entering a different number quantity.

[0076] In step 600, the trader has the display on the trading terminal screen showing the market for a given commodity. In step 602, the parameters are set in the appropriate fields, such as the L and R fields and the Current Quantity, NetPos or Offset fields from the pull-down menu. In step 604, the mouse pointer is positioned and clicked over a cell in the display by the trader. In step 606, the system determines whether the cell clicked is a tradeable cell (i.e. in the AskQ column or BidQ column). If not, then in step 608, no trade order is created or sent and, rather, other quantities are adjusted or functions are performed based upon the cell selected. Otherwise, in step 610, the system determines whether it was the left or the right button of the mouse that was clicked. If it was the right, then in step 612, the system will use the quantity in the R field when it determines the total quantity of the order in step 614. If the left button was clicked, then in step 616, the system determines which quantity description was chosen: Offset, NetPos or an actual number.

[0077] If Offset was chosen, then the system, in step 618, will use the quantity in the L field when it determines the total quantity of the order in step 614. If

NetPos was chosen, then the system, in step 620, will determine that the total quantity for the trade order will be the current NetPos value – the net position of the trader in the given commodity. If an actual number was used as the quantity description, then, in step 622, the system will determine that the total quantity for the trade order will be the current quantity entered. In step 614, the system will determine that the total quantity for the trade order will be the value of the R field (if step 612 was taken) or the value of the L field (if step 618 was taken), plus all quantities in the market for prices better than or equal to the price in the row clicked. This will add up the quantities for each order in the market that will fill the order being entered by the trader (plus the L or R value).

[0078] After either steps 614, 622 or 620, the system, in step 624, determines which column was clicked, BidQ or AskQ. If AskQ was clicked, then, in step 626, the system sends a sell limit order to the market at the price corresponding to the row for the total quantity as already determined. If BidQ was clicked, then, in step 628, the system sends a buy limit order to the market at the price corresponding to the row for the total quantity as already determined. The process described above is merely one embodiment and the present invention is not limited to this particular process or to any process.

[0079] One commercially available product that incorporates display screens of the type illustrated in Figures 2 and 3 is sold under the brand name X_TRADER[®] by Trading Technologies International, Inc., of Chicago, Illinois. Display screens of the type illustrated in FIG. 3 are sometimes referred to herein as MD_TRADER[™]-style displays. As discussed above, however, the trading tools of the preferred embodiments can be used with virtually any electronic trading application, unless otherwise noted.

[0080] Given the foregoing information regarding graphical user interfaces for electronic trading and their use, a number of trading tools will now be described. One or more of these trading tools may be incorporated into a trading application, for example, to assist the trader and improve the efficiency and timeliness of trading.

[0081] **Last Traded Quantity Marker**

[0082] The "Last Traded Quantity Marker," in accordance with a preferred embodiment, provides an indication of the Last Traded Quantity (LTQ). In a display that includes dynamic market information that is associated with a static price scale, such as the MD_TRADERTM-style display, the LTQ marker may move up and down the LTQ column as an associated LTQ price changes. One form of a LTQ marker 700 is shown in FIG. 7, where both a numerical value and a color or shading are used. For consecutive trades at the same price, the LTQ marker 700 may show, for example, either i) a cumulative quantity for all consecutive trades at the Last Traded Price, or ii) the quantity of only the most recent trade at the Last Traded Price. The accumulation of the total quantity for multiple LTQ occurrences is typically gateway (i.e. exchange) dependant. Most gateways, however, will accumulate the quantity. For gateways that do not accumulate the LTQ, a trading application, such as the application program interface illustrated in FIG. 1, may convert the LTQ into a cumulative indicator, if desired.

[0083] Generally, as long as a contract continues to trade at the same specific price, the LTQ will accumulate. When a contract trades at a new price, the marker may move beside that price and the quantity displayed inside the indicator box and will reflect the quantity of the last trade only. Should a contract trade at a price where a previous contract traded, the indicator will return to that price level, and the indicator box will again display the quantity of that last trade only (it will not add the newly traded quantity to the quantity that was displayed the last time the marker resided at this price). The indicator, located in the LTQ column 702, does not simply display the number of the last traded quantity. Rather, the marker also, by residing next to the price (in the price column 704) at which the last contract traded, indicates to the user the price at which that trade occurred. The LTQ marker 700 is preferably, but not necessarily, associated with the corresponding last traded price 706. It is not necessary that numerical values for a price or quantity be associated with the marker.

[0084] In accordance with a preferred embodiment, therefore, the LTQ marker 700 is a visual indicator of the last traded quantity. Any type of marker may be used as long as it may be recognized by the user as an indicator of quantity. Other indicators, such as color or a graphical indicator, like a sliding scale, thermometer-type scale or speedometer-type scale, may alternatively be used as a marker. The graphical indicators may, but are not required to, include associated numerical values. In further alternatives, however, combinations of indicators may be used to illustrate characteristics of an item of interest, like the LTQ. For example, the quantity itself may be presented numerically or graphically, and color may be used with the quantity indicator to illustrate a trend, such as increasing or decreasing volume or rate of change in volume, or increasing or decreasing price associated with the LTQ. In addition, although described in the preceding few paragraphs as a marker for the LTQ, these types of markers may alternatively be used for any item in the user interface that may be of interest to the user.

[0085] In addition, when the user interface is configured to display a consolidated static price scale, for example as described below under the heading Consolidation Control Icon, the LTQ cell 708 may be subdivided into price consolidation increments and a LTQ marker may be shown, for example, as a horizontal line, within the corresponding subdivision of the LTQ cell 708. The position of the graphical indicator, which in this example is a horizontal line, within the LTQ cell 708 provides a visual indication of the price within the consolidated range at which the last traded quantity changed hands.

[0086] Color Coding of Markers

[0087] As noted above, items of interest in the user interface may be color coded or highlighted using color or gray scale shades. In a preferred embodiment, the user interface is of the type shown in FIG. 3 having market data associated with a static price scale, such as the MD_TRADERTM interface, and color is used with the LTQ marker to provide a visual distinction between, for example, an increase or decrease in the price value associated with the Last Traded Quantity (LTQ) from the price value associated with the previous LTQ. In MD_TRADERTM, the

LTQ may be presented as a highlighted cell in the LTQ column 702, as shown in FIG. 7, which is displayed at a level that corresponds to the Last Traded Price (LTP) 706. In a preferred embodiment, the highlighted cell changes colors based on the market's price movements. For example, a LTQ cell 710 may be displayed with a background that is one color, such as blue, when the change in price associated with the LTQ is an increase from the price associated with the previous LTQ 708. Whereas a LTQ cell 712 may be displayed with a different colored background, such as red, when the change in price from the previous LTQ 708 decreases.

[0088] In addition, color may provide additional information about items of interest, like the LTQ. For example, when the commodity at issue has yet to have been traded during that current trading session, the LTQ column 702 may be shown in a particular color, such as gray, and may remain that color until a quantity has been filled. When a quantity has been filled, the cell displaying the first LTQ for that session may be highlighted in a particular color, such as green, signifying neither an up nor down tick from the previous LTQ. Subsequent fills will result in the LTQ cell being highlighted, for the preceding examples, in either a blue or a red color, unless the price level does not change from one trade to another, in which case the cell will remain green until there is a change in the price of the LTQ.

[0089] This benefits a trader in that the display of, and the color designation(s) for, the LTQ provides a visual reference of the market's price movements, status or trends, thereby permitting a trader to quickly absorb additional information, such as the direction of the market's activity. As a result of seeing the changes in the price of the last traded quantities, a trader can more easily determine market status and trends, thereby enhancing the likelihood of the trader entering orders and having those orders filled at desirable prices.

[0090] The color-coding of the LTQ appears as a colored cell (e.g., 700, 708 and 710) in the LTQ column 702 and corresponds to the price row of that traded quantity. By default in one preferred embodiment, the colored cell will appear in blue when the LTQ ticks upward in price from the previous LTQ, will appear in

red for instances when the LTQ ticks downward in price from the previous LTQ, and will appear in green for instances when the price level remains the same from one trade to the next. While these preferred colors are the default settings in one embodiment, the trading application preferably allows a trader to change color designations in accordance with the trader's own preferences. In addition, while certain embodiments have been described with reference to color being applied to a cell, the invention is not limited to embodiments in which color is applied to a cell. For example, color may be applied to any graphical indicator, such as the horizontal line used as a LTQ marker in the preceding section, to illustrate a property of the item of interest.

[0091] Overlay of Different Price Feeds

[0092] In one embodiment, the trading application provides an "Overlay of Different Price Feeds." The trading application may be X_TRADER[®], referenced above, or any other commercially available product adapted as described herein. In many instances a particular commodity is only traded at a particular exchange. In other instances, however, a commodity may be traded at multiple exchanges. This is one instance when a user may be interested in simultaneous information from different price feeds, i.e. feeds from different exchanges in regard to a particular commodity. As another example, Eurex offers both an inside market stream and a market depth stream. Generally, the inside market stream is faster than the market depth stream. In accordance with a preferred embodiment, the different streams, whether from a single exchange or multiple exchanges, are used by the trading application to populate and display information about the commodity in a trading window.

[0093] A number of exchanges offer multiple price streams, but these exchanges often supply only those feeds that are requested by the trader. Each trader may request, for example, a stream of all of the quantities currently available in the market for a specific commodity, known as market depth, or the trader may request to receive only the inside market prices, where the inside market is the highest buy price and the lowest sell price at which there is quantity available for that commodity. This is also known as the best buy and best sell prices. Many

traders are focused on these best prices, and therefore do not desire a stream of a market's depth. Thus, several exchanges cater to user preferences by offering different price feeds, while also benefiting by saving on bandwidth for traders who wish to receive only an inside market stream.

[0094] When using the 'overlay' feature, the system preferably displays all of the information that it receives, and the display continuously updates the cells. By accepting, or having the ability to accept, multiple feeds or streams, the trader is provided with greater security in knowing that if one feed should become slower or unavailable, the other feed will continue to update market information.

[0095] FIGs. 8 and 9 show a network 800 for the transfer of data from an exchange 802 to the client terminal 804 via parallel feeds carrying a first and a second price packet 806 and 808, respectively, through a router 810 and a Gateway 812. The client terminal 804 is running a trading application, such as X_TRADER[®], which presents data carried by the feeds to a user. When a disruption in one of the feeds, referred to as a "hiccup" or lost data, occurs in the network, as shown at 814 in FIG. 9, packets from the top feed are prevented from feeding into the trader's display. A disruption, as the term is used herein, is not limited to a situation in which data is permanently lost, but rather is used generically to also cover instances when data is corrupted, slow or otherwise delayed. Without an auxiliary feed in instances of lost data, the display would be void of prices, and opportunities for trading could be lost. Without an auxiliary feed in instances of slow or delayed data, trading decisions would be made based on out of date information.

[0096] Although illustrated as a disruption 814 occurring between the gateway 812 and the client terminal 804, the feed may be disrupted at any point from the exchange 802 to the client terminal 804. Because of the parallel feed, the display of current information is not interrupted, regardless of the cause of the disruption. Moreover, the parallel feed allows the user to take advantage of speed differences between two feeds and displays the best available information to the user. It should be noted that, although the streams are illustrated as originating from one exchange 802, the streams may alternatively originate at different exchanges. In

addition, while two feeds are typically sufficient, the preferred embodiments are not so limited, and information from more than two feeds may be simultaneously displayed.

[0097] In one embodiment of the invention, the 'Overlay Different Price Feeds' can be enabled or disabled by adding or removing a check in a 'Use Inside Market Prices' box in the a Properties dialog box. Other techniques for enabling this feature may alternatively be used. Where multiple feeds are being monitored and displayed, the trading application may provide the user with options for deciding which feed's data will be displayed in instances where the data from the feeds is not the same. For example, in instances where the feeds originate at different exchanges, the user may choose to display the best prices from the different feeds. As a further example, where the feeds originate at the same exchange, information from the most recent packet may be displayed, regardless of which feed carried the last displayed packet. Other alternatives will be apparent upon reviewing the foregoing.

[0098] **Display of Aggregated Working Quantities**

[0099] Another preferred embodiment provides a trader with a display of the aggregated quantities being worked in the market for a trader's buy and sell orders. A trader's total working quantities represent the total unfilled quantities of all the orders that the trader currently has entered but have yet to be filled in the market. For example, the trading application may display the total working buy quantities and the total working sell quantities for the specific commodity being traded and for the specific trader who entered those quantities in the market. FIG. 10 shows, as an example, a display for a trader who has separate working sell quantities of 14, 13, and 1 (at 1000), and separate working buy quantities of 5, 1, 15, 3, and 1 (at 1002). While this example utilizes an MD_TRADERTM-style trading interface, any type of trading interface may alternatively be used. The trading application calculates the sum of the trader's working sell quantities ($14 + 13 + 1 = 28$) and the sum of the trader's working buy quantities ($5 + 1 + 15 + 3 + 1 = 25$) and, in this example, displays the aggregated quantities in cells 1004. The aggregated working quantities may be

displayed in any manner or location that is helpful to the user. In another variation of this embodiment, the user may click directly on either the aggregated buy or sell quantity display cells to delete the working quantities displayed in those cells.

[00100] The display of a trader's aggregated working quantities in cells 1004 benefits a trader in that it provides the total exposure from the trader's working quantities. Although the display is dynamic, in that order quantities are continuously updated as new orders are entered and others are filled, the display of quantities at different market prices is limited by the size of the display screen. Thus, it is possible for a trader to have working quantities of which the trader is not aware at prices that are not visible in the display window. The aggregated working quantities display helps to alleviate this drawback by showing a trader the cumulative total of the trader's buy and sell working quantity. If the display shows anything but a zero, the trader will know that the trader currently has an unfilled working quantity in the market.

[00101] In the preferred embodiment, the display of aggregated working quantities, as shown in cells 1004 in FIG. 10, is presented to the user in conjunction with buttons that may be actuated by the user. As noted above, the user may use an input device, such as a mouse, to click the buttons 1006, 1008, thereby deleting the working orders associated with the displayed aggregated working quantities. One button 1006 displays the aggregated buy working quantity. The other button 1008 displays the aggregated sell working quantity. The aggregated totals that appear on each button 1006, 1008 are calculated from the non-aggregated working quantities as displayed in a working quantities column 1010, as shown in FIG. 10. In both the working quantities column 1010 and the aggregated quantity buttons 1006, 1008, the buy quantity is highlighted, in a preferred embodiment in a color, such as blue, and the sell quantity is highlighted, in a preferred embodiment in a different color, such as red. The user preferably has the option of whether to display the aggregated quantity buttons via, for example in MD_TRADER™, the properties settings window. The quantity buttons appear by default for new sessions. Of course, aggregated

working quantities may be displayed by any trading application, as an alternative to the type of display illustrated in FIG. 10.

[00102] Dynamic Indicator

[00103] Another preferred embodiment provides the user with the ability to paste a dynamic indicator for display in relation to, for example, a static price scale. In one embodiment, a first dynamic indicator column is displayed adjacent to the bid quantity column, and a second dynamic indicator column is displayed adjacent to the ask quantity column. The dynamic indicator may be applied to a dynamic indicator column from a spreadsheet, such as Microsoft EXCEL, or other third party charting or analytical software, to furnish the user with a visual indicator of, for example, a specific price. The display screen may, for example, be an MD_TRADER™-style display generated by the X_TRADER® trading application, although other trading applications and trading interfaces may alternatively be used.

[00104] The dynamic indicator is preferably associated with market information. In a preferred embodiment, the dynamic indicator is associated with a price, although it may alternatively be associated with any other item of interest to the user. Color coding may be applied to the dynamic indicator.

[00105] When used, for example, with an MD_TRADER™-style display, a dynamic indicator may be associated with a specific price, as set by a trader using the third party software, and displayed in relation to a static price scale. If the dynamic indicator is associated with a price that is outside of the viewable area of the trader's display, it preferably becomes viewable on the screen when the associated price comes into view. Although a preferred embodiment of the invention involves copying and pasting to and from a spreadsheet, other methods of transferring information may also be used.

[00106] Use of this particular embodiment is initiated when a trader enters or pastes a value into a spreadsheet 1100. For example, the value may be a specific price that the trader wants to monitor, or it may be a dynamic price that includes an attached calculation. The indicator is not limited to use with prices, but

alternatively may be used for any item of interest on the trader's display. In the price example, once the value is entered in the spreadsheet, the trader copies the desired price cell(s) from the spreadsheet and pastes the cell(s) in one of the dynamic indicator columns 1102 of the screen, as shown in FIG. 11A. Upon pasting the cell(s) in the dynamic indicator column, a display marker, also referred to as a dynamic indicator 1104, highlights a cell in the indicator column 1102 that corresponds to the price calculated in the spreadsheet or other software.

[00107] The marker may be anything that is suitable to serve as an indicator for the trader, including, for example, graphical symbols and colors. Thus, although FIG. 11A shows an entire highlighted cell 1104, the marker may alternatively be color-based, such as a highlighted or colored foreground, background, border or portion of the cell. It is not necessary that the dynamic indicator occupy an entire cell. For example, in instances where the trading interface includes a static price scale, and the price scale is consolidated, it may be desirable to locate the dynamic indicator at a position within a cell that corresponds to a specific price. In addition, the marker may mark a range of prices. Preferably, the type of marker is selectable by the user.

[00108] Preferably, a link is established from the pasted cell to the spreadsheet 1100 from which the cell(s) was copied. The link gives the trader the ability to change the copied value in the spreadsheet 1100, resulting in a related change in the pasted value in the dynamic indicator column 1102. In one embodiment, this may be a two-way link between the trading interface and the third party software, or may link market data from the trading window, such as LTP or any other item of interest, into the spreadsheet or other third party software. Any suitable type of data exchange protocol may be used to embed information from the third party software or to link the dynamic indicator to the third party software. For example, Microsoft OLE 2.0 may be used to perform these functions when using Microsoft Windows applications as the third party software. In a preferred embodiment, Microsoft OLE is utilized to provide a link between a dynamic indicator and a cell from a Microsoft EXCEL spreadsheet. Data exchange protocols in general, and linking and embedding techniques in particular, are well known to those skilled in the art.

[00109] The meaning of the pasted dynamic indicator, and whether there is a dynamic calculation attached, is preferably at the decision of the individual trader. For example, the trader may want the dynamic indicator to represent a 'Fair Value Analysis' (average price). This would calculate the average price at which the specific commodity traded throughout the day. The trader would copy and paste the cell, with the attached calculation, into the dynamic display column. As the average price changed with each newly filled quantity, the dynamic indicator would move up or down the indicator column in conjunction with the appropriate price. When that indicator would move to a price viewable on the screen, the trader then could see a visual indicator of the 'Fair Value' price, and the trader could choose to enter quantity if the trader so desired. Although illustrated with reference to the 'Fair Value' price, it is to be appreciated that any calculation may alternatively be used.

[00110] As noted above, the dynamic indicator may also appear in only a portion of the cell. The dynamic indicator may be highlighted, for example, in a different color than the remainder of the cell or the surrounding cells, or may be displayed in time-alternating colors to create a flashing effect. The dynamic indicator may be presented as a highlighted or colored line within a cell. The portion of the cell in which the dynamic indicator appears may be selected to convey additional information, such as a price that falls between prices in a static price scale, for example when price consolidation is utilized. FIG. 11B illustrates a dynamic indicator column 1102 in which a dynamic indicator is shown by highlighting only a portion of a cell 1110.

[00111] The dynamic indicator benefits a trader in that the trader is provided, for example, with the ability to monitor price movements of the trader's own designation, whether those movements are of the last traded price, the 'Fair Value', or any other designated item of interest. By seeing the visible dynamic indicator associated with the trader's designated item of interest, the trader has a better opportunity to enter quantities at prices that are desirable. In addition, the trader can paste a dynamic indicator while continuing to enter other quantities throughout the trading session, and the indicator will continue to update as long

as the session is open. Thus, the trader may find that a desirable price, as shown by the indicator, is available in the market long after the trader originally copied and pasted the indicator. Furthermore, the dynamic indicator may decrease the time it takes for the user to analyze market data by providing the user with a visual cue.

[00112] The display of the highlighted dynamic indicator, the color of which, in instances where color is used, may be selected by the trader through, for example, a properties window, appears in the buy and/or sell dynamic indicator columns on the display. The indicators can be moved to various locations on the display. Of course, more than one dynamic indicator may appear in any dynamic indicator column. In one embodiment that utilizes the MD_TRADER™-style display, the dynamic indicator columns appear by default to the immediate left and right of the buy and sell quantity columns, respectively, as shown in FIG. 11A. It is not necessary, however, that an entire column, row or other display element be devoted to display of a dynamic indicator. The dynamic indicator may alternatively be applied in the display on a cell-by-cell basis or may overlay other displayed information.

[00113] **Out of Range Indicator**

[00114] In accordance with a preferred embodiment, the graphical user interface for a trading application provides an indication that an item of interest is outside the viewable range of the display. The trading application may be X_TRADER®, referenced above, or any other commercially available product adapted as described in this section. Preferably, the out of range indicator also provides a user the ability to cause the display to shift up or down so that the user may view the item(s) of interest that lie outside of the viewable area. Examples of items of interest include, but are not limited to, the user's working orders and market depth information, such as quantities and prices.

[00115] In one embodiment, the out of range indicator is an arrow or similar pointing icon, which will indicate to the user that an item of interest lies outside the viewable area and further indicates the direction in which the viewable area

needs to move to display the item of interest. Preferably, the viewable area will scroll or jump to the item of interest when the user clicks on or otherwise actuates the pointing icon. Each time the out of range indicator is used, the display may shift to the closest item of interest outside of the viewable area. As an alternative to jumping to the next item of interest, the display may shift row-by-row, column-by-column, price-by-price, or may jump to a new level based upon a selected item of interest.

[00116] For example, as shown in FIG. 12A, quantities are entered (and are viewable on the display) at sell prices of 109225, 109250, 109400, etc. If 109525 is the next highest price for which quantity is entered, but that quantity is beyond the viewable area, the trader can use an out of range quantity indicator, illustrated in this example as an 'up arrow' 1200 function, to shift the display up so that the quantity is viewable. Each ensuing use of the 'up arrow' 1200 function will result in the display of the next highest sell price for which quantity is entered in the market.

[00117] Continuing with this example, the same general principles apply when employing the 'down arrow' 1202 function. Specifically, in FIG. 12A, quantities are viewable on the trading screen at the buy prices of 108975, 108875, 108825, etc. If 108650 is the next lowest buy price for which quantity is entered in the market, then the trader could use the 'down arrow' 1202 function to display that quantity. Each ensuing use of the 'down arrow' 1202 function results in the display of the next lowest buy price for which quantity was entered in the market.

[00118] By using the out of range indicator (e.g., 1200, 1202), which in this example indicates out of range market quantities, the trader can essentially view the entire market depth provided by an exchange. The display of the entire market depth may be limited, for example, by the size of the user's display screen, or the user's preferences about the amount of market information that is displayed at any one time. Due to these constraints, it is possible that there may be items of interest, such as market depth or working orders, that the user cannot see. The out of range indicator not only alerts the user to the existence of an out

of range item of interest, but also ensures that all such information is viewable via, for example, the 'up arrow' 1200 and 'down arrow' 1202 function.

[00119] When items of interest fall outside the viewable range, the trading application preferably generates cells, for example each with an arrow pointing up or down, as appropriate, at the top and/or bottom of the column related to the item of interest. The arrow cells are preferably enabled only when an item of interest, like a quantity entered in the market, falls outside of the viewable area. If no items of interest fall outside the viewable area, in one embodiment of the invention, the cells are inactive and may be presented on the display in a solid color without an arrow. As an alternative to the use of buttons with pointing icons, a preferred embodiment allows a user to scroll the market data in a desired direction using a mouse wheel or other user input device.

[00120] As noted above, the out of range indicator may alternatively, or in addition, be used to alert the user to out of range working orders. In this example, each time the indicator is used, the display preferably shifts to the user's next working order in the market that is outside of the viewable area. For example, as shown in FIG. 12B and evidenced by the working quantities present in the working quantities column, a trader has quantities entered (and viewable on the display) at sell or offer prices of 109200, 109250, and 109300. If 109550 is that trader's next highest price for which quantity is entered, but that quantity is beyond the viewable area, the trader can use the indicator, in this example an 'up offer arrow' 1204 function, to shift the display up so that the quantity is viewable. Each ensuing use of the 'up offer arrow' 1204 function results in the display of the trader's next highest offer price for which quantity is entered in the market. As stated above, the display alternatively may shift row-by-row, column-by-column, price-by-price, or may jump to a new level based upon a selected item of interest.

[00121] The same general principles may apply in regard to working buy orders, by employing a 'down bid arrow' 1206 function. For example, in FIG. 11B the trader has quantities entered and viewable on the trading screen at the buy or bid prices of 109025, 109000, 108975, 108875, and 108825. If 108650 is that

trader's next lowest bid price for which quantity is entered in the market, then the trader could use the 'down bid arrow' 1206 function to display that quantity. Each ensuing use of the 'down bid arrow' 1206 function results in the display of that trader's next lowest bid price for which the trader has quantity entered in the market. Regardless of which arrow is being used, the screen will shift to quantities that the trader has entered in the market.

[00122] By using the out of range indicator (e.g., 1200, 1202, 1204 and 1206), the trader preferably may view information related to all of his or her working orders. This indicator reduces the potential for missed and forgotten opportunities or exposure by ensuring that all of the user's working orders are viewable via the 'up offer arrow', the 'up bid arrow', the 'down offer arrow' and 'down bid arrow' functions. The pointing icons, or arrow buttons, discussed above may be located at the top and/or bottom of any column of interest, or to the left and/or right side of any row of interest, that includes data that falls outside of the viewable range, including for example working orders that fall outside the viewable range. Other uses for the out of range indicator will be apparent to those skilled in the art upon reviewing this detailed description. Although described above with reference to pointing icons and/or arrow buttons, any type of indicator may alternatively be used as long as it is capable of indicating to the user that there is information outside of the viewable range.

[00123] **'Thermometer' Indicator**

[00124] In accordance with a preferred embodiment, the trading application provides a display to the user illustrating the volume of buy and sell quantities, in proportion to each other, in a logical, dynamic manner. The trading application may be X_TRADER[®], referenced above, or any other commercially available product adapted as described in this section. In one embodiment, which is advantageously used in a trading application that displays price along a vertical axis, like X_TRADER[®], the 'thermometer' indicator generates one or more narrow, vertical display columns 1300, 1302 ("thermometers"), located in proximity to the quantity columns as shown in FIGs. 13A & 13B. The thermometers 1300, 1302 may or may not be associated with a numeric display of

the total number of buy and sell orders in the market for a particular commodity. When there is quantity available in the market, the thermometers 1300, 1302 are preferably shaded in a manner that coincides with the percentage of buy versus sell quantities in the market. For example, if the buy and sell quantities in the market are equal, meaning that 50% of the quantity is buy quantity and 50% is sell quantity, then both thermometers 1300, 1302 are shaded 50%, as shown in FIG. 13A. In alternative embodiments, thermometer indicators may represent a relationship between any two items of interest to the user. Although vertical bars are shown in the illustrations, it should be understood that any visual indicator may alternatively be used, as long as the indicator is capable of conveying the appropriate information to a user.

[00125] These thermometer columns are preferably adjustable in that the user may move the thermometer columns to various locations on the display as logic or user preference dictate. One preferred location, when the thermometer indicator is to represent the volume of buy quantities in relation to the volume of sell quantities, is immediately to the left of the buy quantity column and to the right of the sell quantity column. In this embodiment, the display of the thermometers may begin at the mid-point of the prices displayed on the screen. For example, in FIGs. 13A and 13B, the mid-point is between the prices of 90 and 85. The buy quantity thermometer descends from the mid-point to the lowest price displayed on the screen (45), and the sell quantity thermometer extends to the highest price displayed (130).

[00126] As noted above, the two thermometers show the quantity available in the market, with one thermometer each for the buy quantities and the sell quantities. In the illustrated embodiment, both thermometers extend from the mid-point price that is currently on the user's display. The buy thermometer preferably reaches to the lowest price displayed, while the sell thermometer preferably extends to the highest price displayed. The thermometer for the buy quantity descends from the top of the thermometer as the percentage of buy quantity increases. The thermometer for the sell quantity rises from the bottom of the thermometer as the percentage of sell quantity increases. If either the buy or sell quantity is larger than the other, the thermometers will reflect this difference based on the amount

of the disparity. FIG. 13B, for example, reflects a scenario where 95% of the quantity in the market is buy quantity and 5% of the quantity in the market is sell quantity. Therefore, the buy thermometer 1304 is shaded a great deal more than the sell thermometer 1306 to represent the disparity. Although described with reference to a thermometer indicator, any type of graphical indicator may alternatively be used to present the user with information about an item of interest. An alternative to displaying graphical indicators, like thermometers, is to display the market depth numerically, such as an aggregated sell quantity and an aggregated buy quantity, or as a percentage or ratio between buys and sells.

[00127] The thermometer indicator benefits a trader by showing the disparity of buy verses sell quantity in the market, thereby providing the trader with a tool to help decide whether to enter orders to buy or sell. For example, if there is a higher percentage of buy quantity in the market, then a greater number of the traders may want to buy, whereas if there is a greater percentage of sell quantity in the market, then a greater number of traders may want to sell. A trader can therefore deduce that with a greater percentage of buy quantity in the market, the trader may have a higher chance of having the trader's sell order filled at a desirable price if the trader were to enter such a sell order. If the percentage of sell quantity was higher in the market, the trader may have a greater chance of having the trader's buy order filled at a desirable price.

[00128] **Auto Scalper**

[00129] In accordance with another preferred embodiment, the trading application provides a way to automatically enter offsetting orders. The trading application preferably is X_TRADER®, using an MD_TRADER™-style display. Scalping is a term that is well known in the trading of commodities and it refers to a trading technique in which the trader trades for relatively smaller gains over a short period of time. In this embodiment, the trading application facilitates scalping by providing the user with an automatic order entry mechanism, embodiments of which are further described below. Preferably, automatic scalping is activated based on a user input, such as simultaneously pressing the control key and the scroll wheel on the user's mouse to manipulate a pair of indicator bars in the form

of horizontal lines. Other actuating mechanisms may alternatively be used, including for example using a dialog box generated by the trading application or by actuating a scalping icon displayed on the user interface.

[00130] For this embodiment in which a mouse input is used to position parallel horizontal lines, the indicator bars define a price range where buy and sell quantities may be automatically entered when a similar such quantity is manually entered and filled. More specifically, this feature automatically enters sell quantities when a trader's manually entered buy quantity is filled. Likewise, this feature will automatically enter buy quantities when a trader's manually entered sell quantity is filled. The indicator bars move in relation to a static scale or axis representing prices. In a preferred embodiment, the indicator bars span the buy column, the sell column, and the price column, and they begin together at the mid-point of the prices displayed on the trader's display screen. In FIG. 14A, that mid-point 1400 is between the prices of 90 and 85. When the trader enables this embodiment and scrolls the wheel on the trader's mouse up, the indicators move further apart, leaving a greater number of prices within the range of the indicator bars 1402. When the trader scrolls the wheel down, the indicator bars move closer together (nearer to the mid-point), reducing the number of prices within the indicator columns, as shown in FIG. 14B.

[00131] The order that is automatically entered is preferably for the same quantity as the trader's last buy or sell fill. Additionally, the order that is automatically entered is entered at a particular price or prices, depending on the preferences and/or practices of the trader, within the range of the indicator bars. In one embodiment, the order that is automatically entered is, in the case of a sell order, at the lowest price above the inside market within the range of the indicator bars, and in the case of a buy order, at the lowest price within the range of the indicator bars. Alternatively, the order that is automatically entered, may be at a price or prices calculated pursuant to any algorithm. For example, the quantity ordered may be evenly spread among the prices above (in the case of a sell order) or below (in the case of a buy order) the inside market and within the range of the indicator bars. The preferred embodiments are not limited to any particular technique for determining the price or prices at which the automatic order is

entered. In a preferred embodiment, the user may set the rules for exactly how a duplicate order or orders are sent (whether at the best price or some other price).

[00132] For example and as shown in FIG. 14A, the indicator bars 1402 are set with the highest price at 110 and the lowest price at 65. The inside market, as indicated by the black line, is a buy price of 100 and a sell price of 105. If a trader using the automatic scalper enters quantity in the buy column and that quantity is filled, in one embodiment the system will automatically enter a duplicate quantity in the sell column at the lowest price above the inside market and within the range of the indicator bars, which in this example would be a sell price of 105.

[00133] A trader's position may be defined as the difference between the total quantity of the commodities bought and quantity of the commodities sold, and the trader is considered to have a long position when the quantity bought is greater than the quantity sold and a short position when the quantity sold is greater than the quantity bought. The more quantity the trader owns, the longer the trader's position will be. Conversely, the more quantity the trader sells, the shorter the trader's position will be. It may be desirable to have neither a long nor short position, referred to as a closed position, at the end of each day's trading session. If the buy quantity that the trader has entered in the market is filled, thus giving the trader a long position, the system, if actuated by the user, may automatically enter a duplicate sell quantity, which when filled will close the trader's position. Likewise, if the sell quantity that the trader has entered in the market is filled, the system may automatically enter a duplicate buy quantity, which when filled will close the trader's position. The automatic scalper automatically and, preferably, immediately enters a duplicate buy or sell quantity, which when filled will close the trader's position, preventing the trader from carrying a long or short position for an extended period of time.

[00134] In an alternative embodiment, the automatic scalper embodiment may be used to set one range, using, for example, indicator bars, for buying quantity and another range for selling quantity, at the same time. For this embodiment, the automatic scalper automatically quotes both sides (buy and sell) within the ranges determined by the user. In another alternative embodiment, multiple automatic

scalping ranges, using different pairs of indicator bars, may be active in a single trading window. For this embodiment, the different ranges may be distinguished by using, for example, different colors for the different pairs of indicator bars.

[00135] Price Level Reasonability Check

[00136] In accordance with another preferred embodiment, the trading application provides a user with the ability, referred to as the Price Level Reasonability Check ("PLRC"), to prevent the entry of any order in the market at a price that is a specified number of ticks away from the Last Traded Price (LTP), or at a price that is a specified percentage different from the LTP. A tick can be anything, but is generally used in this detailed description as the minimum change in a price value that is set by the exchange for each commodity (e.g., \$.01, \$.05, \$.10, or any other value). The trading application may be X_TRADER[®], referenced above, or any other commercially available product adapted as described in this section. The PLRC may be enabled and configured by either a user, such as a trader or an administrator. For systems in which an administrator enables the PLRC, the PLRC may be applied uniformly to all client terminals on a network, or it may be adjusted on a case-by-case basis, thereby accounting, for example, for the experience level of the trader.

[00137] The PLRC may preferably be enabled on a commodity-by-commodity basis. For example, in FIG. 15A, a trader has entered a value of five to designate the maximum number of ticks from the LTP at which the trader is willing to enter an order in the market. As shown in FIG. 15B, the market for the commodity being traded has a tick value of five. Therefore, as dictated by the LTP of 90, the tick increment of five, and the PLRC value of five, should the trader choose to sell the commodity, the trader can enter an order at a price of 90, 85, 80, 75, 70, and/or 65. As shown in FIG. 15B, 90 is the last traded price, and the prices of 85, 80, 75, 70, and 65 are the sell prices that are less than or equal to five ticks away from that LTP. If the trader attempts to sell quantity at a price of 60 or below, the trader would be restricted from doing so because the price is beyond what the trader's PLRC value will allow. The same trader could buy the commodity at a price of 90, 95, 100, 105, 110, and/or 115. Each of these prices is within five ticks

(the PLRC value) of the LTP. If a trader attempts to buy quantity at a price of 120 or higher, the trader would be restricted from doing so because the price is beyond what the trader's PLRC value will allow. The PLRC function may alternatively allow a trader or administrator to enter a percentage instead of a number of ticks to designate the maximum deviation from the LTP at which the user is allowed to enter orders in the market.

[00138] In an alternative embodiment, the trading application may provide a volatility adjusted PLRC function. In this embodiment, the PLRC dynamically increases or decreases the number of ticks (or percentage) away from the LTP within which a user may enter orders. The increase/decrease, which may be set by the user or a system administrator, is preferably based on volatility. For example, a trader may set the trading application to dynamically increase the PLRC by a specified amount if the volatility is greater than a specified amount.

[00139] The inclusion of the PLRC function limits the possibility of the trader having the working quantity filled at less desirable prices. The inside market is those prices, for which there is quantity available in the market, that are considered the best buy and sell prices available. The best buy price is the highest buy price that has quantity in the market, while the best sell price is lowest sell price that has quantity in the market. Generally, the LTP will be at or near to that inside market. The LTP is used as the center price from which the PLRC begins and allows quantity to be entered at a limited number of price levels either above or below that LTP level.

[00140] In one preferred embodiment, where the trading application is X_TRADER[®], the PLRC is preferably enabled through the 'Options' display, an example of which is shown in FIG. 15B, by checking the "Price Level Reasonability Check" option box 1500 and then entering a value in the adjacent box 1502, designating the number of ticks that quantities can be filled beyond the last traded price value. Although the PLRC is described with reference to setting a boundary on acceptable prices for working quantities, the same technique may be used to constrain many other trading activities, such as the quantity associated with any order or to limit the total quantity being quoted by any individual user.

Implementation of these variations is analogous to the implementation of PLRC described above and those skilled in the art can implement the variations based on this detailed description.

[00141] Group Positioning and Automatic Grid Positioning

[00142] In accordance with another preferred embodiment, the trading application may re-position any item of interest within the trading interface. In one embodiment, the trading application tracks the market's activity by automatically centering, for example, the inside market or the Last Traded Price ("LTP") on the display with respect to a static axis or scale of prices. Preferably, any other item of interest in the trading interface may serve as the basis for positioning information within the display.

[00143] The trading application preferably is X_TRADER[®], using an MD_TRADER[™]-style display. In a preferred embodiment, the LTP is displayed in the LTP column and is indicated by a highlighted cell directly next to the price cell corresponding to the most recently filled quantity. The LTP cell preferably also contains an indication of the quantity of the most recent fill. The inside market is indicated by a line spanning both the buy and sell columns and is positioned between the highest buy price at which there is quantity currently in the market (the best buy price) and the lowest sell price at which there is quantity currently in the market (the best sell price).

[00144] Preferably, a user may designate any item of interest as the basis for the positioning function, such that, upon positioning, the item of interest will be moved to a predetermined location on the user's display. Automatic positioning may be triggered either by a timer, or by monitoring movement of the item(s) of interest about the display. Two items of interest to many traders are the inside market and the LTP. Thus, in one embodiment, the user may select one of these items for automatic re-positioning. When either the highlighted LTP cell or the inside market line is outside of the viewable area of a trader's display, or is more than a predetermined distance away from a location on the display, the LTP cell or the inside market line will automatically be placed at a predetermined location

on the display. In a preferred embodiment, automatic positioning parameters may be selected by the user from the 'Options' display. The user may choose, for example, whether to re-position the display after a designated number of seconds, when the LTP is a designated number of cells from the top or bottom of the trader's display screen, or when the inside market is a designated number of cells from the top or bottom of the trader's display screen.

[00145] In addition, a trading application may present multiple trading windows to the user simultaneously. In accordance with a preferred embodiment, the automatic positioning tool may be applied globally to any number of open trading windows. Preferably, a dialog box or menu item may be used to enable the user to group or link, for purposes of re-positioning, any number of trading windows. In accordance with one embodiment, at least one of the linked trading windows becomes the master, and the other linked trading window(s) will be re-positioned whenever the master trading window is re-positioned. For example, one of the trading windows may be designated by the user as the master trading window by selecting "re-position all," or any similar designation, from a menu or dialog box. This may have the effect of re-positioning all open trading windows when the master trading window is re-positioned. The user may choose to have one or more trading windows ignore the re-positioning command by selecting "ignore," or any similar designation, from the menu or dialog box. This group re-positioning feature may be used in conjunction with the automatic re-positioning tool or with manual re-positioning (such as through the click of a center mouse button or the use of any input device). Other techniques for grouping trading windows will be apparent to those skilled in the art upon review of this detailed description.

[00146] In a preferred embodiment, the positioning tool serves to center the item of interest (such as the LTP or the inside market) on the display. As shown in FIG. 16A, the LTP is displayed in the LTP column 1602 and is indicated by a highlighted cell 1600 (the color of which may be designated by the trader). This cell 1600 appears next to the price cell 1604 corresponding to the most recently filled quantity. The inside market is indicated by a solid line spanning both the buy 1608 and sell 1610 columns, and is between the highest buy price at which

there is quantity currently in the market and the lowest sell price at which there is quantity currently in the market. FIG. 16B is a display showing how a trader may select and manipulate the automatic grid centering feature. Although presented in FIGs. 16A and 16B as being applied to a scrolling vertical scale, it should be understood that the preferred embodiments are not so limited. Rather, automatic positioning may be applied regardless of the direction of movement or the number of dimensions in which information is displayed.

[00147] As quantities are entered and filled in the market, the LTP and inside market change to indicate the price of the last filled quantity and the most recent best buy and sell prices. In a volatile market, a large number of quantities can be filled in a relatively short period of time, resulting in a continuous fluctuation of the LTP and inside market. The LTP and the inside market are two indicators that a trader may use to understand at what prices other traders find a commodity to be most desirable. A trader may use automatic positioning to always have a visual reference of where the market is trading, increasing the likelihood of entering quantities and having those quantities filled at desirable prices. In addition, automatic positioning may be used in conjunction with manual positioning. In other words, it is preferable that by enabling automatic positioning, the user is not thereby precluded from manually re-positioning the display.

[00148] **Highlight Mid-Point of Last Re-Position**

[00149] In accordance with a preferred embodiment, a trader may emphasize the mid-point of prices and/or quantities entered in the market at the time of the last re-position event. Preferably, a re-position event centers the display around the inside market, where the inside market is the highest buy price and the lowest sell price for the commodity being traded for which there is quantity in the market, or alternatively, a re-position event may center the display at any price and/or quantity, if so desired. Furthermore, a re-position event does not need to center on any particular price, but may ensure that a particular price, or other item of interest, is positioned at a predetermined location, or within a range of locations, on the display.

[00150] In the preferred embodiment, the mid-point is designated by a bold line that spans the columns of the display screen, or in another embodiment, the mid-point may be designated by a color, arrow, text, and so forth. Preferably, the exact location of the mid-point line is dependent on the number of the price rows that are displayed between the best buy and best offer price rows (at which quantity is available) at the time of the last re-center event. Alternatively, the location of the mid-point line may be dependent on the quantities of a portion, or all, of the buy and sell orders, or may be dependent on the combination of price and quantities of the portion or all of the buy and sell orders. In yet another alternative, a bold line representing a particular price level may be displayed in association with any item of interest to the user, to thereby adjust the content of the trading interface to the user's preferred range.

[00151] Of course, markers other than a line may alternatively be used. For example, like many of the foregoing embodiments, the marker may be highlighting, a color or a graphical indicator disposed upon the display at the desired location. According to this embodiment, a trader may benefit from the visual representation of the discrepancy between the best bid and offer prices currently in the market.

[00152] According to the preferred embodiment, when the number of price rows between the best bid and best offer price rows (where quantity is entered) is an even number (or zero), the mid-point line is displayed between the middle values, with these being the highest buy (bid) price and the lowest sell (offer) price that are displayed in the window. For example, in FIG. 19A, the best bid price is 75 and the best offer price is 100. In this example, the display for the product is traded in ticks in increments of 5. As a result, the prices that are displayed between the best bid and best offer prices are 80, 85, 90 and 95. Because the total number of prices between the best bid and best offer is an even number, the mid-point line 1800 is displayed between the highest bid price of 85 and the lowest offer price of 90. Other methods may alternatively be used to determine the mid-point of an even number of rows, cells or columns.

[00153] In addition, according to the preferred embodiment, when the number of price rows between the best bid and the best offer prices (where quantity is entered) is an odd number, the mid-point line is displayed in the top of the cell that signifies the middle price value of the prices displayed between the best bid and best offer prices. For example, in FIG. 19B, the best bid price is 85, and the best offer price is 105. The display for the product being traded ticks in increments of 5. As a result, the prices that are displayed between the best bid and the best offer are 90, 95 and 100. Because the total number of prices between the best bid and best offer is an odd number, the mid-point line 1902 is displayed above the price row of 95 because 95 signifies the middle price value of the prices displayed between the best bid and best offer prices. It should be understood that the mid-point line 1902 may be displayed below or in the middle of the price row of 95 to indicate the middle price value. Other methods may alternatively be used to determine the mid-point of an odd number of rows, cells or columns.

[00154] While the preferred embodiment utilizes an MD_TRADER™-style display with a vertical static price axis or scale, this trading tool may be utilized with any display in which market information, such as bids, asks and/or working orders, are displayed relative to a static scale or axis of prices. It is not necessary that the scale or axis be vertical or even two-dimensional. Rather, the market information may be displayed horizontally, at an angle, n-dimensionally, or in any other fashion.

[00155] The display of the mid-point line may be enabled through an 'Options' display, an example of which is shown in FIG. 19C, by clicking the box 1906 directly to the left of the 'Highlight Midpoint of Last Re-center' option. Other techniques known to those skilled in the art, such as selecting this tool from a menu, may alternatively be used. Also, highlighting the mid-point may be applied to a variety of applications where the trader would like to highlight a midpoint that corresponds to prices and/or quantities, or any other item of interest.

[00156] **Drag and Drop of Working Quantities**

[00157] In accordance with another preferred embodiment, the trading application permits the trader to change the trader's working orders by dragging and dropping working quantities from one price level to another price level vis-à-vis a static price scale or axis. The trading application preferably is X_TRADER[®], using an MD_TRADER[™]-style display. When using an MD_TRADER[™]-style display to drag and drop a working order, in one embodiment, the trader clicks on an active cell within the working quantity column. This activates the drag and drop feature and allows the trader to manipulate the cell by moving the cell on the trader's trading screen. Such a manipulation is commonly referred to as "dragging" the chosen data. Prior to releasing the mouse button, a trader drags the working order by moving the cursor to a new cell in the working quantity column. The trader then releases or "drops" the data in a new cell. In a preferred embodiment, the ability to drag and drop working orders as described herein is an option that may be turned on or off by the user for each individual trading window.

[00158] At the point the data is dropped, the previous quantity may be deleted from the original price and a new quantity entered at the price associated with the cell in which the new working quantity was dropped. The quantity displayed in either the buy or sell column that corresponds to the traders working quantity also moves to the newly selected price level when the drag and drop function is performed. Any approach may be used to change the user's working orders. For example, rather than resulting in the deletion of an existing working order and the entry of a new working order, a single cancel and replace, as known to those skilled in the art, may be used to change the user's working orders.

[00159] The ability to drag and drop working quantities, as displayed in the working quantities column, can be used by a trader who is not satisfied with the current price at which such quantity is entered in the market. The trader is given the capability of changing the price level at which the trader's quantity is entered without having to both delete and re-enter the quantity, resulting in a valuable time savings by simply dragging and dropping that quantity.

[00160] Preferably, the drag and drop feature makes it possible for a trader to move the entire working quantity of a single cell from one cell to another cell in

the working quantity column when that quantity actually consists of multiple orders. For example, if a trader's working quantity is 30 at the price of 102.54 (1700), as shown in FIG. 17, that quantity may actually consist of three separate 10-lot orders, where a lot consists of multiple quantities that are traded together. Should the trader drag and drop that working quantity to the price of 102.57, the entire quantity of 30 (all three lots) will move cohesively to the new price level. Although the quantities were entered separately, once entered, they are treated as a cohesive whole.

[00161] The ability to drag and drop an entire quantity, regardless of the number of orders associated with that quantity, benefits a trader in that the trader does not need to constantly change the trader's quantity setting. The trader also does not have to repeat the drag and drop action for each order. For example, a trader may be trading at a quantity of 10, and therefore every time the trader enters a quantity in the market, the trader is entering a 10-lot order. If the trader wants to enter a quantity of 30, the trader can either change the quantity setting or click in the appropriate cell three times, thus entering three separate 10-lot orders in the market. Should the trader choose to drag and drop the working quantity from one price level to another, all of the working quantity associated with the cell and price level at which the drag and drop is performed will be moved to the new price level. As a result, the trader does not have to perform three separate drag and drop actions and valuable time can be saved, which could help to ensure that the quantities are entered and filled at their intended prices.

[00162] The display of a trader's working quantity appears in the working quantity column in a cell that corresponds to the price at which the quantity was entered. The display of the trader's working quantity remains visible on the trading screen until the quantity entered is completely filled, at which time the display of that specific working quantity will be removed from the working quantity column, or the order is canceled or deleted. In one embodiment of the invention, the cell in which the working quantity is displayed includes a 'W' followed by a value that indicates the quantity that is currently working in the market. The cell also contains a 'B' or an 'S' followed by a value that indicates how much of the original working Buy or Sell quantity has been bought or sold. Although

described with reference to a working quantity column, the embodiments are not limited to trading interfaces that display working quantities in a column, but rather the teachings of this section may be applied to any type of display of working quantities.

[00163] In one preferred embodiment of drag and drop, nothing changes with respect to a user's pending working orders until the user releases the mouse button, keypad or other input device over the desired location on the trading interface. This feature allows the user to maintain his/her place in the trading queue for the earlier entered order. In an alternative embodiment, the new order is entered as soon as the mouse icon comes to rest in an appropriate area of the trading interface.

[00164] Another alternative embodiment allows drag and drop of working quantities when price consolidation is enabled. Any appropriate algorithm may be used to allocate the new order(s) over the consolidated price range. For this embodiment, the user preferably may select, such as through the use of a dialog box, the desired allocation algorithm. For example, all the "dropped" orders may be entered at one price, such as the price shown on the consolidated scale, or the working quantity may be equally distributed over the consolidation range associated with the location where the orders are dropped, or each working order may be moved by the increment on the consolidated price scale between their original location and the location at which the orders are dropped.

[00165] Yet another alternative provides a user with the ability to enable automatic modification of the quantity of the order entered at the location where the working order is dropped. For example, as noted above, working orders may remain working until the input device (e.g. mouse button) is released. In this case, a working order may be filled or partially filled during the drag and drop process. Preferably, the user may select, such as through a dialog box, what will happen to the "dropped" order in this situation. For example, if the working order is filled during drag and drop, the user may prefer that no new order be entered at the new price. Or, if the working quantity is partially filled, the user may prefer that only the remaining quantity be entered at the new price. In this

manner, the “dropped” order may be automatically modified in accordance with user preference.

[00166] Average Price of Working Quantities

[00167] In accordance with a preferred embodiment, a display shows the average price for a trader’s working buy and sell quantities that are entered in the market. A trader’s working quantities represent the unfilled quantities of all the orders that the trader currently has entered, but not filled in the market. Preferably, the display shows the average price of the total working buy quantities and the average price of the total working sell quantities for the specific commodity being traded and for the specific trader who entered those quantities. For this embodiment, the average working prices may be displayed using, for example, highlighting, color, or a graphical indicator associated with a static price scale or axis, if such a scale or axis is displayed. The display may or may not include the actual numerical value of the average price.

[00168] In an alternate embodiment, a distribution of the prices for the trader's working buy and/or sell quantities that are entered in the market is displayed. In this alternative embodiment, the average price might also be displayed in or around the displayed distribution of the prices. It should also be understood that the average price and/or the distribution of prices may be displayed in a text format, displayed in a color format (e.g., a color indicator), displayed in a graphical format (e.g., using text and color), and so on.

[00169] For example, FIG. 18 shows a screen for a trader who has two working buy quantities at the market price of 96, eight working buy quantities at a price of 95, and two working buy quantities at a price of 94 (1800). Preferably, the average price of those working buy quantities is calculated by dividing the total price of the working quantities from the sum of the quantities and that average will be displayed as described below. In the preferred embodiment, the average price of the working buy quantities is calculated as follows (although, the average

price may be calculated using other known types of statistical and/or numerical analysis):

[00170] Total Price of Working Buy Quantities / Total Buy Quantity = Average Price of Working Buy Quantities:

$$((2 \times 96) + (8 \times 95) + (2 \times 94)) / (2 + 8 + 2) = 95$$

$$(192 + 760 + 188) / 12 = 95$$

$$1140 / 12 = 95$$

[00171] Preferably, the same calculation is utilized to determine the average price of the working sell quantities. Using the illustration from the example above, FIG. 18 also shows a screen for a trader who has four separate working sell quantities at the market price of 101, two working sell quantities at a price of 100, and four working sell quantities at a price of 99 (1802). The average price of the working sell quantities are displayed as described herein and that price is calculated as follows:

[00172] Total Price of Working Sell Quantities / Total Sell Quantity = Average Price of Working Sell Quantities:

$$((4 \times 101) + (2 \times 100) + (4 \times 99)) / (4 + 2 + 4) = 100$$

$$(404 + 200 + 396) / 10 = 100$$

$$3005 / 10 = 100$$

[00173] Preferably, the calculation of the average price of the working quantities is on a contract-to-contract basis, meaning that separate average prices are calculated and displayed for each separate commodity in which the trader has working quantity entered.

[00174] Preferably, the display of the average price and/or distribution of prices of a trader's working buy and sell quantities can be used to compare the trader's average price against all other current buy and sell quantities entered in the

market for the commodity. This function can benefit a trader by helping to ensure that the trader is trading at the most desirable prices.

[00175] In the preferred embodiment, the display of the average price for a trader's working quantities appears as two separate cells within the display – one displaying the average buy price 1804 of the trader's working sell quantities and the other the average sell price 1806 of the trader's working buy quantities. In the preferred embodiment, the average buy price is displayed at the bottom of the working quantities column and the average sell price 1806 is displayed at the top of that column, as shown in FIG. 18. Moreover, in the preferred embodiment, the price in the average sell price cell is highlighted in red and the price in the average buy price cell is highlighted in blue. Although, it should be understood that the average sell price and the average buy price can be displayed anywhere on the screen, and the average sell price and average buy price may be displayed textually, in any color, both textually and in a color, and so forth.

[00176] **Coding of Blank Spots**

[00177] In accordance with a preferred embodiment, cells in the buy and sell columns of the display that correspond to prices at which there is no quantity entered in the market are visually distinguished from those cells at which such quantity is entered. The buy and sell price levels for which there is not corresponding quantities are designated as "blank spots" 2000, and in the preferred embodiment appear in a different shade than populated cells as a means of providing a better visual representation of where the market is trading, as shown in FIG. 20A. The blank spots 2000 may appear in a lighter shade or darker shade than populated cells, a different color, or a different texture such as hatching from those cells where there is quantity entered. Preferably, as new quantities are entered into the market, and existing quantities are filled and removed from the market, the blank spots 2000 change accordingly. In addition, it is preferable that the user be able to select the manner in which blank spots are displayed.

[00178] According to an embodiment, a trader may benefit in that the visual difference between buy and sell cells that contain quantity, verses those that do not contain quantity, makes it easier for the trader to quickly recognize whether quantities are available in the market at a particular price. Thus, a trader interested in buying quantity has an enhanced display of where such quantity is available, and a trader interested in selling quantity can more easily gauge where other traders are selling the commodity.

[00179] In the preferred embodiment, color coding may appear in the buy and sell columns of the display at price levels at which there is no quantity currently in the market. The buy and sell cells that correspond to these price levels appear in a visually different manner than those cells at which such quantity is entered. Color coding may be enabled through a 'Color Code Blank Spots' field of an 'Options' display, shown in FIG. 20B, by checking the box 2002 immediately to the left of the blank spots option.

[00180] In another preferred embodiment, color coding and/or shading may be applied not only to cells without quantity, but also to cells in which the quantity falls below a threshold. Preferably, the threshold may be set by a user or an administrator. In addition, the user may set different thresholds either within one trading window or across multiple trading windows. When different threshold levels are utilized, it is preferable that each threshold value be assigned a distinct color so that the user may quickly recognize the meaning of the color coding.

[00181] **Display of Net Price of Open Position**

[00182] In accordance with a preferred embodiment, a trader is provided with a display of the net price of the working buy and sell orders. A visual indicator such as text, color, a combination of text and color, or a graphical indicator is used to highlight to the trader the net price of working buy and sell orders. The graphical indicator may take any form, including a line or even a colored pixel.

[00183] In one embodiment, it may be useful to display the net price open position, where a position is the difference between the number of orders bought (a long position) and the number of orders sold (a short position). A trader's

position is open when the number of orders bought or sold is not equal. If these orders are equal, the trader's position is considered closed. When orders are traded on an exchange, it is possible for a trader to receive multiple fills, for multiple quantities, and at different price levels for the quantities that make up the trader's orders. This feature incorporates the price levels of these multiple fills to determine the net price at which the fills occurred. The trader can then use this net price to gauge whether trading out of a position would result in a realized gain, loss, or scratch (neither a gain nor a loss).

[00184] To determine the net price of a trader's open position, this embodiment divides the total price of the quantity that has been filled by the total number of orders either bought or sold (a.k.a. the trader's current position). For example, a trader who purchased 10 contracts of a commodity (4 @ 99, 2 @ 100, and 4 @ 101) would have a long 10 position, meaning that the trader would need to sell 10 contracts in order to close the trader's position. The net price of the trader's filled quantity would be 100, and would be calculated as follows:

[00185] Total price of Filled Quantity/Current Position = Net Price of the Open Position

$$(4 @ 99 + 2 @ 100 + 4 @ 101) / 10 = 100$$

$$(396 + 200 + 404) / 10 = 100$$

$$(1000) / 10 = 100$$

[00186] Based on the calculation above, the value of 100 is displayed as the trader's net price of the trader's open position. The net price can be displayed in one of several manners, which include, without limitation, a box around the net price's price level cell as shown in FIG. 21, a separate column for the display of the net price, a box across the net price's price level, or a distinguishing color for the net price. If a particular trader has a long position as the result of buying quantity, any additional quantity that is bought will cause the net price of the trader's open position to be re-calculated. Preferably, should that trader sell quantity, the trader's position will change but the net price that is displayed will remain constant. Any additional buy quantity will subsequently change both the trader's position and the net price of that position, while all subsequent sell

quantity will adjust the trader's position only, and will do so only until the position is closed. Should a trader begin a trading session with a short position as a result having the sell quantity(s) filled, all of the trader's subsequent sell quantity will change both the position and the net price of the trader's open position when such sell quantity is filled. Any buy quantity that has been filled will not change the net price, but will instead affect only the position and only until that position has been closed. As a result, it will be easier for a trader to gauge where (at what price) the trader needs to buy or sell when the net price of the trader's long position is only allowed to increase as the position increases and the net price of the short position is only allowed increase as the position becomes shorter.

[00187] A trader may benefit in that the visual representation of the net price of the trader's open position reduces or eliminates the need to mentally calculate such a price when, depending on the market's volatility, the price may change repeatedly. A trader who has had consecutive buy quantities filled will have a long position and will see a display signifying the net price of that long position. Any sell quantities that are filled will not be calculated into that net price.

Likewise, a trader who has consecutive sell quantities filled will have a short position and will see a display signifying the net price of that short position. Any buy quantities that are filled will not be calculated into that net price. The trader benefits from such a feature in that the trader will always have a display of the net price of the trader's primary position (either of all of the trader's buy quantities or all of the trader's sell quantities), which will therefore provide the trader with a better indication of the price level at which the trader needs to buy or sell additional quantities to make a profit and close the position. Alternatively, the average price of the trader's open position may be calculated based upon both buy and sell orders filled.

[00188] The marker indicating the net price may be anything that is suitable to serve as an indicator for the trader, including, for example, graphical symbols, numbers and/or colors. Thus, although FIG. 21 shows a cell 2100 surrounded by a colored, shaded or highlighted box, the marker may alternatively be graphical, or numerically displayed elsewhere on the user interface. It is not necessary that

the marker occupy an entire cell. For example, in instances where the trading interface includes a static price scale, and the price scale is consolidated, it may be desirable to locate the marker at a position within a cell that corresponds to a specific price. Preferably, the type of marker is selectable by the user.

[00189] Consolidation Control Icon

[00190] In accordance with a preferred embodiment, a trader may consolidate price information, or other useful information, by a control icon that is displayed to the user on the same interface that is used for trading. Consolidation of price information is described in U.S. Patent Application No. 09/971,087, incorporated above. In the embodiment described herein, the control icon is preferably presented to the user on the same screen that is used for trading, thereby allowing the user to maintain his or her view of the market information as the control icon is adjusted.

[00191] In a preferred embodiment, the control icon is a slide control 2200, shown in FIG. 22, which can be dragged from left-to-right or right-to-left, but in alternate embodiments may include a dial that can be turned in the clockwise or counter-clockwise direction or any other control icon that may be actuated through the graphical user interface of the trading application. According to the preferred embodiment where price information may be consolidated through the slide control 2200, when the slide control 2200 is dragged to the far left, the display presents numbers in a one-tick, or uncompressed, progression. Price information may also be displayed in another manner besides ticks (such as currency), depending on the manner in which each exchange provides the price information and user's preferences. As the slide control 2200 is moved to the right, the control consolidates the prices and any other associated values (e.g., bid/ask quantities, working orders, etc.), thereby displaying values that become progressively more consolidated the further the slide control 2200 is moved to the right, and resulting in the display of prices in multiples of ticks. Preferably, each increment of the control icon may be selected by the user, such as through a dialog box or any other means known to those skilled in the art.

[00192] Although described with reference to a vertical price scale that is subject to consolidation, the preferred embodiments are not limited to consolidating a price scale, nor are they limited to consolidating a vertical display element. Rather, any numerical sequence is subject to consolidation, regardless of its orientation or number of dimensions. The preferred embodiments allow user selectable consolidation through an icon presented on the user interface.

[00193] The consolidation of price information by adjusting a control icon benefits a trader in that it quickly allows for a greater number of prices and/or associated values such as bid/ask quantities and working orders to be displayed at any given time. Thus, a trader has a greater chance of not only seeing a majority, if not all, of the quantity entered at those prices, but the trader also has a greater spectrum of prices in which to enter the trader's own quantities.

[00194] **Conclusion**

[00195] It should be understood that the above description of the preferred embodiments, alternative embodiments, and specific examples are given by way of illustration and not limitation. For example, the features described herein could be incorporated into a variety of displays. Many changes and modifications within the scope of the present embodiments may be made without departing from the spirit thereof, and the present invention includes all such changes and modifications.

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We Claim:

1. A method for automatically positioning information related to a commodity on a graphical user interface, the method comprising:

receiving market information relating to the commodity from an electronic exchange, the market information comprising a plurality of items of interest, each item of interest associated with a price;

displaying an information display region comprising a plurality of locations arranged such that each location corresponds to a price level along at least a portion of a static price axis;

displaying a plurality of indicators at a first time, each indicator associated with an item of interest and each indicator being displayed in one of the plurality of locations in the information display region corresponding to a price level that is associated with the item of interest; and

automatically repositioning the static price axis upon detecting a predetermined condition such that the plurality of locations of the information display region corresponds to a different portion of the static price axis at a second time;

wherein each of the plurality of indicators is moved to a new location in the information display region that corresponds to the price level on the static price axis that is associated with that indicator.
2. The method of claim 1 wherein the predetermined condition comprises a time period defining a time between each automatic repositioning.
3. The method of claim 1 further comprising the step of selecting a particular item of interest as a basis for repositioning wherein the step of automatically repositioning further comprises repositioning the static price axis such that the price level associated with the particular item of interest corresponds to a particular location of the information display region at the second time.
4. The method of claim 3 wherein the predetermined condition is associated with the particular location in the information display region in which the indicator associated with the particular item of interest is displayed.
5. The method of claim 3 wherein the particular item of interest comprises a highest bid price for the commodity available in the market.

6. The method of claim 5 wherein the predetermined condition is associated with the particular location in the information display region in which the indicator associated with the particular item of interest is displayed.
7. The method of claim 3 wherein the particular item of interest comprises a lowest ask price for the commodity available in the market.
8. The method of claim 7 wherein the predetermined condition is associated with the particular location in the information display region in which the indicator associated with the particular item of interest is displayed.
9. The method of claim 3 wherein the particular item of interest comprises a last traded price for the commodity.
10. The method of claim 9 wherein the predetermined condition is associated with the particular location in the information display region in which the indicator associated with the particular item of interest is displayed.
11. The method of claim 3 wherein the particular location of the information display region at the second time comprises a location positioned substantially in the center of the information display region.
12. The method of claim 1 wherein the information display region comprises a bid display region comprising a plurality of locations arranged such that each location corresponds to a price level along at least a portion of the static price axis at a first time and an ask display region comprising a plurality of locations arranged such that each location corresponds to a price level along the portion of the static price axis at a first time.
13. The method of claim 12 wherein the plurality of indicators comprises a first indicator representing quantity associated with a highest bid price currently available in the market and a second indicator representing quantity associated with a lowest ask price currently available in the market.
14. The method of claim 13 wherein the first indicator is displayed in one of the plurality of locations of the bid display region and wherein the second indicator is displayed in one of the plurality of locations of the ask display region.

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15. The method of claim 13 wherein the step of automatically repositioning results in the first and second indicators being displayed substantially in the center of the bid and ask display regions respectively.
16. The method of claim 13 wherein the step of automatically repositioning results in the location in the bid display region that is positioned substantially in the center of the bid display region to be corresponding to a price level that is associated with the midpoint between the highest bid price and the lowest ask price.
17. The method of claim 13 wherein the step of automatically repositioning results in the location in the ask display region that is positioned substantially in the center of the ask display region to be corresponding to a price level that is associated with the midpoint between the highest bid price and the lowest ask price.
18. The method of claim 13 wherein the step of automatically repositioning results in the price level associated with the last trade of the commodity corresponding to the locations of the bid and ask display regions that are positioned substantially in the center of the bid and ask display regions.
19. The method of claim 12 further comprising the step of displaying a last trade display region comprising a plurality of locations arranged such that each location corresponds to a price level along the portion of the static price axis at the first time.
20. The method of claim 19 wherein the plurality of indicators further comprises a last trade indicator associated a price level at which the commodity last traded.
21. The method of claim 20 wherein the last trade indicator is displayed in one of the plurality of locations of the last trade display region.
22. The method of claim 12 further comprising:

displaying a bid order entry region comprising a plurality of locations for receiving commands to send buy orders, the plurality of locations arranged such that each location corresponds to a price level along the portion of the static price axis at the first time; and

displaying an ask order entry region comprising a plurality of locations for receiving commands to send sell orders, the plurality of locations

arranged such that each location corresponds to a price level along the portion of the static price axis at the first time.

23. The method of claim 22 wherein the bid order entry region overlaps with the bid display region and the ask order entry region overlaps with the ask display region.
24. The method of claim 22 further comprising sending a buy order relating to the commodity to the electronic exchange based on an action of a user input device which selects a particular location in the bid order entry region.
25. The method of claim 22 further comprising sending a sell order relating to the commodity to the electronic exchange based on an action of a user input device which selects a particular location in the ask order entry region.
26. The method of claim 1 wherein the predetermined condition is associated with the particular location in the information display region in which an indicator associated with a particular item of interest is displayed.
27. The method of claim 26 wherein the predetermined condition is further associated with the particular location relative to a location located substantially in the center of the information display region.
28. The method of claim 26 wherein the predetermined condition is further associated with the particular location relative to the location of the information display region corresponding to the highest price level in view.
29. The method of claim 26 wherein the predetermined condition is further associated with the particular location relative to the location of the information display region corresponding to the lowest price level in view.
30. The method of claim 26 further comprising the step of displaying at least a portion of the common static price axis.
31. A computer readable medium having stored therein instructions to execute the method of claim 1.
32. A method for automatically re-positioning market information relating to a commodity on a graphical user interface, the method comprising:

displaying a plurality of items of interest comprising market information in relation to a static scale in a trading interface;

identifying at least one item of interest from the plurality of items of interest as a basis for automatically positioning the plurality of items of interest;

updating the display on the trading interface as the market information changes, whereby one or more of the plurality of items of interest moves in relation to the static scale; and

automatically re-positioning the plurality of items of interest in response to the identified item of interest.

33. The method of claim 32, wherein the step of automatically re-positioning the plurality of items of interest comprises moving the static scale and the plurality of items of interest when the identified item of interest moves to a predetermined location in the trading interface.
34. The method of claim 32, wherein the step of automatically re-positioning the plurality of items of interest comprises moving the static scale and the plurality of items of interest when a timer reaches a predetermined time.

ABSTRACT

[00196] A method for automatically positioning information related to a commodity on a graphical user interface. Market information is displayed on the graphical user interface. The market information may be presented as a number of indicators, corresponding to particular items of interest, that are associated with a static scale. The scale may, for example, represent price. Upon detecting a predetermined condition, the location of the market information is automatically repositioned.

FIG. 1

CONNECTION TO MULTIPLE EXCHANGES

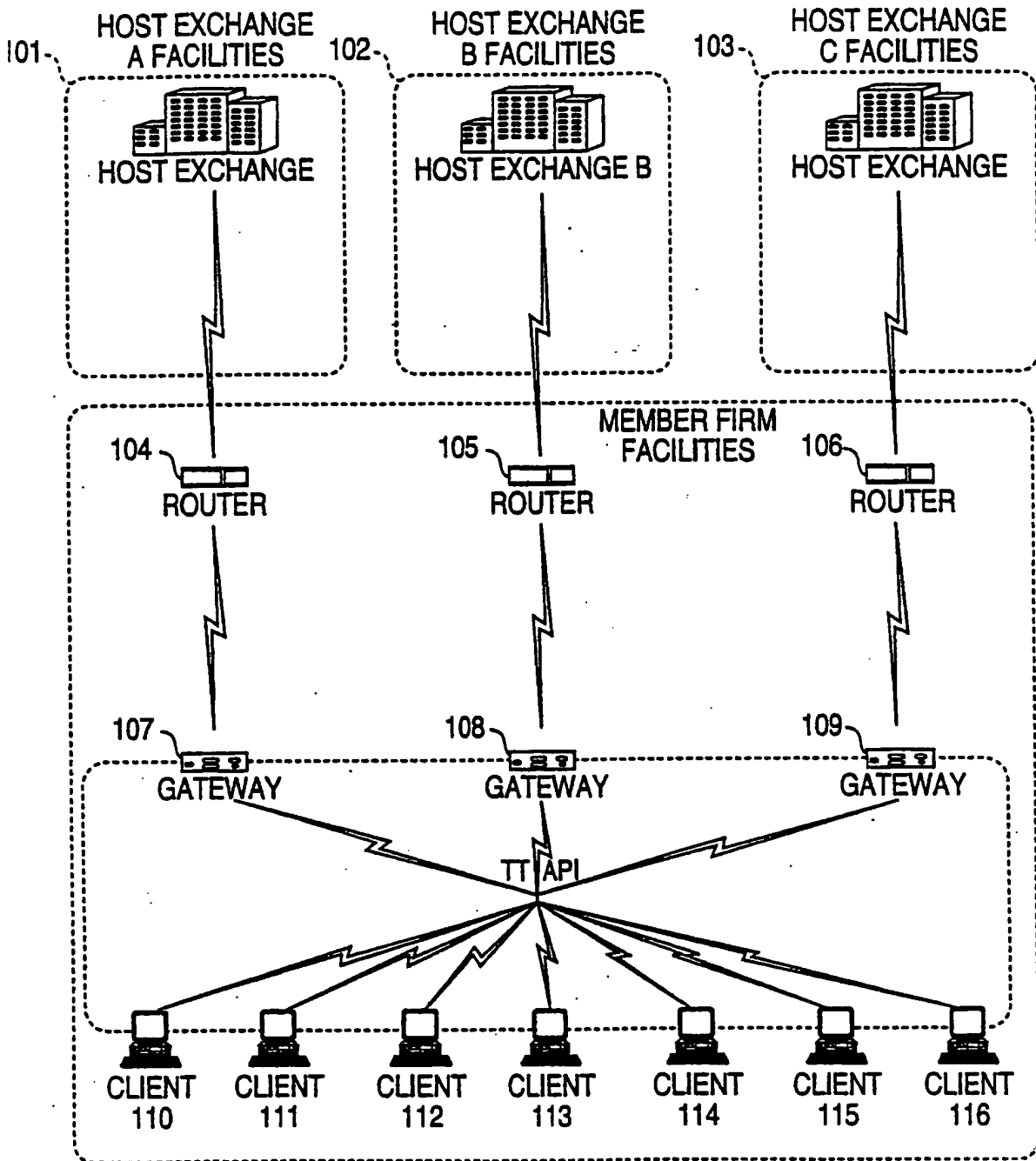


FIG. 2

	Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total
1	CDHO	•	785	7626	7627	21	7627	489	8230
2			626	7625	7629	815			
3			500	7624	7630	600			
4			500	7623	7631	2456			
5			200	7622	7632	800			

201
202
203
204
205
206
207
208

FIG. 3

SYCOM FGBL DEC99							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E/W	10:48:44		BidQ	AskQ	Prc	LTQ				
318	L	3		104	99					
320	R	5		24	98					
322	720			33	97					
324	X	10		115	96					
326	0			32	95					
328	10	1H		27	94					
312	S 0 W 24	1K 5H		63	93					
	S 0 W 7	CLR		45	92					
330	X	10		28	91					
332	17	▼		20	90	10	306			
314	B 0 W 15	CXL	18		89					
	B 0 W 13	+ -	97		88					
334	NET 0		30		87					
336	B 0 W 17	NET REAL	43		86					
338			110		85					
342			23		84					
			31		83					
			125		82					
			21		81					

FIG. 4

SYCOM FGBL DEC99						<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
E/W	10:48:44		BidQ	AskQ	Prc	LtQ		
	L	3		104	99			
	R	5		24	98			
	720			33	97			
	×	10		115	96			
	0			32	95			
	10	1H		27	94			
	50	3H		63	93	10	} 400	
S 10 W 14	1K	5H		43	92			
	CLR			125	91			
	×	10		97	90			
	17	▼		18	89			
B 0 W 15	CXL			97	88			
B 0 W 13	+	-		30	87			
	NET 0			43	86			
B 0 W 17	NET REAL			110	85			
				23	84			
				31	83			
				125	82			
				21	81			

FIG. 5

SYCOM FGBL DEC99						[-]	[+]	[X]
E/W	10:48:44		BidQ	AskQ	Prc	LTQ		
	L	3		104	99			
	R	5		24	98			
	720			33	97			
	X	10		115	96			
	0			32	95			
	10	1H		27	94			
	50	3H		63	93			
S 0 W 24	1K	5H		45	92			
S 0 W 7	CLR			28	91			
	X	10		20	90	10		
	17	▼		18	89			
BO W 17	CXL		18		89			
BO W 13	+	-	97		88			
BO W 5	NET 0		30		87			
BO W 15	NET REAL		43		86			
			110		85			
			23		84			
			31		83			
			125		82			
			21		81			

510

508

502

514

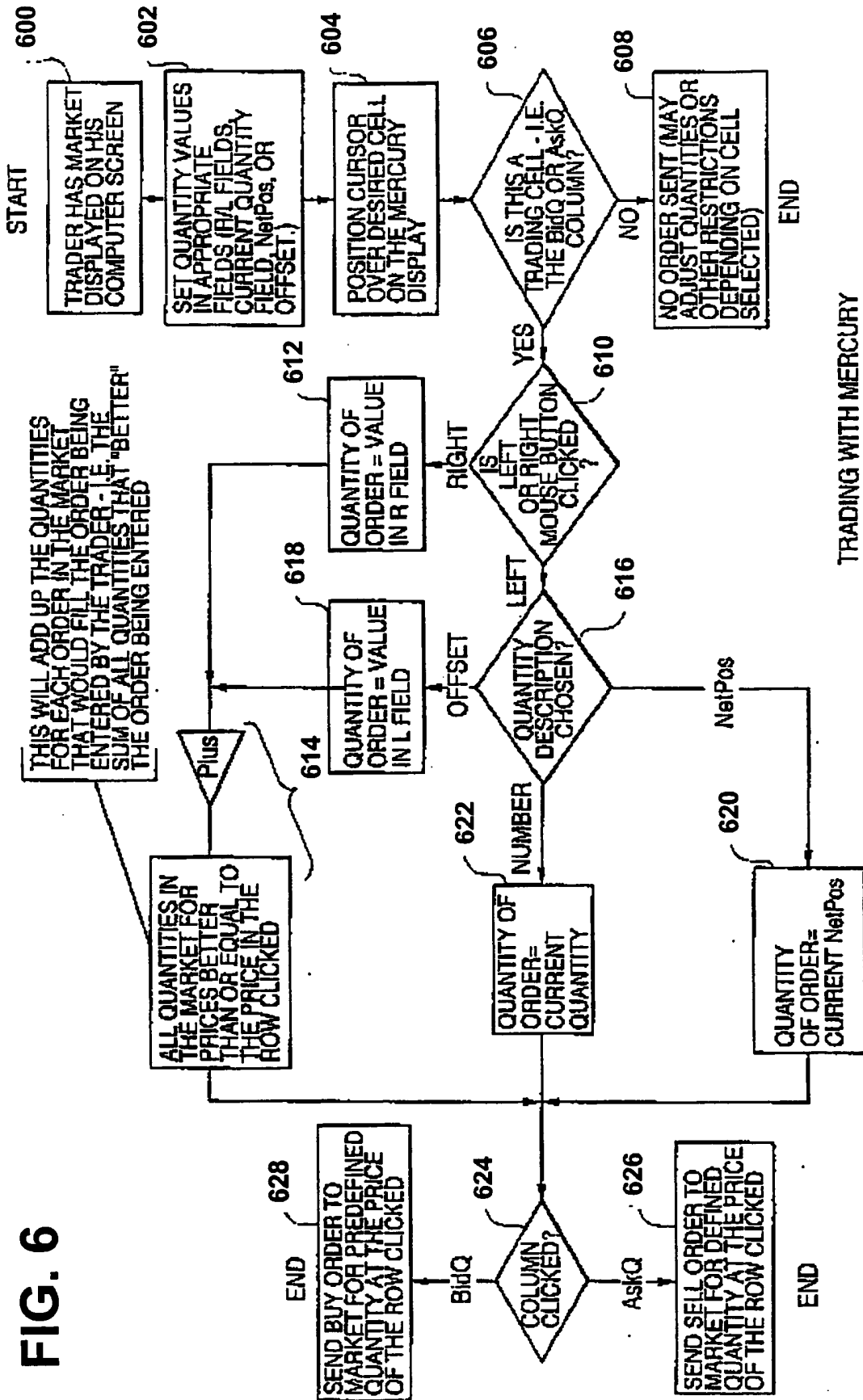
500

506

504

512

FIG. 6



700

FIG. 7

704 (Price Column)

702 (LTQ Column)

CME-S ES JUN02		14:58:34		A	
•1875				109475	
-Detail				109450	
4922				109425	
				109400	
1				109375	
1	5			109350	
10	20			109325	
50	100			109300	
CLR				109275	
1				109250	
SL	SM			109225	
<input type="checkbox"/>	IOC			109200	10
Del All				109175	
				109150	
				109125	
				109100	44
Trade Out				109075	
		74		109150	
		35		109025	
		103		109000	
		15		108975	
				108950	25
				108925	
				108900	
		3		108875	
				108850	
		1		108825	
				108800	
				108775	
				108750	
				108725	
				108700	

Previous LTQ Price 706

Blue Highlight signifies LTQ ticked upward from the previous LTQ price 710

Red Highlight signifies LTQ ticked downward from the previous LTQ price 712

708

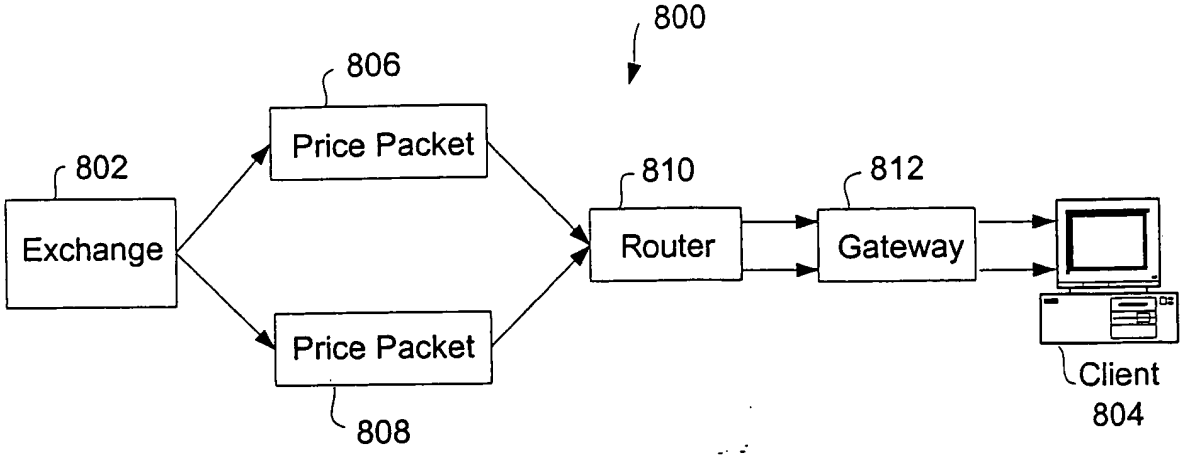


FIG. 8

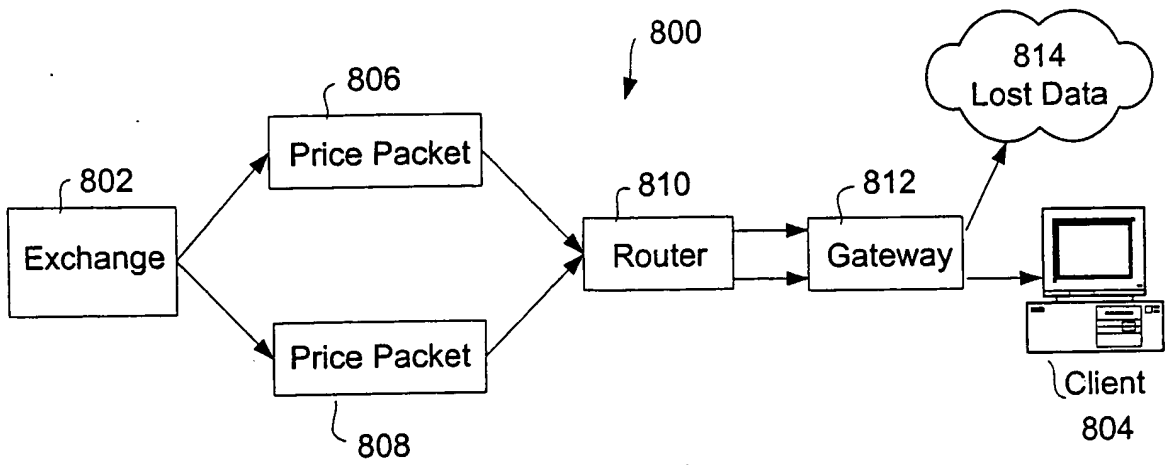


FIG. 9

FIG. 10

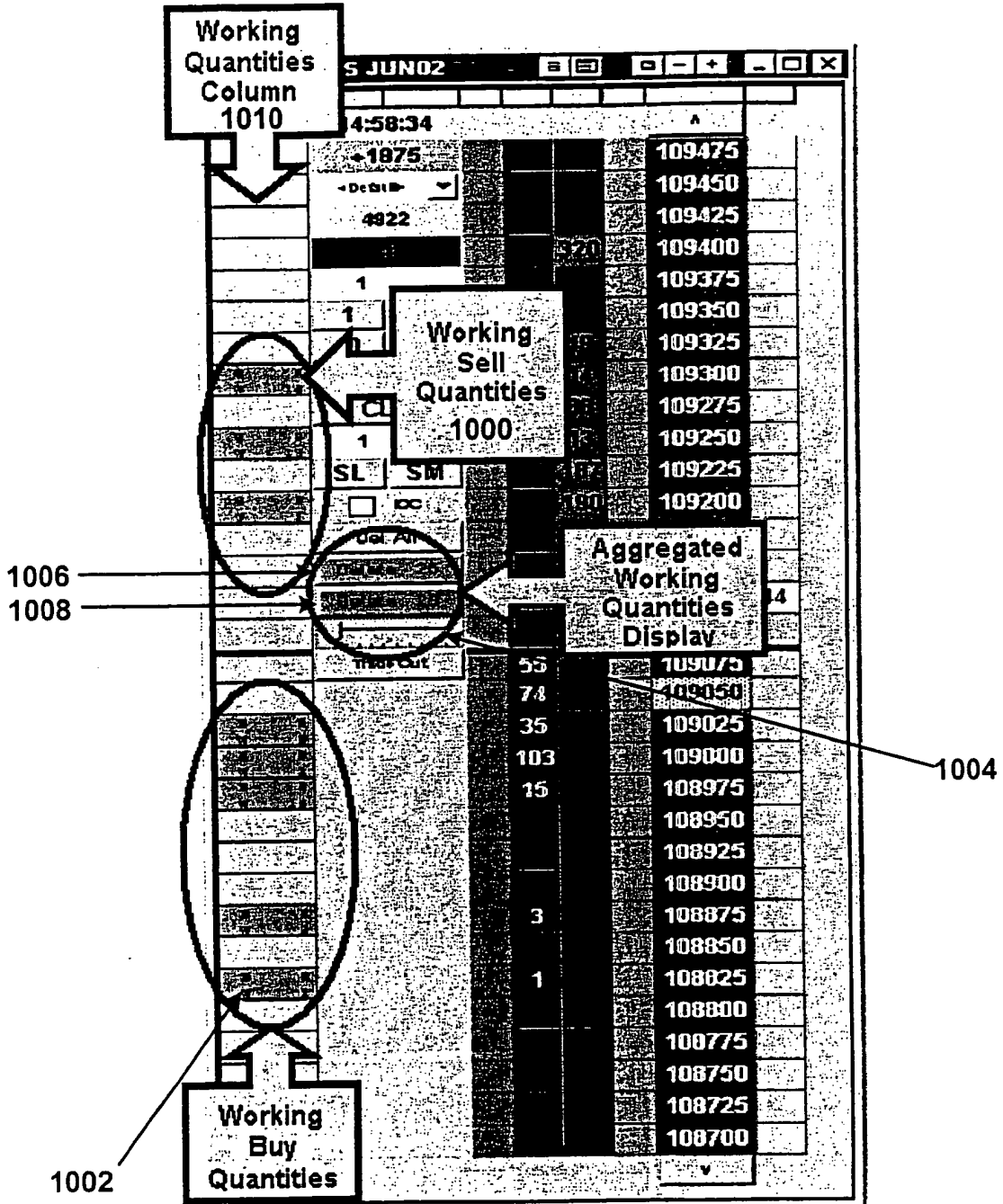
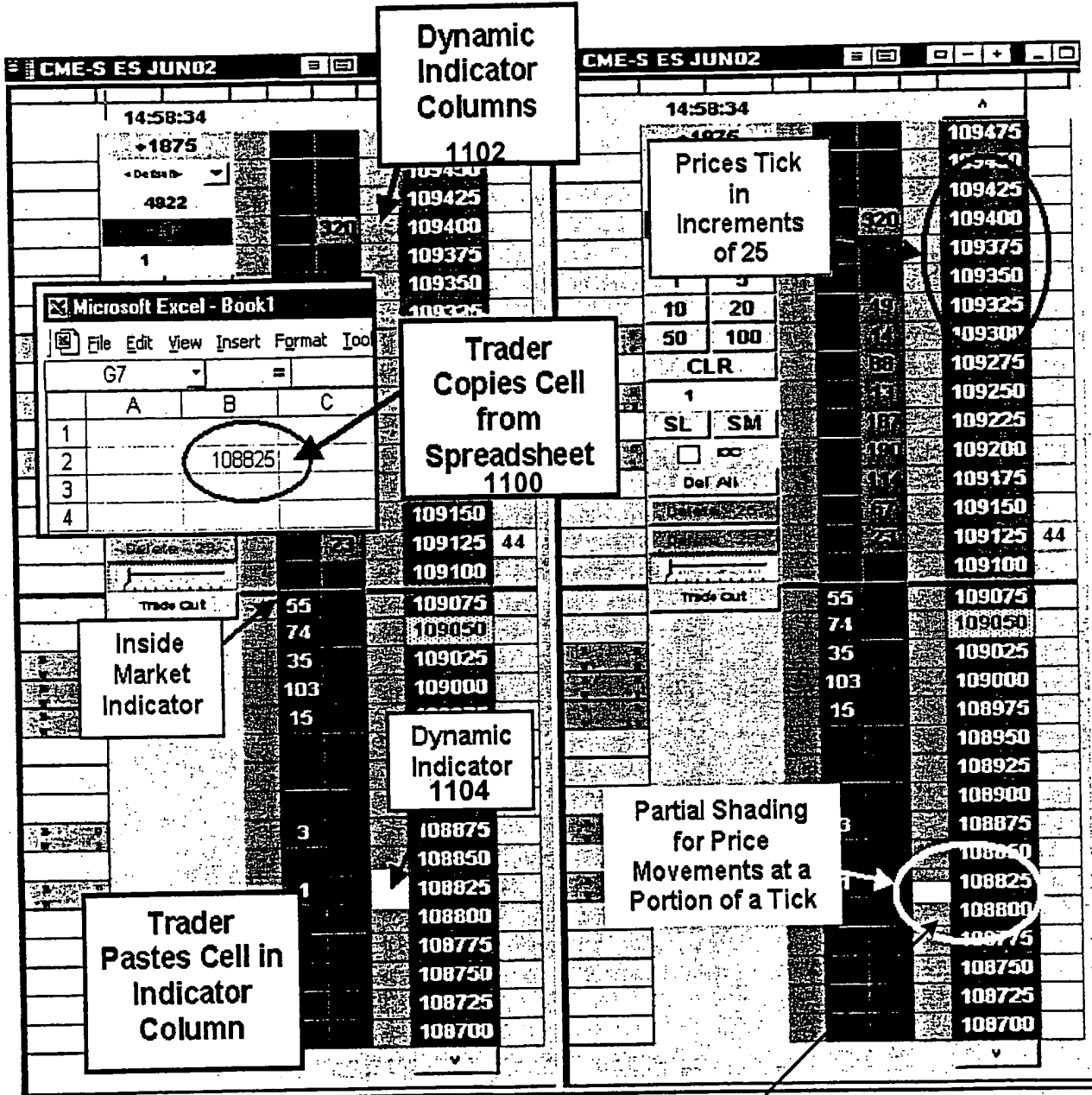


FIG. 11A

FIG.11B



1110

FIG. 12A

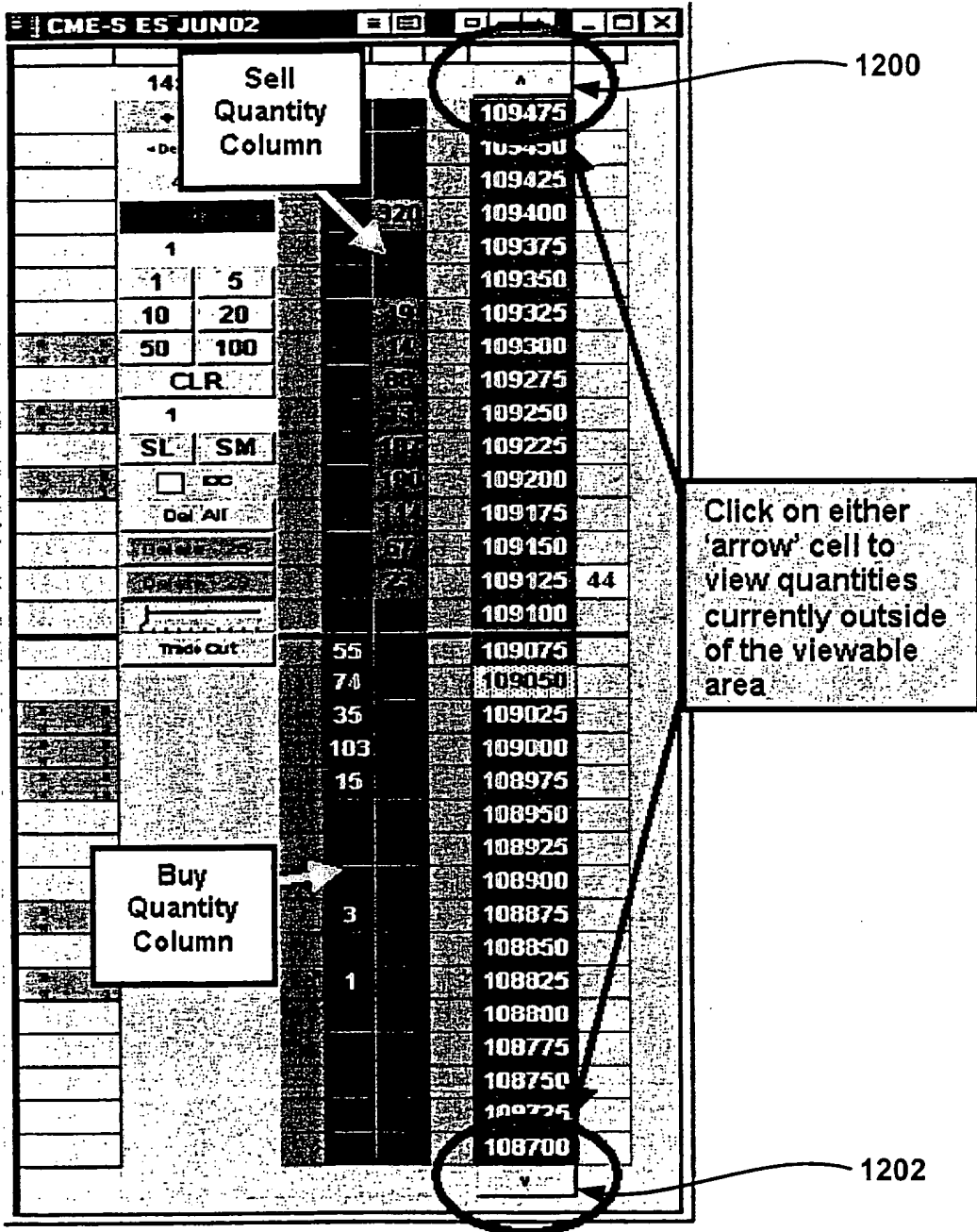


FIG. 12B

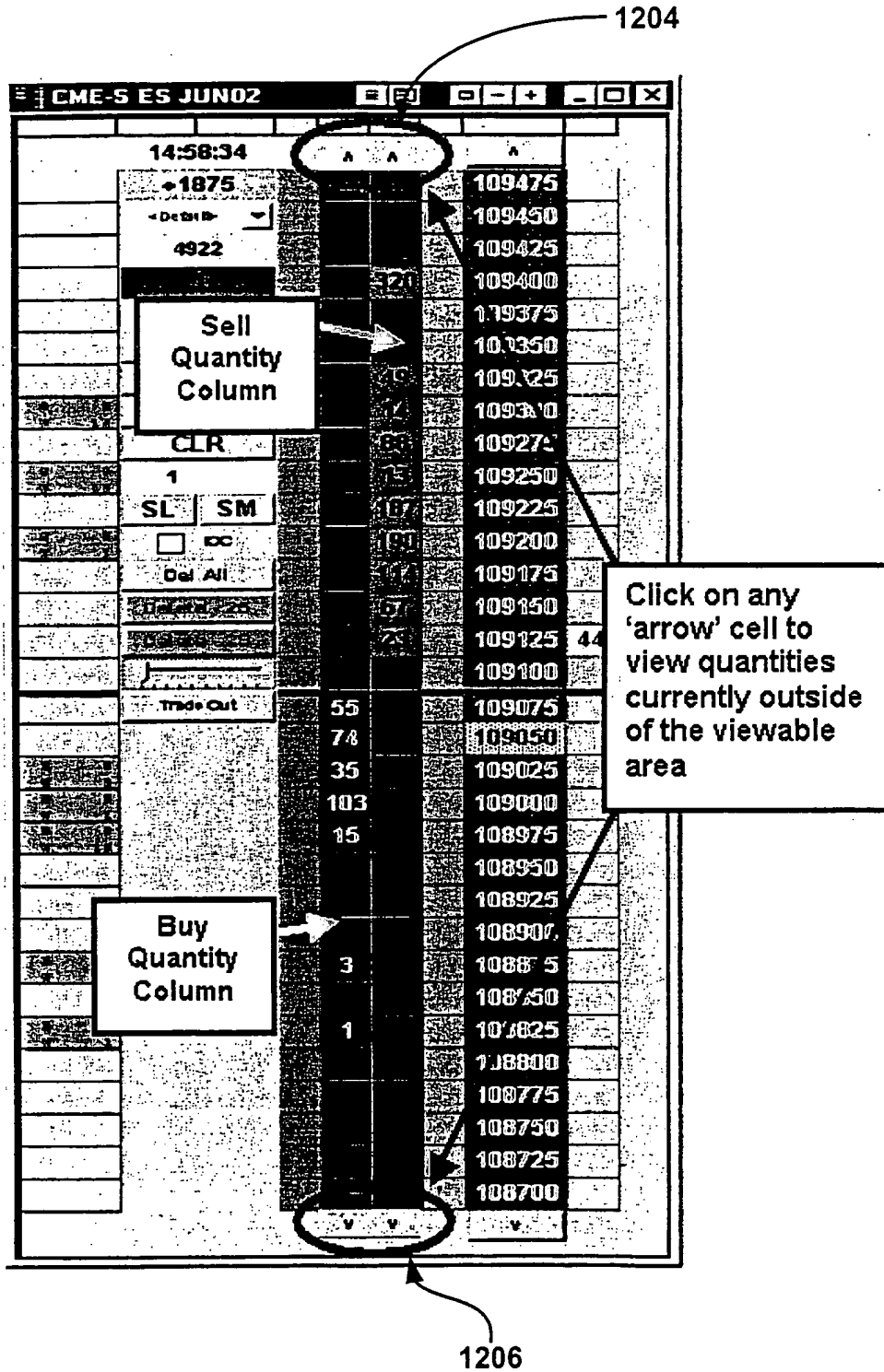


FIG. 13A

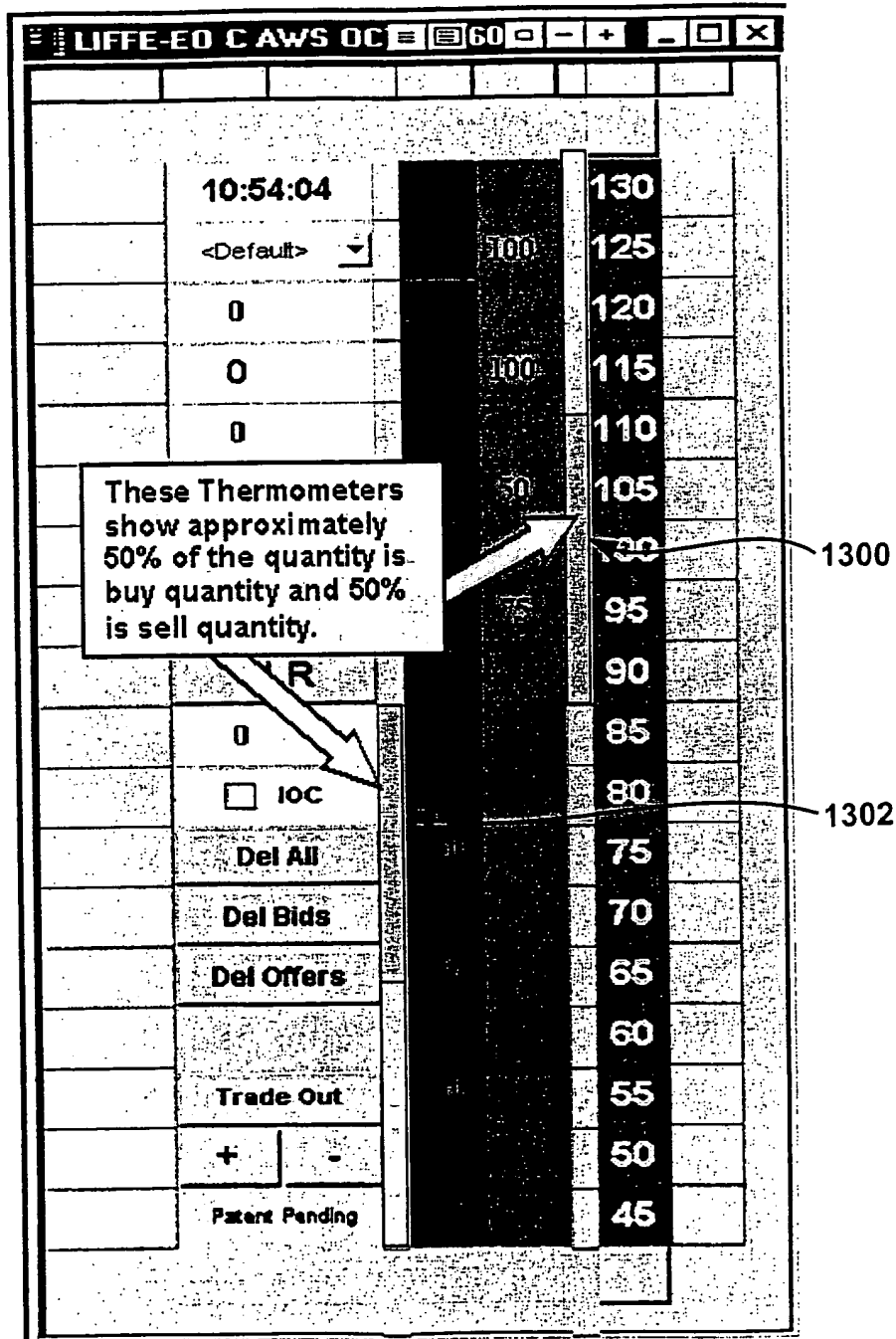


FIG. 13B

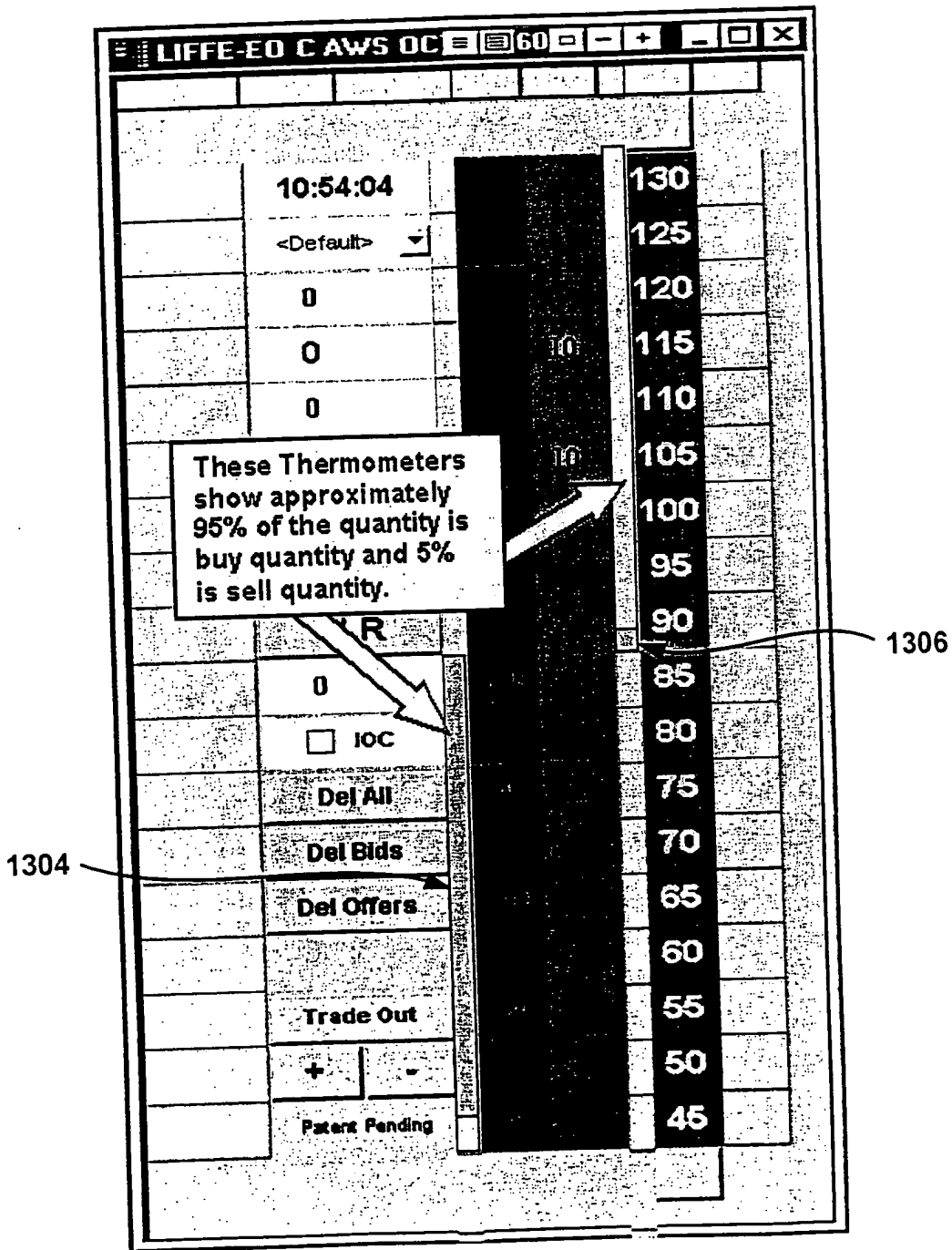


FIG. 14A

FIG. 14B

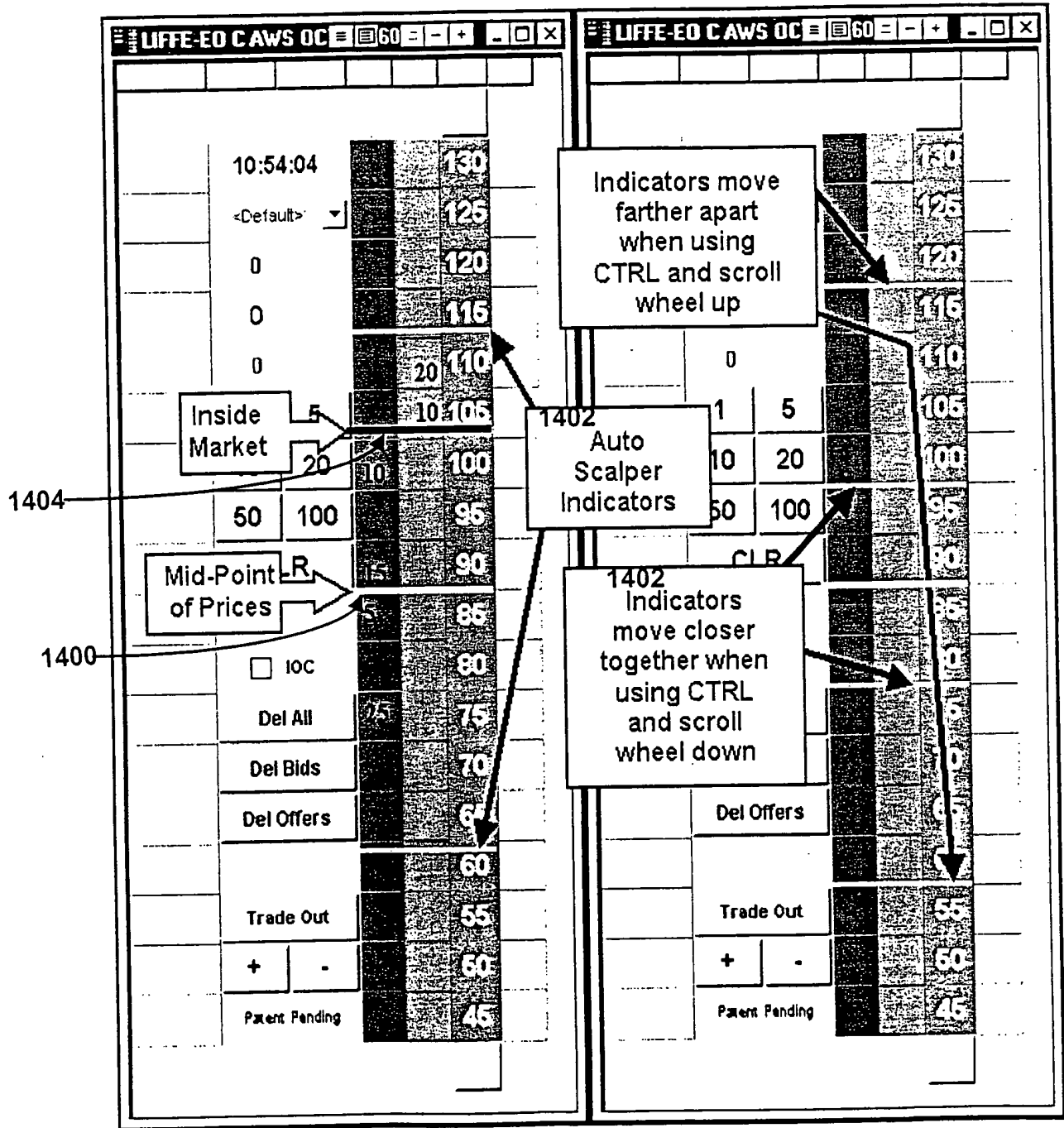


FIG. 15A

MD Trader Options for LIFFE-E AOL DECO1 [X]

GUI Options

- Show Tooltips
- Show Clock
- Show Customer Account Combobox
- Show IOC Checkbox
- Show Delete All Button
- Show TradeOut Button
- Show Bid Indicator Column
- Show Ask Indicator Column
- Color Code Blank Spots
- Keep MD Trader on Top
- Do "Delete All" when LTQ Column Clicked
- Do Sweep
- Left Button
- Allow only
- Use Inside
- Enable Ke
- Highlight N
- Enable Average Price
- Enable Drag/Drop of Working Orders
- Show Bid Text on Bid/Ask Column
- Price Reasonability Check [5]

Format

[5] # digits for Working/Exec.

[11] # digits for Price Display

Price Consolidation

[7] # Prices per line [5] Offset

Show Slider Control, Increment(Ticks) [5]

Order Parameters

[10000] Maximum Order Quantity

TradeOut Method

Using LIMIT Order: [5] # of ticks to skew

Using MARKET Order

Enable Automatic Grid Centering

Every [2] seconds

Last Traded Price Within [2] rows from top/bottom

Inside Market Within [2] rows from top/bottom

Enable Grid Recenter warning

Stop Orders

Enable Stop Market Orders

Enable Stop Limit Orders

Set Stop limit price [5] ticks from stop entry price

Display Delete Buttons/Working Quantity Totals

Display Working Buys/Sells - Text Only

Delete Total Working Buys/Sells - Quantity on Button

Delete Bids/Offers - Button Only

Display Working Buys/Sells as Text and Delete Bids/Offers as buttons

Check Box to Enable Price Level Reasonability Check

1500

1502

FIG. 15B

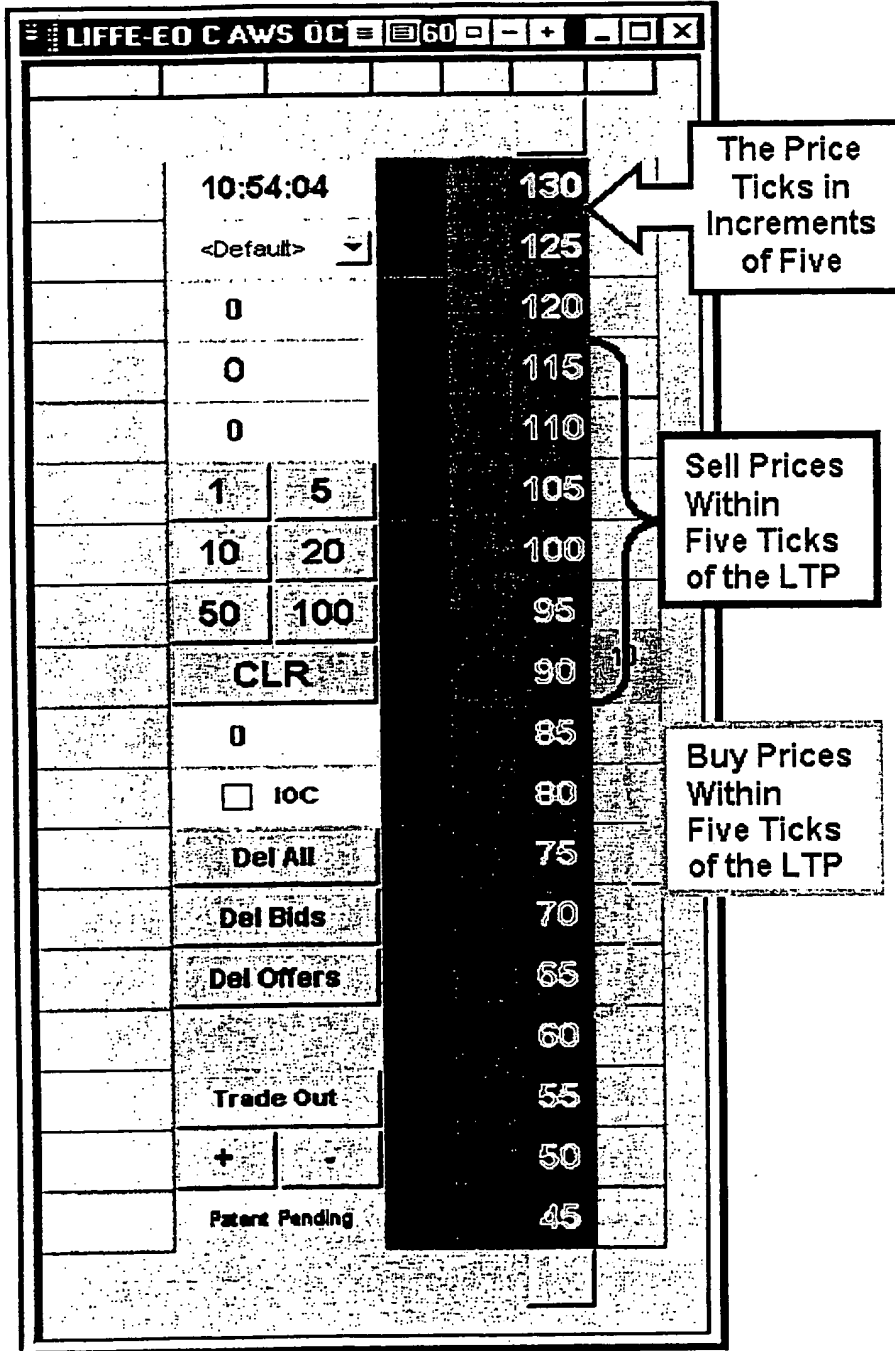


FIG. 16A

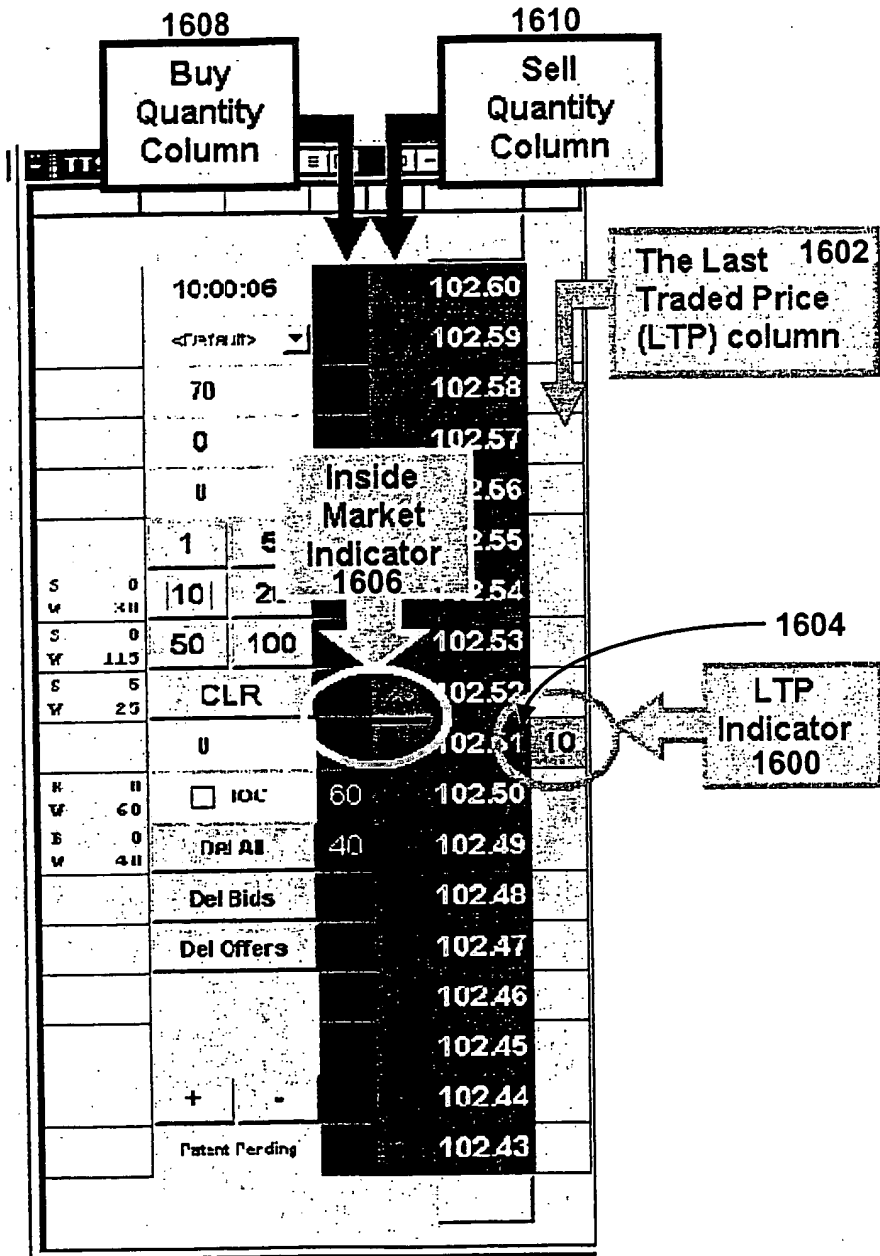


FIG. 16B

MD Trader Options for LIFFE-E AOL DEC01

GUI Options

- Show Tooltips
- Show Clock
- Show Customer Account Combobox
- Show IOC Checkbox
- Show Delete All Button
- Show TradeOut Button
- Show Bid Indicator Column
- Show Ask Indicator Column
- Color Code Blank Spots
- Keep MD Trader on Top
- Do "Delete All" when LTQ Column Clicked
- Do Sweep on Right Click
- Left Button actions on Mouse DOWN
- Allow only one order per side of market
- Use Inside Market Prices
- Enable Keyboard and Function Key Trading
- Highlight Midpoint of Last Recenter
- Enable Average Price
- Enable Drag/Drop of Working Orders
- Show Bold Text on Bid/Ask Column
- Price Reasonability Check : 5

Format

digits for Working/Exec. : 5

digits for Price Display : 11

Price O : 7

Offset (ticks) : 5

Order F : 10000

TradeOut Method

Using LIMIT Order : # of ticks to skew

Using MARKET Order

Enable Automatic Grid Centering

- Every 2 seconds
- Last Traded Price Within 2 rows from top/bottom
- Inside Market Within 2 rows from top/bottom
- Enable Grid Recenter warning

Stop Orders

- Enable Stop Market Orders
- Enable Stop Limit Orders
- Set Stop limit price : 5 ticks from stop entry price

Display Delete Buttons/Working Quantity Totals

- Display Working Buys/Sells - Text Only
- Delete Total Working Buys/Sells - Quantity on Button
- Delete Bids/Offers - Button Only
- Display Working Buys/Sells as Text and Delete Bids/Offers as buttons

Check Box to Enable Track Market / Automatic Grid Centering Feature

OK

Cancel

FIG. 17

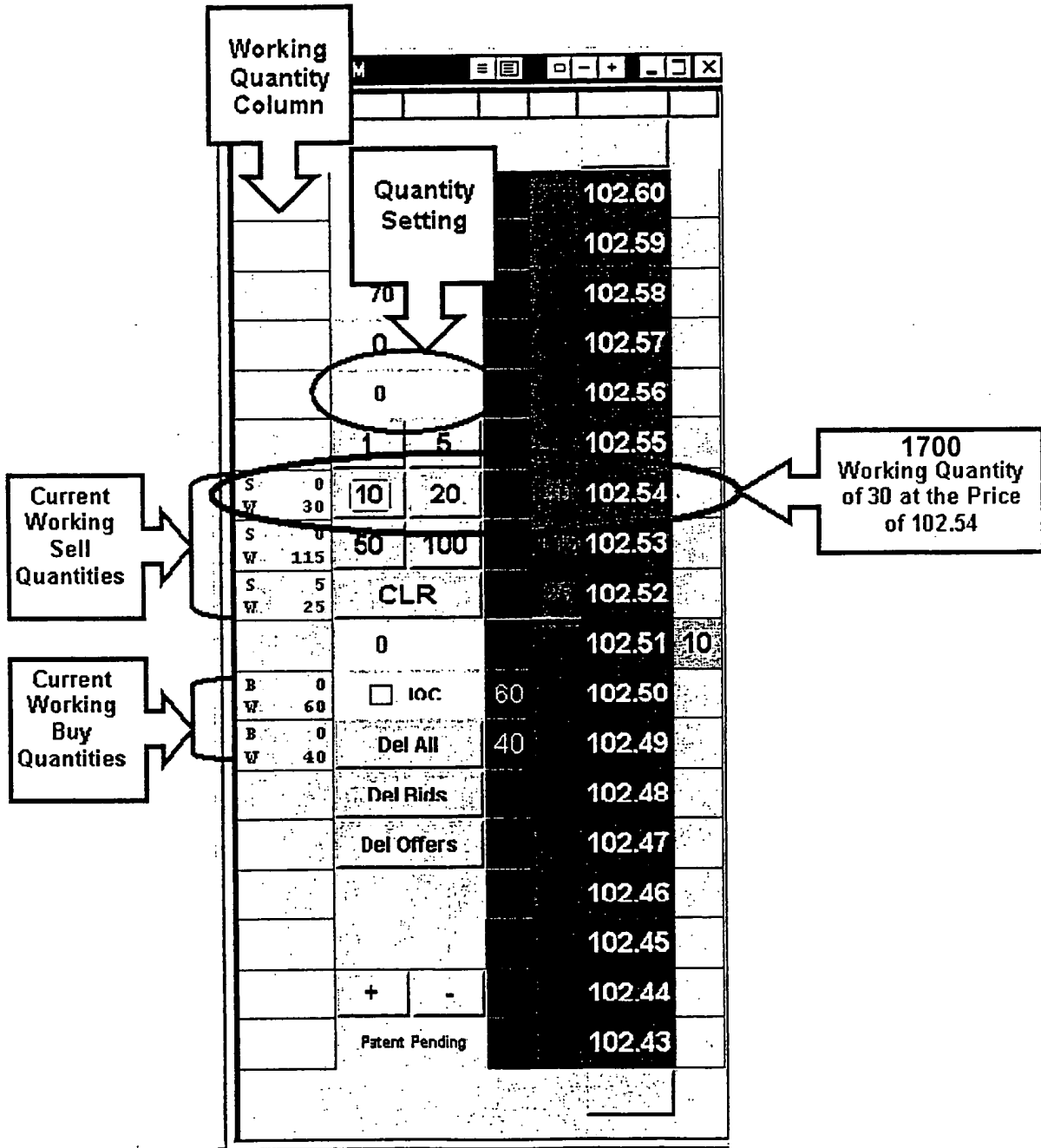


FIG. 18

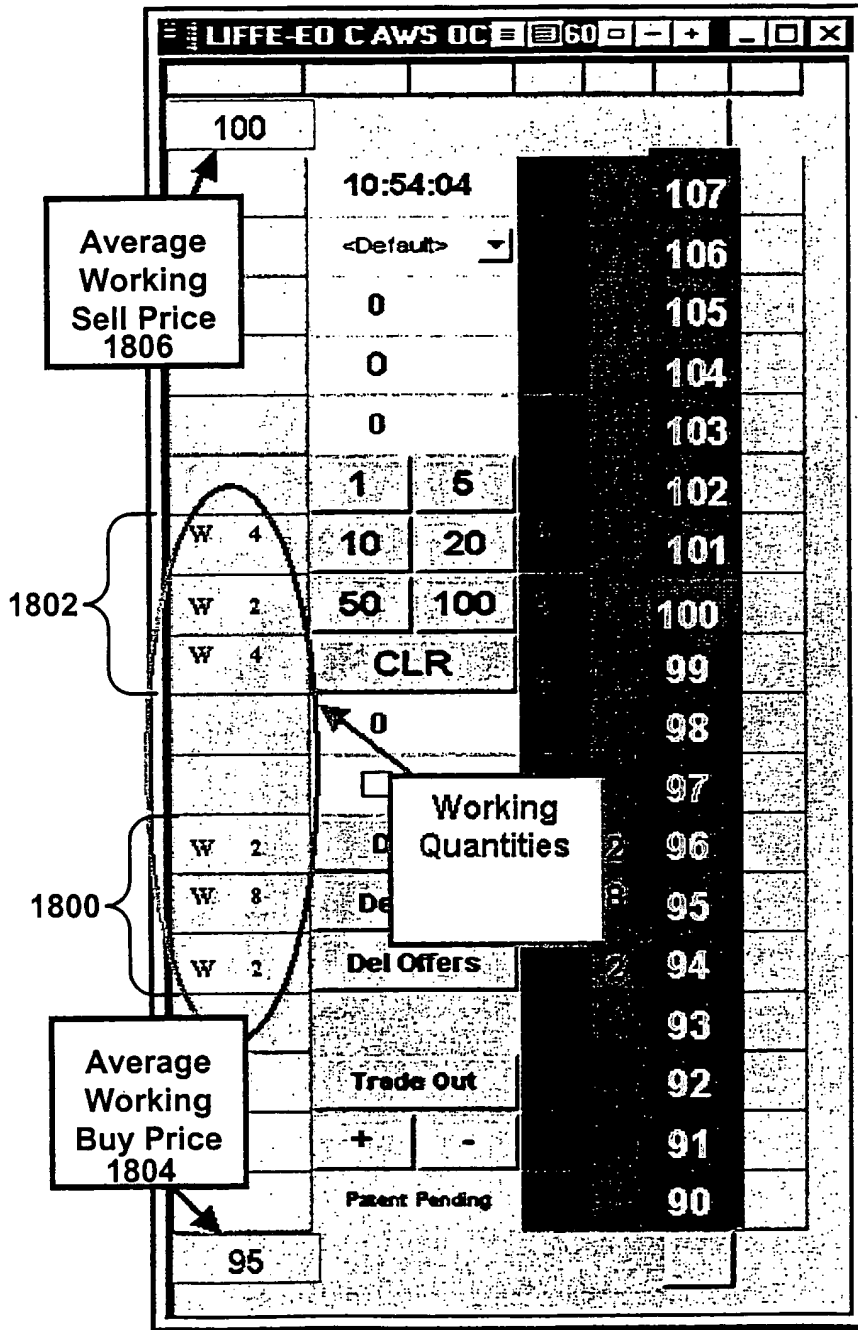


FIG. 19A

FIG. 19B

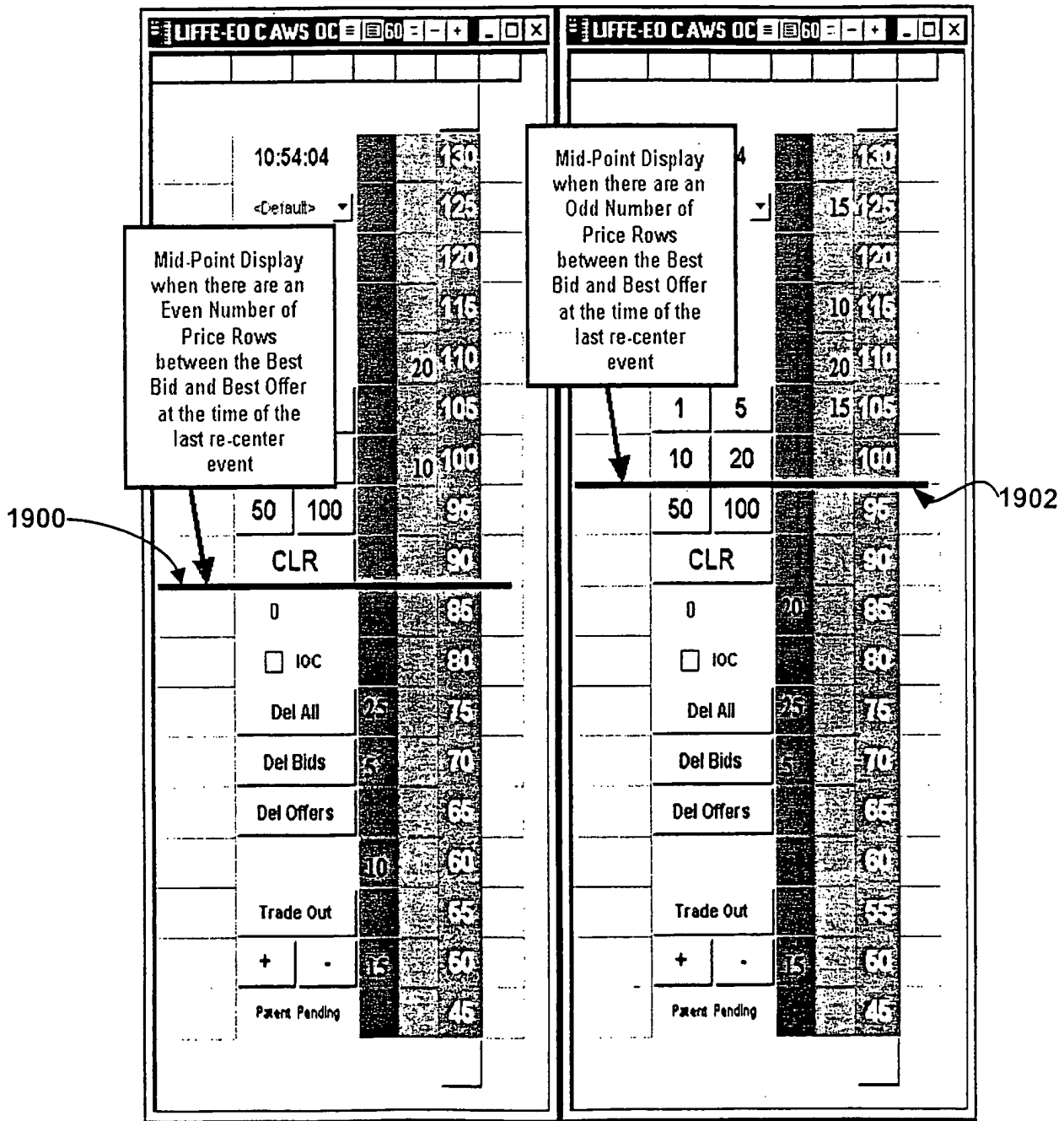


FIG. 19C

MD Trader Options for LIFFE-E AOL DEC01

GUI Options

- Show Tooltips
- Show Clock
- Show Customer Account Combobox
- Show IOC Checkbox
- Show Delete All Button
- Show TradeOut Button
- Show Bid Indicator Column
- Show Ask Indicator Column
- Color Code Blank Spots
- Keep MD Trader on Top
- Do "Delete All" when LTQ Column Clicked
- Do Sweep on Right Click
- Left Button actions on Mouse DOWN
- Allow only one order per side of market
- Use Inside Market Prices
- Enable Keyboard and Function Key Trading
- Highlight Midpoint of Last Recenter**
- Enable Average Price
- Enable Drag/Drop of Working Orders
- Show Bold Text on Bid/Ask Column
- Set row height

Format

digits for Working/Exec.

digits for Price Display

Price Consolidation

Prices per line Offset

Show Slider Control Increment(Ticks)

Order Parameters

Maximum Order Quantity

TradeOut Method

of ticks to skew

Centering

rows from top/bottom

rows from top/bottom

rows from top/bottom

Enable Grid Recentering

Stop Orders

- Enable Stop Market Orders
- Enable Stop Limit Orders
- Set Stop limit price ticks from stop entry price

Display Delete Buttons/Working Quantity Totals

- Display Working Buys/Sells - Text Only
- Delete Total Working Buys/Sells - Quantity on Button
- Delete Bids/Offers - Button Only
- Display Working Buys/Sells as Text and Delete Bids/Offers as buttons

1906 → Highlight Midpoint of Last Recenter

Check Box to Enable 'Highlight Midpoint of Last Recenter' Feature

FIG. 20A

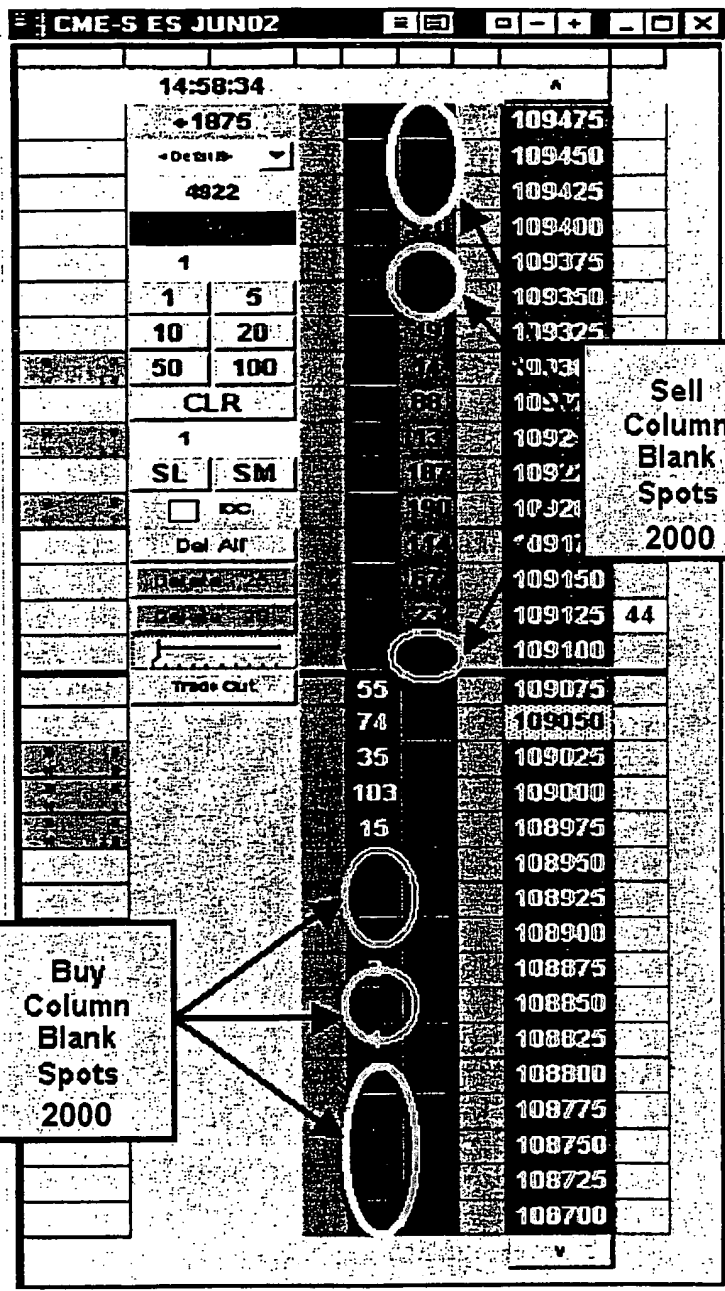


FIG. 20B

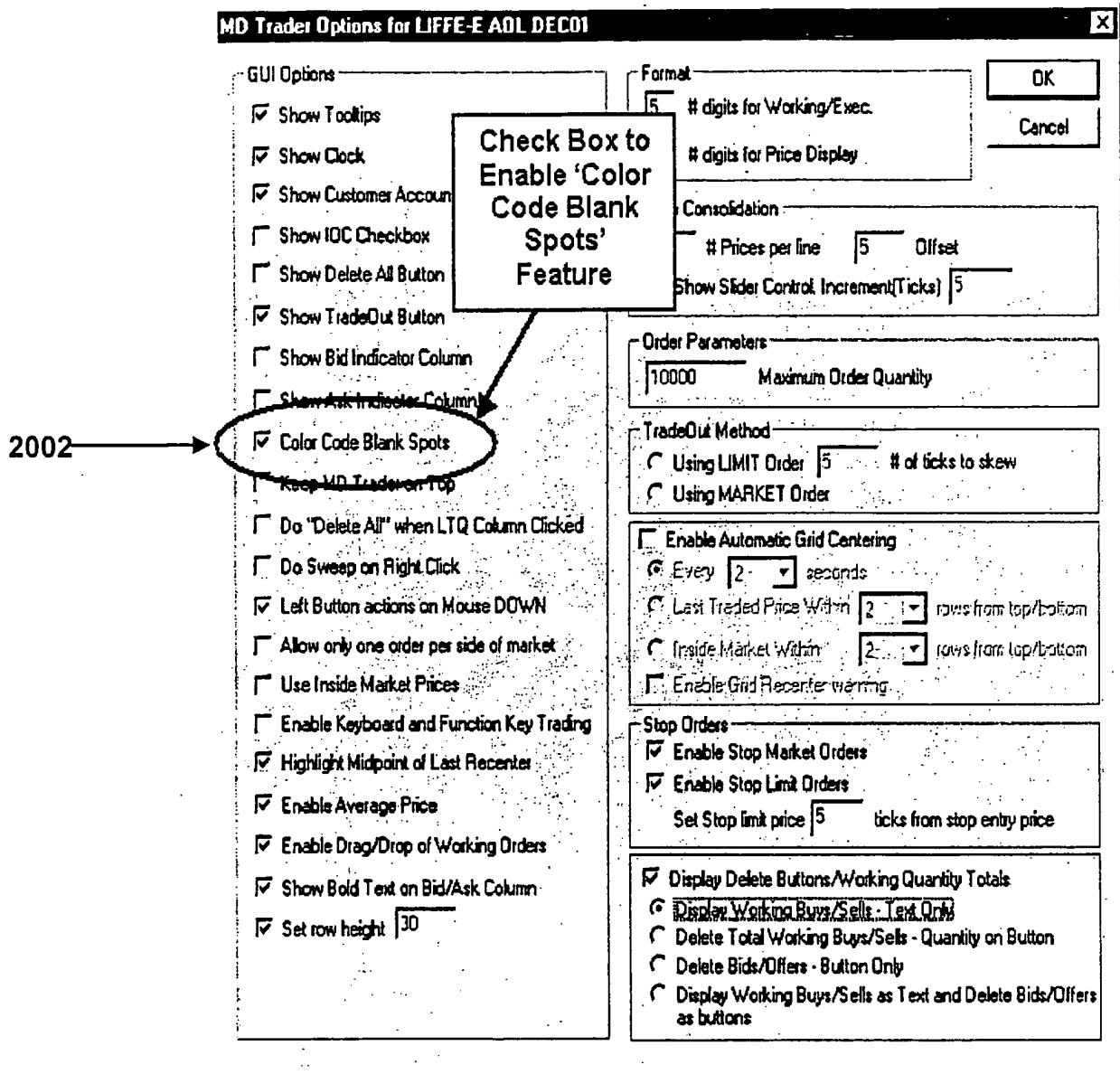


FIG. 21

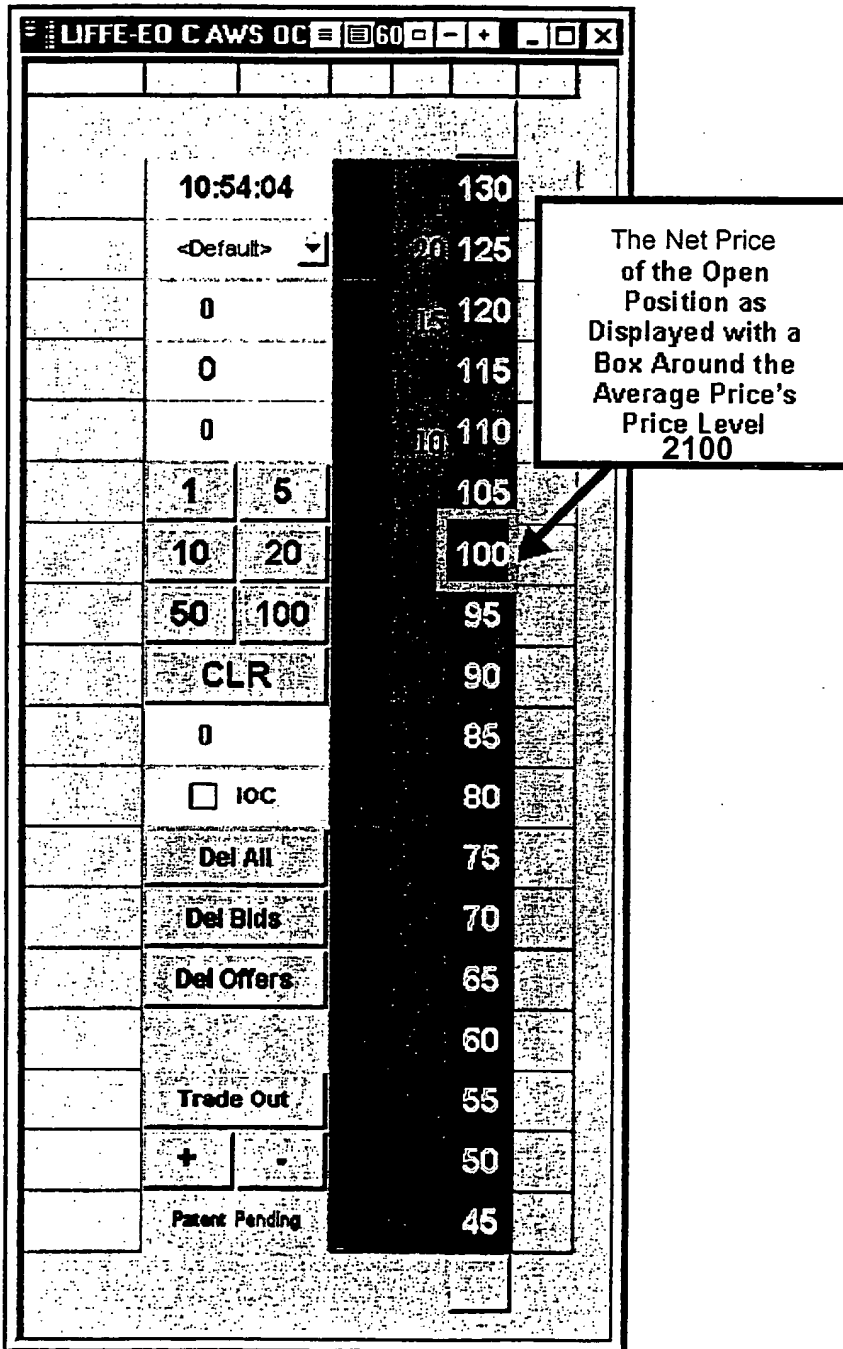
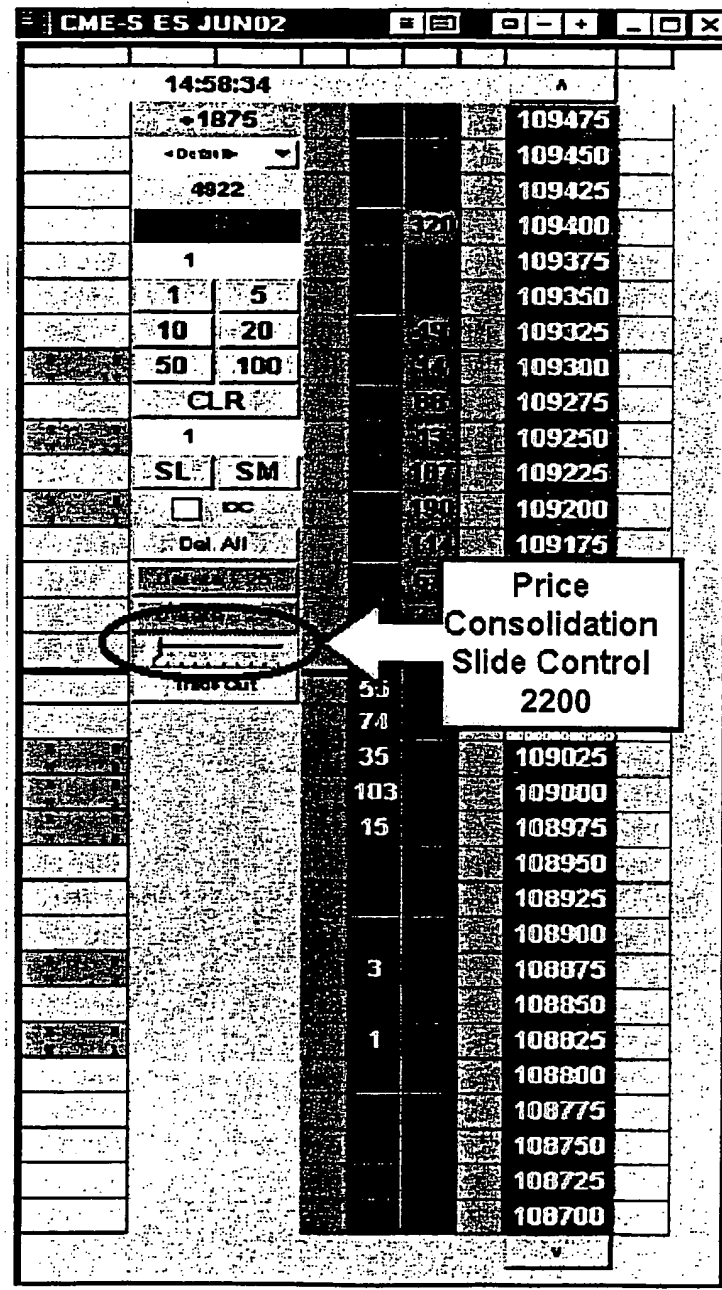


FIG. 22



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Application Data Sheet

Application Information

Application Type::	Regular
Subject Matter::	Utility
Suggested Classification::	None
Suggested Group Art Unit::	None
CD-Rom or CD-R?	No
Title::	A System and Method for Automatic Repositioning of Market Information in a Graphical User Interface
Attorney Docket Number::	02-211-Z6
Request for Early Publication?::	No
Request for Non-Publication?::	No
Suggested Drawing Figure::	None
Total Drawing Sheets::	27
Small Entity::	No
Petition Included?::	No
Secrecy Order in Parent Appl.?::	No

Applicant Information

Applicant Authority type::	Inventor
Primary Citizenship Country::	United States of America
Status::	Full Capacity
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State of Residence::	Illinois
Country of Residence::	United States of America
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City of mailing address::	Chicago
State or Province of mailing address::	Illinois

Postal or Zip Code of mailing address:: 60614

Applicant Authority type:: Inventor
Primary Citizenship Country:: Germany
Status:: Full Capacity
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Family Name:: Schluetter
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State of Residence:: Illinois
Country of Residence:: United States of America
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City of mailing address:: Evanston
State or Province of mailing address:: Illinois
Postal or Zip Code of mailing address:: 60201

Correspondence Information

Correspondence Customer Number:: 039310

Representative Information

Representative Customer Number::	039310
----------------------------------	--------

Domestic Priority Information

Application::	Continuity Type::	Parent Application::	Parent Filing Date::
This application	Continuation	10/403,881	March 31, 2003
10/403,881	Continuation of	10/125,894	April 19, 2002
10/125,894	Continuation-in-part	09/971,087	October 5, 2001
09/971,087	An application claiming the benefit under 35 USC 119(e)	60/238,001	October 6, 2000
10/125,894	Continuation-in-part	09/590,692	June 9, 2000
10/125,894	Continuation-in- part	09/589,751	June 9, 2000
09/590,692	An application claiming the benefit under 35 USC 119(e)	60/186,322	March 2, 2000

09/589,751	An application claiming the benefit under 35 USC 119(e)	60/186,322	March 2, 2000
10/125,894	An application claiming the benefit under 35 USC 119(e)	60/325,553	October 1, 2001

Foreign Priority Information

Country::	Application Number::	Filing Date::	Priority Claimed::

Assignee Information

Assignee Name :: Trading Technologies International, Inc.

**DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**SYSTEM AND METHOD FOR AUTOMATIC RESPOSITIONING OF
MARKET INFORMATION IN A GRAPHICAL USER INTERFACE**

the specification of which is attached hereto unless the following space is checked:

was filed on _____ as United States Application Serial Number _____.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s):

	<u>Number</u>	<u>Country</u>	<u>Day/Month/Year Filed</u>
1.			
2.			

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

	<u>Application Number</u>	<u>Filing Date</u>
1.	60/238,001	10/6/00
2.	60/183,322	3/2/00
3.	60/325,553	10/1/01

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or § 365(c) of any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

	<u>Application Number</u>	<u>Filing Date</u>	<u>Status: patented, pending, abandoned</u>
1.	10/125,894	4/19/02	Pending
2.	09/971,087	10/5/01	
3.	09/590,692	6/9/00	
4.	09/589,751	6/9/00	

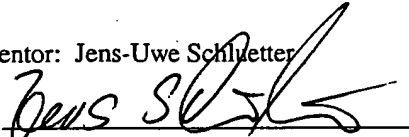
The PTO did not receive the following listed item(s) FOR-NPL

I hereby appoint the practitioners associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and I direct that all correspondence be addressed to that Customer Number.

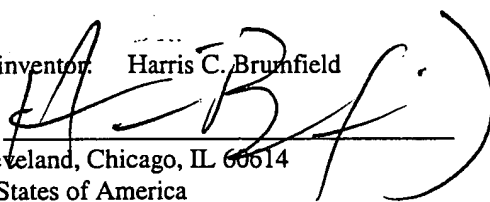
Customer Number: 020306
Principal attorney or agent: Matthew J. Sampson
Telephone number: 312-913-0001

I further appoint Steven F. Borsand, Registration No. 36,752, Mark W. Triplett, Registration No. 49,002 and Monika Dudek, Registration No. 47,538, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

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

Full name of first inventor: Jens-Uwe Schluetter
Inventor's signature: 
Residence: 2320 Grey, Evanston, IL 60201
Citizenship: Germany
Post Office Address: 2320 Grey, Evanston, IL 60201

Date: 3/31/03

Full name of second inventor: Harris C. Brunfield
Inventor's signature: 
Residence: 1840 Cleveland, Chicago, IL 60614
Citizenship: United States of America
Post Office Address: 1840 Cleveland, Chicago, IL 60614

Date: 3/31/03

FORM PTO-1449 (Rev. 2-32)	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. 02-211-B	Serial No. 10/403,881
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)		Applicant: Brumfield et al.	
		Filing Date: 3/31/2003	Group: 3624

FOREIGN PATENT DOCUMENTS

	Document Number	Date	Country	Class	Subclass	Translation	
						Yes	No
	WO01/88808A1	11/22/2001	PCT				
	WO02/15461A2	2/21/2002	PCT				
	WO20/48945A1	6/20/2002	PCT				
	WO01/16852C1	6/27/2002	PCT				
	WO20/59815A1	8/1/2002	PCT				
	WO20/69226A2	9/6/2002	PCT				
	WO20/79940A2	10/10/2002	PCT				
	WO20/93325A2	11/21/2002	PCT				

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

		USPTO Presentation, NASDAQ, November 8, 2001
		Kharouf, A Trading Room with a View, Futures, 27, 11 - 11/1998
		www.tradingtechnologies.com/products/xtrade_full.html (viewed 5/22/01) 6/9/2000

EXAMINER	DATE CONSIDERED
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

<p>FORM PTO-1449 (Rev. 2-32)</p> <p style="text-align: center;">U.S. Department of Commerce Patent and Trademark Office</p> <p style="text-align: center;">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p> <p style="text-align: center;">(Use several sheets if necessary)</p>	<p>Atty. Docket No. 02-211-B</p>	<p>Serial No. 10/403,881</p>
<p>Applicant: Brumfield et al.</p>		<p>Filing Date: 3/31/2003</p>
<p>Group: 3624</p>		

U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate

FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
		WO95/26005A1	9/28/1995	PCT				
		WO99/30259A1	6/17/1999	PCT				
		WO00/52619A1	9/8/2000	PCT				
		WO00/62187A2	10/19/2000	PCT				
		WO00/62187A3	10/19/2000	PCT				
		WO00/65510A1	11/2/2000	PCT				
		EP1067471A1	1/10/2001	EPO				
		WO01/16830A1	3/8/2001	PCT				
		WO01/16852A2	3/8/2001	PCT				
		WO01/22315A2	3/29/2001	PCT				

EXAMINER	DATE CONSIDERED
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

<p>FORM PTO-1449 (Rev. 2-32)</p> <p style="text-align: center;">U.S. Department of Commerce Patent and Trademark Office</p> <p style="text-align: center;">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p> <p style="text-align: center;">(Use several sheets if necessary)</p>	<p>Atty. Docket No. 02-211-B</p>	<p>Serial No. 10/403,881</p>
<p>Applicant: Schluetter et al.</p>		
<p>Filing Date: 3/31/2003</p>		<p>Group: 3624</p>

U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate

FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
		WO9114231A1	9/19/1991	PCT				
		WO9849639A1	11/5/1998	PCT				
		WO9919821A1	4/22/1999	PCT				
		WO9953424A1	10/21/1999	PCT				
		WO0122315A3	3/29/2001	PCT				
		WO0165403A2	9/7/2001	PCT				
		WO02103601A1	12/27/2001	PCT				
		WO0229686A1	4/11/2002	PCT				
		WO03090032A2	10/30/2003	PCT				

EXAMINER	DATE CONSIDERED
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

<p>FORM PTO-1449 (Rev. 2-32)</p> <p style="text-align: center;">U.S. Department of Commerce Patent and Trademark Office</p> <p style="text-align: center;">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p> <p style="text-align: center;">(Use several sheets if necessary)</p>	<p>Atty. Docket No. 02-211-B</p>	<p>Serial No. 10/403,881</p>
<p>Applicant: Schluetter et al.</p>		
<p>Filing Date: 3/31/2003</p>		<p>Group: 3624</p>

FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
		W003090032A3	10/30/2003	PCT				

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

<p>EXAMINER</p>	<p>DATE CONSIDERED</p>
------------------------	-------------------------------

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

FORM PTO-1449
(Rev. 2-32)

U.S. Department of Commerce
Patent and Trademark Office

Atty. Docket No.

02-211-B

Serial No.

10/403,881

INFORMATION DISCLOSURE
STATEMENT BY APPLICANT

(Use several sheets if necessary)

Applicant:

Brumfield et al.

Filing Date:

3/31/2003

Group:

3624

U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate

FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

		APT Brochure, LIFFE Exchange, circa 1990*
		Trading Screen, INTEX of Bermuda, circa 1984*
		Weber, Information Technology in the Major International Financial Markets, April 7, 1993
		Trading Screen, TIFFE Exchange, circa 1989-1990*
		Trading Screen, MEFF Exchange, circa 1990*
		Cavaletti, Order Routing Article, Futures Magazine, February 1997
		Aurora Article, CBOT, circa 1989*

EXAMINER	DATE CONSIDERED
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

FORM PTO-1449
(Rev. 2-32)

U.S. Department of Commerce
Patent and Trademark Office

INFORMATION DISCLOSURE
STATEMENT BY APPLICANT

(Use several sheets if necessary)

Atty. Docket No.

02-211-B

Serial No.

10/403,881

Applicant:

Brumfield et al.

Filing Date:

3/31/2003

Group:

3624

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

	One Click Trading Options, Trading Technologies, circa 1998
	Trading Screen, SWX Exchange, circa 1990*
	Expanding futures and options trading around the world, around the clock, GLOBEX, circa 1989*
	Hansell, The computer that ate Chicago, Institutional Investor, February 1989
	Globex Report: An update on the CME Global electronic exchange, February 10, 1989
	NYMEX Access Documents, New York Mercantile Exchange, February 28, 1992
	CATS Traders' Manual, Toronto Stock Exchange, September 30, 1977
	Market Watch, Trading Screen, date not available
	Grummer, Peake, Sellers, Preliminary Feasibility Study, Bermudex Ltd., November 1980
	Peake, Mendellson, The ABCs of trading on a national market system, Appendix C of Preliminary Feasibility Study, Bermudex Ltd., September 1997
	Peake, The last 15 meters, Appendix E of Preliminary Feasibility Study, Bermudex Ltd., June 15, 1997
	Declaration of Brendan Bradley in Case No. 04 C 5312, November 18, 2004
	Memorandum Opinion Published February 9, 2005, of Judge James B. Moran in Case No. 04 C 5312

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

Form PTO-1449	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. 02-211-B	Serial No. 10/403,881
INFORMATION DISCLOSURE STATEMENT BY APPLICANT		Applicant: Brumfield, et al.	
		Filing Date: March 31, 2003	Group: 3624

U.S. PATENT DOCUMENTS

Examiner Initial	No.	Document Number	Date	Name	Class	Subclass	Filing Date

FOREIGN PATENT DOCUMENTS

Examiner Initial	No.	Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
		WO 00/64176	10-26-00	PCT				
		WO 01/01077	1-4-01	PCT				
		WO 01/71557	9-27-01	PCT				
		WO 03/017062	2-27-03	PCT				

OTHER DOCUMENTS - Including Author, Title, Date, Pertinent Pages, Etc.

Examiner Initial	No.	Document
		Search Report issued by the Australian Patent Office for SG 200406082-8

Examiner	Date Considered
-----------------	------------------------

AMINER: Initial if citation considered whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with any communication.

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11417547
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APPLICATION AS FILED – PART I			SMALL ENTITY	OR	OTHER THAN SMALL ENTITY	
	(Column 1)	(Column 2)				
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	RATE (\$)	FEE (\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A		N/A	300
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A		N/A	500
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A		N/A	200
TOTAL CLAIMS (37 CFR 1.16(i))	34	minus 20 = * 14	X 25=		X 50=	700
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2	minus 3 = *	X 100=		X 200=	
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR					
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			N/A		N/A	
			TOTAL		TOTAL	1700

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II					SMALL ENTITY	OR	OTHER THAN SMALL ENTITY	
	(Column 1)	(Column 2)	(Column 3)					
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	X =		X =	
	Independent (37 CFR 1.16(h))	*	Minus ***	=	X =		X =	
	Application Size Fee (37 CFR 1.16(s))							
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))				N/A		N/A	
					TOTAL ADD'T FEE		TOTAL ADD'T FEE	

	(Column 1)	(Column 2)	(Column 3)					
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	X =		X =	
	Independent (37 CFR 1.16(h))	*	Minus ***	=	X =		X =	
	Application Size Fee (37 CFR 1.16(s))							
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))				N/A		N/A	
					TOTAL ADD'T FEE		TOTAL ADD'T FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.


UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/417,547	05/03/2006	Jens-Uwe Schluetter	02-211-Z6

039310
 MBHB/TRADING TECHNOLOGIES
 300 SOUTH WACKER DRIVE
 SUITE 3200
 CHICAGO, IL 60606

CONFIRMATION NO. 8101
FORMALITIES
LETTER

Date Mailed: 06/05/2006

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
Applicant must submit \$ 300 to complete the basic filing fee for a non-small entity. If appropriate, applicant may make a written assertion of entitlement to small entity status and pay the small entity filing fee (37 CFR 1.27).

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Additional claim fees of **\$700** as a non-small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **\$1830** for a Large Entity

- **\$300** Statutory basic filing fee.
- **\$130** Surcharge.
- The application search fee has not been paid. Applicant must submit **\$500** to complete the search fee.

- The application examination fee has not been paid. Applicant must submit **\$200** to complete the examination fee for a large entity
- Total additional claim fee(s) for this application is **\$700**
 - **\$700** for **14** total claims over 20.

Replies should be mailed to: Mail Stop Missing Parts
 Commissioner for Patents
 P.O. Box 1450
 Alexandria VA 22313-1450

*A copy of this notice **MUST** be returned with the reply.*



Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382
PART 3 - OFFICE COPY



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/417,547	05/03/2006	Jens-Uwe Schluetter	02-211-Z6

039310
 MBHB/TRADING TECHNOLOGIES
 300 SOUTH WACKER DRIVE
 SUITE 3200
 CHICAGO, IL 60606

DOCKETED

JUN - 8 2006

DUE DATE: 8-5-06
 BY: [Signature]

CONFIRMATION NO. 8101

FORMALITIES
LETTER

Date Mailed: 06/05/2006

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

*Filing Date Granted***Items Required To Avoid Abandonment:**

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
Applicant must submit \$ 300 to complete the basic filing fee for a non-small entity. If appropriate, applicant may make a written assertion of entitlement to small entity status and pay the small entity filing fee (37 CFR 1.27).

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Additional claim fees of **\$700** as a non-small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **\$1830** for a Large Entity


- **\$300** Statutory basic filing fee.
- **\$130** Surcharge.
- The application search fee has not been paid. Applicant must submit **\$500** to complete the search fee.

- The application examination fee has not been paid. Applicant must submit **\$200** to complete the examination fee for a large entity

- Total additional claim fee(s) for this application is **\$700**
 - **\$700** for **14** total claims over 20.

Replies should be mailed to: Mail Stop Missing Parts
 Commissioner for Patents
 P.O. Box 1450
 Alexandria VA 22313-1450

*A copy of this notice **MUST** be returned with the reply.*



Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382
PART 1 - ATTORNEY/APPLICANT COPY

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
MBHB Case No. 02-211-Z6

In re Application of:)	
Jens-Uwe Schluetter et al.)	Group Art Unit: 3624
)	
Serial No.: 11/417,547)	Examiner: not assigned
)	
Filed: May 3, 2006)	
)	
For: System and Method for Automatic)	
Repositioning of Market Information in)	
Graphical User Interface)	
)	

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**RESPONSE TO THE NOTICE TO FILE MISSING PARTS MAILED JUNE 5, 2006 AND
PRELIMINARY AMENDMENT**

Dear Sir:

Responsive to the Notice to File Missing Parts mailed June 5, 2006, Applicants submit the following amendments and remarks.

Amendments to the Specification begin on page 2 of this response.

Amendments to the claims begin on page 3 of this response.

Remarks begin on page 4 of this response.

AMENDMENT TO THE SPECIFICATION

Please replace paragraph [001] on page 2 with the following amended paragraph.

This application is a continuation of U.S. Patent Application Serial No. 10/403,881, filed March 31, 2003, which is a continuation of U.S. Patent Application No. 10/125,894, "Trading Tools for Electronic Trading," filed April 19, 2002, which is a continuation-in-part of U.S. Patent Application No. 09/971,087, filed October 5, 2001, which claims the benefit of U.S. Provisional Application No. 60/238,001, filed October 6, 2000. U.S. Patent Application No. 10/125,894 is also a continuation-in-part of U.S. Patent Application No. 09/590,692, filed June 9, 2000 and U.S. Patent Application No. 09/589,751, filed June 9, 2000, both of which claim the benefit of U.S. Provisional Application No. 60/186,322, filed March 2, 2000. U.S. Patent Application Serial No. 10/125,894 also claims the benefit of U.S. Patent Application No. 60/325,553, filed October 1, 2001. The entire content of each of the above-referenced applications is incorporated herein by reference.

AMENDMENT TO THE CLAIMS

Claim 1 (Original). A method for automatically positioning information related to a commodity on a graphical user interface, the method comprising:

receiving market information relating to the commodity from an electronic exchange, the market information comprising a plurality of items of interest, each item of interest associated with a price;

displaying an information display region comprising a plurality of locations arranged such that each location corresponds to a price level along at least a portion of a static price axis;

displaying a plurality of indicators at a first time, each indicator associated with an item of interest and each indicator being displayed in one of the plurality of locations in the information display region corresponding to a price level that is associated with the item of interest; and

automatically repositioning the static price axis upon detecting a predetermined condition such that the plurality of locations of the information display region corresponds to a different portion of the static price axis at a second time;

wherein each of the plurality of indicators is moved to a new location in the information display region that corresponds to the price level on the static price axis that is associated with that indicator.

Claims 2-34. (Canceled)

REMARKS

Applicants submit the present response to the Notice to File Missing Parts mailed June 5, 2006. Within the Missing Parts, Applicants were informed that the (i) statutory basic filing fee, (ii) search fee, (iii) examination fee and (iv) additional claim fees were missing.

As set forth above, Applicants have amended the specification to include the cross-reference to the priority documents. Applicants have also canceled claims 2-34 without prejudice towards any further or additional prosecution of claims having similar or identical subject matter. Thus, Applicants wish to cancel all pending claims, except claim 1.

Applicants include with this response a payment of \$1130.00 for payment of the following fees:

Surcharge for late submission of filing fee	Statutory Basic Filing Fee	Search Fee	Examination Fee	Additional Claim Fees	Total Fees
\$130.00	\$300.00	\$500.00	\$200.00	\$0.00	\$1130.00

The Examiner is invited to call Applicants' representative, Mark Triplett at (312) 476-1151 or the undersigned at (312) 913-3331 with any questions or comments.

Respectfully submitted,

By: /s Joseph Herndon
Joseph A. Herndon
Reg. No. 50,469

Electronic Patent Application Fee Transmittal

Application Number:	11417547
Filing Date:	03-May-2006
Title of Invention:	System and method for automatic repositioning of market information in a graphical user interface
First Named Inventor:	Jens-Uwe Schluetter
Filer:	Joseph Allen Herndon
Attorney Docket Number:	02-211-Z6

Filed as Large Entity

Utility Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	300	300
Utility Search Fee	1111	1	500	500
Utility Examination Fee	1311	1	200	200

Pages:

Claims:

Miscellaneous-Filing:

Late filing fee or oath or declaration	1051	1	130	130
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Petition:

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1130

Electronic Acknowledgement Receipt

EFS ID:	1132154
Application Number:	11417547
Confirmation Number:	8101
Title of Invention:	System and method for automatic repositioning of market information in a graphical user interface
First Named Inventor:	Jens-Uwe Schluetter
Customer Number:	39310
Filer:	Joseph Allen Herndon
Filer Authorized By:	
Attorney Docket Number:	02-211-Z6
Receipt Date:	31-JUL-2006
Filing Date:	03-MAY-2006
Time Stamp:	13:53:47
Application Type:	Utility
International Application Number:	

Payment information:

Submitted with Payment	yes
Payment was successfully received in RAM	\$ 1130
RAM confirmation Number	902
Deposit Account	132490
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 and 1.17	

File Listing:

0120

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part	Pages
1	Applicant Response to Pre-Exam Formalities Notice	02_211_Z6missingpartsnotice.pdf	93698	no	2
Warnings:					
Information:					
2		02_211_Z6preliminaryamendment.pdf	111521	yes	4
	Multipart Description				
	Doc Desc		Start	End	
	Applicant Response to Pre-Exam Formalities Notice		1	1	
	Specification		2	2	
	Claims		3	3	
	Applicant Arguments/Remarks Made in an Amendment		4	4	
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	8521	no	2
Warnings:					
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<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p>					

Electronic Acknowledgement Receipt

EFS ID:	1132154
Application Number:	11417547
Confirmation Number:	8101
Title of Invention:	System and method for automatic repositioning of market information in a graphical user interface
First Named Inventor:	Jens-Uwe Schluetter
Customer Number:	39310
Filer:	Joseph Allen Herndon
Filer Authorized By:	
Attorney Docket Number:	02-211-Z6
Receipt Date:	31-JUL-2006
Filing Date:	03-MAY-2006
Time Stamp:	13:53:47
Application Type:	Utility
International Application Number:	

Payment information:

Submitted with Payment	yes
Payment was successfully received in RAM	\$ 1130
RAM confirmation Number	902
Deposit Account	132490
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 and 1.17	

File Listing:

0122

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part	Pages
1	Applicant Response to Pre-Exam Formalities Notice	02_211_Z6missingpartsnotice.pdf	93698	no	2
Warnings:					
Information:					
2		02_211_Z6preliminaryamendment.pdf	111521	yes	4
	Multipart Description				
	Doc Desc		Start	End	
	Applicant Response to Pre-Exam Formalities Notice		1	1	
	Specification		2	2	
	Claims		3	3	
	Applicant Arguments/Remarks Made in an Amendment		4	4	
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	8521	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			213740		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD
Substitute for Form PTO-875

Application or Docket Number

11417547

APPLICATION AS FILED - PART I

(Column 1) (Column 2)

FOR	NUMBER FILED	NUMBER EXTRA
BASIC FEE (37 CFR 1.18(a), (b), or (c))	N/A	N/A
SEARCH FEE (37 CFR 1.18(k), (l), or (m))	N/A	N/A
EXAMINATION FEE (37 CFR 1.18(o), (p), or (q))	N/A	N/A
TOTAL CLAIMS (37 CFR 1.18(f))	34 minus 20 =	14
INDEPENDENT CLAIMS (37 CFR 1.18(h))	2 minus 3 =	
APPLICATION SIZE FEE (37 CFR 1.18(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR	
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))		

SMALL ENTITY

RATE (\$)	FEE (\$)
N/A	
N/A	
N/A	
X 25=	
X 100=	
N/A	
TOTAL	

OR

OTHER THAN SMALL ENTITY

RATE (\$)	FEE (\$)
N/A	300
N/A	500
N/A	200
X 50=	700
X 200=	
N/A	
TOTAL	1700

OR

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED - PART II

(Column 1) (Column 2) (Column 3)

AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
7-31-06			
Total (37 CFR 1.18(f))	1	34	=
Independent (37 CFR 1.18(h))	1	3	=
Application Size Fee (37 CFR 1.16(s))			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			

SMALL ENTITY

RATE (\$)	ADDITIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL ADD'T FEE	

OR

OTHER THAN SMALL ENTITY

RATE (\$)	ADDITIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL ADD'T FEE	

OR

OR

OR

OR

(Column 1) (Column 2) (Column 3)

AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total (37 CFR 1.18(f))			=
Independent (37 CFR 1.18(h))			=
Application Size Fee (37 CFR 1.16(s))			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			

RATE (\$)	ADDITIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL ADD'T FEE	

OR

RATE (\$)	ADDITIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL ADD'T FEE	

OR

OR

OR

OR

- * If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 - ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
 - *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
- The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/417,547	05/03/2006	Jens-Uwe Schluetter	02-211-Z6

CONFIRMATION NO. 8101

039310
MBHB/TRADING TECHNOLOGIES
300 SOUTH WACKER DRIVE
SUITE 3200
CHICAGO, IL60606

Title: System and method for automatic repositioning of market information in a graphical user interface

Publication No. US-2006-0265305-A1

Publication Date: 11/23/2006

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publicly available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 703-305-3028.

Pre-Grant Publication Division, 703-605-4283

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Case No. 02-211-Z6)

PATENT

In the Application of:)	
)	
Schluetter et al.)	Art Unit: 3624
)	
Serial No. 11/417,547)	
)	Examiner: Not Assigned
Filed: May 3, 2006)	
)	
Title: System and Method for Automatic Repositioning)	
Of Market Information in a Graphical User)	
Interface)	

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 C.F.R. Section 1.97-1.98, and in accordance with the duty of candor set forth in 37 C.F.R. §1.56, applicants wish to make the following references of record in the above-identified application. Copies of the references cited below are enclosed along with a copy of completed PTO Form-1449.

I. DOCUMENTS

1. Tokyo Stock Exchange ("TSE"), "Publication 1", September 1997
2. TSE, "Publication 2", August 1998
3. TSE, "Publication 3," July 31, 2000
4. TSE, Document 1, January 2000
5. English Translation of TSE "Publication 1"
6. English Translation of TSE "Publication 2"
7. English Translation of TSE "Publication 3"
8. English Translation of TSE Document 1
9. REFCO English Translation of TSE "Publication 1"

McDonnell Boehnen Hulbert & Berghoff
300 South Wacker Drive
Chicago, Illinois 60606
(312) 913-0001

10. REFCO English Translation of TSE "Publication 2"
11. REFCO English Translation of TSE "Publication 3"

II. DISCUSSION

Pursuant to the duty of disclosure provided by 35 C.F.R. § 1.56 and §§ 1.97-98, the Applicants wish to make the foregoing references of record in the above-identified application. These references were submitted to the Japanese Patent Office with respect to pending patent application no. 2001-564025 which is a foreign counterpart to U.S. Patents 6,772,132 and 6,766,304, which are commonly owned by Trading Technologies International Inc. The present application is a continuation-in-part application, claiming priority to applications ultimately resulting in U.S. Patents Nos. 6,772,132 and 6,766,304. For sake of completeness, the Japanese version of the documents ("Publication 1," "Publication 2," "Publication 3," and "Document 1") are being submitted along with two sets of English translations. One set originates from Applicants upon learning of the Japanese documents and the second set was provided separately in connection with a litigation involving U.S. Patents Nos. 6,766,304 and 6,772,132, in a lawsuit bearing the caption Trading Technologies International Inc. v. REFCO Inc., Docket No. 05-C-1079, United States District Court for the Northern District of Illinois, which has since been settled. Although these references appear to be cumulative of what has already been cited, out of an abundance of caution Applicants are submitting these references for full consideration by the Office.

No representation is intended as to the relative importance of any portion of the references, and this statement is not intended as a representation that the cited references even constitute "prior art" within the meaning of 35 U.S.C. sections 102 or 103, nor as an admission that the information is considered to be material to patentability. Applicants make no representation regarding the accuracy of the dates associated with the references or their

characterization as a "Publication".

Applicants submit that these documents, whether taken alone or in combination with others previously of record, fail to show or suggest the claimed subject matter. Applicants request that the Examiner consider the entirety of the documents and make them of record in this application.

Respectfully Submitted,

Date: January 30, 2007

/Joseph A. Herndon/
Joseph A. Herndon
Reg. No. 50,469

<p>FORM PTO-1449 (Rev. 2-32)</p> <p style="text-align: center;">U.S. Department of Commerce Patent and Trademark Office</p> <p style="text-align: center;">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p> <p style="text-align: center;">(Use several sheets if necessary)</p>	<p>Atty. Docket No. 02-211-Z6</p>	<p>Serial No. 11/417,547</p>
<p>Applicant: Schluetter et al.</p>		
<p>Filing Date: May 3, 2006</p>		<p>Group: 3624</p>

U.S. PATENT DOCUMENTS

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate

FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

		Tokyo Stock Exchange ("TSE"), Publication 1, September 1997
		Tokyo Stock Exchange, "Publication 2", August 1998
		Tokyo Stock Exchange, Publication 3, July 31, 2000
		Tokyo Stock Exchange, Document 1, January 2000
		English Translation of TSE "Publication 1"
		English Translation of TSE "Publication 2"

EXAMINER	DATE CONSIDERED
-----------------	------------------------

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

FORM PTO-1449 (Rev. 2-32)	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. 02-211-Z6	Serial No. 11/417,547
		INFORMATION DISCLOSURE STATEMENT BY APPLICANT	
		(Use several sheets if necessary)	
		Applicant: Schluetter et al.	
		Filing Date: May 3, 2006	Group: 3624

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

	English Translation of TSE "Publication 3"
	English Translation of TSE Document 1
	REFCO English Translation of TSE "Publication 1"
	REFCO English Translation of TSE "Publication 2"
	REFCO English Translation of TSE "Publication 3"

EXAMINER	DATE CONSIDERED
----------	-----------------

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

Electronic Acknowledgement Receipt

EFS ID:	1473798
Application Number:	11417547
International Application Number:	
Confirmation Number:	8101
Title of Invention:	System and method for automatic repositioning of market information in a graphical user interface
First Named Inventor/Applicant Name:	Jens-Uwe Schluetter
Customer Number:	39310
Filer:	Joseph Allen Herndon
Filer Authorized By:	
Attorney Docket Number:	02-211-Z6
Receipt Date:	30-JAN-2007
Filing Date:	03-MAY-2006
Time Stamp:	11:31:31
Application Type:	Utility

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Filed	02_211_Z6_IDS.pdf	72220	no	3

Warnings:

Information:					
This is not an USPTO supplied IDS fillable form					
2	Information Disclosure Statement (IDS) Filed	02_211_Z6_1449.pdf	100403	no	2
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	NPL Documents	TSE_Publication_1.pdf	961902	no	19
Warnings:					
Information:					
4	NPL Documents	TSE_Publication_2.pdf	904788	no	16
Warnings:					
Information:					
5	NPL Documents	TSE_Publication_3.pdf	714340	no	14
Warnings:					
Information:					
6	NPL Documents	TSE_Document_1.pdf	1037583	no	19
Warnings:					
Information:					
7	NPL Documents	Trans_TSE_Doc1.pdf	771858	no	19
Warnings:					
Information:					
8	NPL Documents	Trans_of_TSE_Pub1.pdf	812536	no	19
Warnings:					
Information:					
9	NPL Documents	Trans_of_TSE_Pub2.pdf	629415	no	16
Warnings:					
Information:					

10	NPL Documents	Trans_of_TSE_Pub3.pdf	645277	no	15
Warnings:					
Information:					
11	NPL Documents	Refco_Trans_TSE_Pub1.pdf	1107068	no	19
Warnings:					
Information:					
12	NPL Documents	Refco_Trans_TSE_Pub2.pdf	1073043	no	16
Warnings:					
Information:					
13	NPL Documents	Refco_Trans_TSE_Pub3.pdf	196947	no	6
Warnings:					
Information:					
Total Files Size (in bytes):			9027380		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
11/417,547 05/03/2006 Jens-Uwe Schluetter 02-211-Z6 8101

39310 7590 04/26/2007
MBHB/TRADING TECHNOLOGIES
300 SOUTH WACKER DRIVE
SUITE 3200
CHICAGO, IL 60606

EXAMINER

WEISBERGER, RICHARD C

ART UNIT PAPER NUMBER

3693

Table with 3 columns: SHORTENED STATUTORY PERIOD OF RESPONSE, MAIL DATE, DELIVERY MODE
3 MONTHS 04/26/2007 PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No. 11/417,547	Applicant(s) SCHLUETTER ET AL.	
Examiner Richard C. Weisberger	Art Unit 3693	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL.
- 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 1/30/06 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 5/23/2006, 1/30/009
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the claim the term static is one of degree. It is not clear to reference point(s) the continuously updating price axis is static. *with respect to*

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Next-Generation Futures Options Trading System.


The reference is directed to a front end futures trading platform and fully anticipated the claimed invention. See Chapter 7, section 7-3-2

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard C. Weisberger whose telephone number is 571 272 6753. The examiner can normally be reached during the hours of 6:30 AM to 10:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Krammer can be reached on 571 272 6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3693

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

 Richard C Weisberger
Primary Examiner
Art Unit 3693

FORM PTO-1449 (Rev. 2-32)	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. 02-211-Z6	Serial No. 11/417,547
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)		Applicant: Schluetter et al.	
		Filing Date: May 3, 2006	Group: 3624

U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate

FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

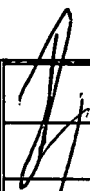
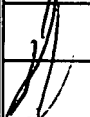
<i>A</i>		Tokyo Stock Exchange ("TSE"), Publication 1, September 1997
		Tokyo Stock Exchange, "Publication 2", August 1998
		Tokyo Stock Exchange, Publication 3, July 31, 2000
		Tokyo Stock Exchange, Document 1, January 2000
<i>A</i>		English Translation of TSE "Publication 1"
		English Translation of TSE "Publication 2"

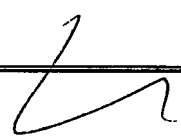
EXAMINER	DATE CONSIDERED 7/2/07
-----------------	-------------------------------

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

FORM PTO-1449 (Rev. 2-32)	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. 02-211-Z6	Serial No. 11/417,547
		INFORMATION DISCLOSURE STATEMENT BY APPLICANT	
		(Use several sheets if necessary)	
		Applicant: Schluetter et al.	
		Filing Date: May 3, 2006	Group: 3624

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

	English Translation of TSE "Publication 3"
	English Translation of TSE Document 1
	REFCO English Translation of TSE "Publication 1"
	REFCO English Translation of TSE "Publication 2"
	REFCO English Translation of TSE "Publication 3"

EXAMINER 	DATE CONSIDERED 4/2/07
--	------------------------

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

<p>FORM PTO-1449 (Rev. 2-32)</p> <p style="text-align: center;">U.S. Department of Commerce Patent and Trademark Office</p> <p style="text-align: center;">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p> <p style="text-align: center;">(Use several sheets if necessary)</p>	<p>Atty. Docket No. 02-211-B</p>	<p>Serial No. 10/403,881</p>
<p>Applicant: Brumfield et al.</p>		<p>Group: 3624</p>
<p>Filing Date: 3/31/2003</p>		<p>Group: 3624</p>

U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate

FOREIGN PATENT DOCUMENTS

	Document Number	Date	Country	Class	Subclass	Translation	
						Yes	No
	WO95/26005A1	9/28/1995	PCT				
	WO99/30259A1	6/17/1999	PCT				
	WO00/52619A1	9/8/2000	PCT				
	WO00/62187A2	10/19/2000	PCT				
	WO00/62187A3	10/19/2000	PCT				
	WO00/65510A1	11/2/2000	PCT				
	EP1067471A1	1/10/2001	EPO				
	WO01/16830A1	3/8/2001	PCT				
	WO01/16852A2	3/8/2001	PCT				
	WO01/22315A2	3/29/2001	PCT				

<p>EXAMINER</p>	<p>DATE CONSIDERED</p>
------------------------	-------------------------------

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

FORM PTO-1449 (Rev. 2-32)	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. 02-211-B	Serial No. 10/403-981
		Applicant: Brumfield et al.	
		Filing Date: 3/31/2003	Group: 3624

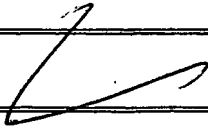
INFORMATION DISCLOSURE STATEMENT BY APPLICANT
 (Use several sheets if necessary)

FOREIGN PATENT DOCUMENTS

	Document Number	Date	Country	Class	Subclass	Translation	
						Yes	No
	WO01/88808A1	11/22/2001	PCT				
	WO02/15461A2	2/21/2002	PCT				
	WO20/48945A1	6/20/2002	PCT				
	WO01/16852C1	6/27/2002	PCT				
	WO20/59815A1	8/1/2002	PCT				
	WO20/69226A2	9/6/2002	PCT				
	WO20/79940A2	10/10/2002	PCT				
	WO20/93325A2	11/21/2002	PCT				

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

	USPTO Presentation, NASDAQ, November 8, 2001
	Kharouf; A Trading Room with a View, Futures, 27, 11 - 11/1998
	www.tradingtechnologies.com/products/xtrade_full.html (viewed 5/22/01) 6/9/2000

EXAMINER 	DATE CONSIDERED 4/07
--	--------------------------------

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

BEST AVAILABLE COPY

<p>FORM PTO-1449 (Rev. 2-32)</p> <p style="text-align: center;">U.S. Department of Commerce Patent and Trademark Office</p> <p style="text-align: center;">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p> <p style="text-align: center;">(Use several sheets if necessary)</p>	<p>Atty. Docket No. 02-211-B</p>	<p>Serial No. 10/403,881</p>		
		<p>Applicant: Schluetter et al.</p>		
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Filing Date: 3/31/2003</td> <td style="width: 50%;">Group: 3624</td> </tr> </table>	Filing Date: 3/31/2003	Group: 3624
Filing Date: 3/31/2003	Group: 3624			

U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate

FOREIGN PATENT DOCUMENTS

	Document Number	Date	Country	Class	Subclass	Translation	
						Yes	No
A	W09114231A1	9/19/1991	PCT				
A	W09849639A1	11/5/1998	PCT				
A	W09919821A1	4/22/1999	PCT				
A	W09953424A1	10/21/1999	PCT				
A	W00122315A3	3/29/2001	PCT				
A	W00165403A2	9/7/2001	PCT				
A	W002103601A1	12/27/2001	PCT				
A	W00229686A1	4/11/2002	PCT				
A	W003090032A2	10/30/2003	PCT				

<p>EXAMINER</p> <p style="text-align: center;"><i>[Signature]</i></p>	<p>DATE CONSIDERED</p> <p style="text-align: center;"><i>4/27</i></p>
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

FORM PTO-1449 (Rev. 2-32) U.S. Department of Commerce Patent and Trademark Office INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)	Atty. Docket No. 02-211-B	Serial No. 10/403,881
	Applicant: Schluetter et al.	
	Filing Date: 3/31/2003	Group: 3624

FOREIGN PATENT DOCUMENTS

	Document Number	Date	Country	Class	Subclass	Translation	
						Yes	No
<i>[Handwritten mark]</i>	W003090032A3	10/30/2003	PCT				

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

EXAMINER <i>[Handwritten Signature]</i>	DATE CONSIDERED 4/07
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<p>FORM PTO-1449 (Rev. 2-32)</p> <p style="text-align: center;">U.S. Department of Commerce Patent and Trademark Office</p> <p style="text-align: center;">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p> <p style="text-align: center;">(Use several sheets if necessary)</p>	<p>Atty. Docket No. 02-211-B</p>	<p>Serial No. <u>10/403,881</u></p>
<p>Applicant: Brumfield et al.</p>		<p>Filing Date: 3/31/2003</p>
<p>Group: 3624</p>		

U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate

FOREIGN PATENT DOCUMENTS

Document Number	Date	Country	Class	Subclass	Translation	
					Yes	No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

	APT Brochure, LIFFE Exchange, circa 1990*
	Trading Screen, INTEX of Bermuda, circa 1984*
	Weber, Information Technology in the Major International Financial Markets, April 7, 1993
	Trading Screen, TIFFE Exchange, circa 1989-1990*
	Trading Screen, MEFF Exchange, circa 1990*
	Cavaletti, Order Routing Article, Futures Magazine, February 1997
	Aurora Article, CBOT, circa 1989*

<p>EXAMINER</p>	<p>DATE CONSIDERED</p>
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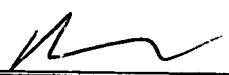
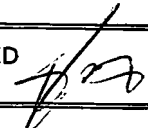
EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

FORM PTO-1449 (Rev. 2-32)	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. 02-211-B	Serial No. 10/403,881
		Applicant: Brumfield et al.	
		Filing Date: 3/31/2003	Group: 3624

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
 (Use several sheets if necessary)

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

	One Click Trading Options, Trading Technologies, circa 1998
	Trading Screen, SWX Exchange, circa 1990*
	Expanding futures and options trading around the world, around the clock, GLOBEX, circa 1989*
	Hansell, The computer that ate Chicago, Institutional Investor, February 1989
	Globex Report: An update on the CME Global electronic exchange, February 10, 1989
	NYMEX Access Documents, New York Mercantile Exchange, February 28, 1992
	CATS Traders' Manual, Toronto Stock Exchange, September 30, 1977
	Market Watch, Trading Screen, date not available
	Grummer, Peake, Sellers, Preliminary Feasibility Study, Bermudex Ltd., November 1980
	Peake, Mendellson, The ABCs of trading on a national market system, Appendix C of Preliminary Feasibility Study, Bermudex Ltd.; September 1997
	Peake, The last 15 meters, Appendix E of Preliminary Feasibility Study, Bermudex Ltd., June 15, 1997
	Declaration of Brendan Bradley in Case No. 04 C 5312, November 18, 2004
	Memorandum Opinion Published February 9, 2005, of Judge James B. Moran in Case No. 04 C 5312

EXAMINER 	DATE CONSIDERED 
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

Form PTO-1449	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. 02-211-B	Serial No. 10/403,881
INFORMATION DISCLOSURE STATEMENT BY APPLICANT		Applicant: Brumfield, et al.	
		Filing Date: March 31, 2003	Group: 3624

U.S. PATENT DOCUMENTS

Examiner Initial	No.	Document Number	Date	Name	Class	Subclass	Filing Date

FOREIGN PATENT DOCUMENTS

Examiner Initial	No.	Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
		WO 00/64176	10-26-00	PCT				
		WO 01/01077	1-4-01	PCT				
		WO 01/71557	9-27-01	PCT				
		WO 03/017062	2-27-03	PCT				

OTHER DOCUMENTS - Including Author, Title, Date, Pertinent Pages, Etc.

Examiner Initial	No.	Document
		Search Report issued by the Australian Patent Office for SG 200406082-8

Examiner	Date Considered
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AMINER: Initial if citation considered whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with any communication.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Case No. 02-211-Z6)

Appl. No. : 11/417,547 Confirmation No. 8101
Applicant: : Jens-Uwe Schluetter
Filed : 05/03/2006
TC/A.U. : 3693
Examiner : Richard C Weisberger

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO THE OFFICE ACTION
MAILED APRIL 26, 2007

Dear Examiner,

In response to the Office Action of April 26, 2007, Applicant submits the following:

Claims begin on page 2 of this paper

Remarks/Arguments begin on page 6 of this paper.

Listing of Claims

1. (Currently amended). A method for automatically positioning information related to a commodity on a graphical user interface, the method comprising:
 - receiving market information relating to the commodity from an electronic exchange, the market information comprising a plurality of bids and asks ~~items of interest~~, wherein each bid and each ask is item of interest associated with a price;
 - displaying an information display region comprising a plurality of locations arranged such that each location corresponds to a price level along ~~at least a portion of a static~~ a price axis;
 - displaying a plurality of indicators at a first time, each indicator is associated with a bid or an ask, an item of interest and each indicator being displayed in one of the plurality of locations in the information display region corresponding to a price level that is associated with the bid or the ask item of interest; and
 - displaying a working order indicator at the first time, the working order indicator is associated with a user's order working at the electronic exchange, and the working order indicator being displayed at a location in the information display region corresponding to a price level that is associated with the user's order, wherein an electronic message to cancel the user's order is sent to the electronic exchange in response to the working order indicator being selected through a single action of a user input device; and
 - automatically repositioning the ~~static~~ price axis upon detecting a predetermined condition such that the plurality of locations of the information display region corresponds to a different portion of the ~~static~~ price axis at a second time;
 - wherein each of the plurality of indicators, including the working order indicator, is moved to a new location in the information display region that corresponds to the price level on the ~~static~~ price axis that is associated with that indicator.

2.-34. (Cancelled).

35. (New) The method of claim 1, further comprising displaying an order entry region comprising a plurality of areas for receiving commands to send trade orders, each location corresponding to a price level along the price axis.

36. (New) The method of claim 35, further comprising 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 price for a trade order and sending the trade order having a default quantity to the electronic exchange.

37. (New) The method of claim 36, wherein the single action to send the trade order consists of a single click of the user input device.

38. (New) The method of claim 36, wherein the single action to send the trade order consists of a double click of the user input device.

39. (New) The method of claim 1, wherein the single action to send the electronic message to cancel the user's order consists of a single click of the user input device.

40. (New) The method of claim 1, wherein the single action to send the electronic message to cancel the user's order consists of a double click of the user input device.

41. (New) The method of claim 1, further comprising removing the working order indicator from the information display region when the user's order is canceled from the electronic exchange.

42. (New) The method of claim 1, wherein the working order indicator represents a single order entered by the user at a price level.
43. (New) The method of claim 1, wherein the working order indicator represents a plurality of orders entered by the user at a price level.
44. (New) The method of claim 1, wherein the working order indicator dynamically indicates the quantity of the user's order being worked at the electronic exchange.
45. (New) The method of claim 1, wherein the working order indicator dynamically indicates the quantity of the user's order that has been filled at the electronic exchange.
46. (New) The method of claim 1, further comprising defining the predetermined condition such that the price axis is automatically repositioned when an inside market price is at a certain location within the information display region.
47. (New) The method of claim 1, further comprising defining the predetermined condition such that the price axis is automatically repositioned when a last traded price is at a certain location within the information display region.
48. (New) The method of claim 1, further comprising defining the predetermined condition such that the price axis is automatically repositioned when an inside market price goes out of view of the information display region.
49. (New) The method of claim 1, further comprising defining the predetermined condition such that the price axis is automatically repositioned when a last traded price goes out of view of the information display region.

50. (New) The method of claim 1, further comprising defining the predetermined condition such that the price axis is automatically repositioned when an inside market price is a designated number of price levels away from the top or bottom of the information display region.

51. (New) The method of claim 1, further comprising defining the predetermined condition such that the price axis is automatically repositioned when a last traded price is a designated number of price levels away from the top or bottom of the information display region.

52. (New) The method of claim 1, further comprising defining the predetermined condition such that the price axis is automatically repositioned on a timed interval.

53. (New) The method of claim 1, further comprising receiving a manual repositioning command to reposition the price axis.

54. (New) The method of claim 1, wherein the plurality of bids and asks comprises a highest bid price and a lowest price currently available for the commodity.

REMARKS

Applicant thanks Examiner for the thorough examination. In response to the Office Action mailed April 26, 2007 (“Office Action” as used herein), Applicant respectfully presents the following remarks.

Claims 1 and 35-54 are currently pending. This response adds claims 35-54, which depend from independent claim 1. Claim 1 is directed to automatically positioning information that includes a “working order indicator.” Particularly, claim 1 is amended to further recite, “displaying a working order indicator [that]...is associated with a user’s order working at the electronic exchange...wherein an electronic message to cancel the user’s order is sent to the electronic exchange in response to the working order indicator being selected through a single action of a user input device...” Applicant submits that support for the claim 1 amendment and these new claims is in the disclosure as originally filed, and therefore no new matter is added.

On page 2 of the Office Action, claim 1 has been rejected under 35 U.S.C. § 112, second paragraph. At the very least, Applicant traverses this rejection based on the belief that one of ordinary skill would clearly understand what is claimed by “static” as used in the context of the claim, and even further when the claim is read in light of the specification. Applicant believes that the rejection is moot, however, in view of the present amendment that eliminates the “static” feature.

On page 2 of the Office Action, claim 1 has been rejected under 35 U.S.C. § 102(b) as being anticipated by Next-Generation Futures Options Trading System. Applicant respectfully traverses these rejections based on at least the remarks given below.

I. Claim Rejection under 35 U.S.C. § 102

The Office cites to Chapter 7, section 7-3-2 of Next-Generation Futures Options Trading System (“TSE”) as disclosing the features of previously presented claim 1. While Applicant traverses this rejection based on at least the fact that it is not clear from the manual whether or not TSE discloses a “static

price axis” among other features of the previously presented claim 1, the amended claim 1 includes a combination of features that is both novel and nonobvious in view of the cited art. Thus, while it is uncertain that TSE even qualifies as prior art or that it contains features of the previously presented claims, the amendment puts the method of claim 1, presented as a whole, in condition for an allowance.

As amended, claim 1 calls for an “information display region” that combines the display of a “plurality of indicators..., each indicator is associated with a bid or an ask” *and* a “working order indicator...associated with a user’s order working at the electronic exchange.” According to claim 1, an electronic message to cancel the user’s order is sent to the electronic exchange in response to the working order indicator being selected through a single action of a user input device. Claim 1 further calls for automatically repositioning the price axis wherein each of the “plurality of indicators, including the working order indicator, is moved to a new location in the information display region.”

A review of TSE, including section 7-3-2, reveals no such disclosure of the aforementioned features. Accordingly, favorable reconsideration and withdrawal of the rejection of independent claim 1 under 35 U.S.C. 102(b) are respectfully requested. Claims 35-54 are allowable for at least the same reasons as independent claim 1 is allowable, in addition to the added features they each recite.

II. Conclusion

In view of the foregoing, Applicant respectfully submits that the independent claims patentable define the presently claimed invention over the citations of record. Further, the dependent claims should also be allowable for the same reasons as their respective base claims and further due to the additional features they recite. Separate and individual consideration of the dependent claims is respectfully requested. If Examiner believes that further dialog would expedite consideration of the application, Examiner is invited to

contact Trading Technologies in-house Patent Counsel Mark Triplett at 312-476-1151, or the undersigned attorney or agent.

Respectfully submitted,

Date: July 25, 2007

By: /Joseph Herndon/
Joseph A. Herndon
Reg. No. 50,469

Electronic Patent Application Fee Transmittal

Application Number:	11417547			
Filing Date:	03-May-2006			
Title of Invention:	System and method for automatic repositioning of market information in a graphical user interface			
First Named Inventor/Applicant Name:	Jens-Uwe Schluetter			
Filer:	Joseph Allen Herndon			
Attorney Docket Number:	02-211-Z6			
Filed as Large Entity				
Utility Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Claims in excess of 20	1202	1	50	50
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:	0156			

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
Total in USD (\$)				230

Electronic Acknowledgement Receipt

EFS ID:	2008917
Application Number:	11417547
International Application Number:	
Confirmation Number:	8101
Title of Invention:	System and method for automatic repositioning of market information in a graphical user interface
First Named Inventor/Applicant Name:	Jens-Uwe Schluetter
Customer Number:	39310
Filer:	Joseph Allen Herndon
Filer Authorized By:	
Attorney Docket Number:	02-211-Z6
Receipt Date:	25-JUL-2007
Filing Date:	03-MAY-2006
Time Stamp:	15:36:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment was successfully received in RAM	\$230
RAM confirmation Number	788
Deposit Account	132490

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:
Charge any Additional Fees required under 37 C.F.R. Section 1.16 and 1.17

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Filed	02_211_Z6_IDS.pdf	228564 8675192a9b1ac9d37ee8af92bb3c2fce d41547e8	no	2
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
2	NPL Documents	OA_Reference.pdf	815620 dedebbec288062e273c76f1c27d6e0b2 3057b42a	no	15
Warnings:					
Information:					
3		02_211_Z6_Response_4_26_07.pdf	91518 f40e1d9524a586545e925813cc737128 a6667ce4	yes	8
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment - After Non-Final Rejection		1	1	
	Claims		2	5	
	Applicant Arguments/Remarks Made in an Amendment		6	8	
Warnings:					
Information:					
4	Fee Worksheet (PTO-06)	fee-info.pdf	8347 5eb3800e5d15939f03912a5d495f188e3 66df8bd	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			1144049		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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Alexandria, Virginia 22313-1450
www.uspto.gov

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO, CONFIRMATION NO.
10/125,894 04/19/2002 Gary Allen Kemp II 02-211 4067

39310 7590 03/23/2007
MBHB/TRADING TECHNOLOGIES
300 SOUTH WACKER DRIVE
SUITE 3200
CHICAGO, IL 60606

Table with 1 column: EXAMINER
GREENE, DANIEL LAWSON

Table with 2 columns: ART UNIT, PAPER NUMBER
3694

Table with 3 columns: SHORTENED STATUTORY PERIOD OF RESPONSE, MAIL DATE, DELIVERY MODE
3 MONTHS 03/23/2007 PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.	Applicant(s)	
10/125,894	KEMP ET AL.	
Examiner	Art Unit	
Daniel L. Greene Jr.	3694	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133)
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b)

Status

- 1) Responsive to communication(s) filed on 27 December 2006.
- 2a) This action is **FINAL**.
- 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 46-65 is/are pending in the application.
4a) Of the above claim(s) 48, 52, 54 and 59-65 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 46, 47, 49-51, 53 and 55-58 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

1. Claims 46-65 are pending. Claims 48, 52 and 59-65 are withdrawn as directed towards a non-elected invention. An action on the merits of claims 46, 47, 49-51, 53-58 is presented below.

Election/Restrictions

2. Applicant's election with traverse of Group I, the embodiment set forth in Figure 11 A&B, species 6a, 7a wherein the second indicator comprises a graphical indicator in the reply filed on 12/27/2006 is acknowledged. The traversal is on the ground(s) that "Each claim in all three groups includes specific limitations directed to displaying information related to a commodity on a graphical user interface" (See second to last paragraph on page 6). This is not found persuasive because the Examiner has shown that inventions are indeed distinct as the process can be performed by another materially different apparatus, can be practiced by hand AND the apparatus claimed can be used to practice another and materially different process, See MPEP 806.05(e). Further the groups have acquired a separate status in the art as shown by their different classifications. Mirroring the claim language between method and apparatus does not overcome the requirement for restriction when the apparatus themselves are capable of practicing other and materially different processes. Indeed, a review of the language of claims 59-64 and 65 indicates that applicant is attempting to claim a computer readable medium (known in the computer art as a floppy disk, cd-rom, hard drive, zip drive, jazz drive etc.) and a system for displaying information. The intended uses of these

Art Unit: 3694

apparatuses does not in and of itself make them patentable by applicant, that is, the claim language is such that it appears applicant is attempting to claim, for example, merely a cd-rom and/or the internet itself (i.e. a system for displaying information).

The requirement is still deemed proper and is therefore made FINAL.

3. Note that applicant elected the embodiment of figure 11A and 11B, which the Examiner failed to indicate as one of the embodiments of section 5 of the restriction requirement. The Applicant and Examiner discussed this oversight on December 20, 2006 and the Examiner agrees that said figure should have been indicated in said Restriction requirement. Accordingly, said election is proper.

4. Regarding Applicant's argument surrounding the single species election of section 8 of said Restriction requirement, it must be noted that the Examiner in no way required the alteration of the language of claims 54 and 64, merely the election of a single embodiment disclosed therein as per MPEP 809.02(a)[R-3](C) "(C) Applicant should then be required to elect a single disclosed species..." Again, the use of the term "consisting" was only in response to the restriction requirement in order to present only ONE species to be examined on the merits. The use of terms such as comprising in an election requirement is considered open-ended and would NOT have fulfilled the requirement for electing a single species. Applicant's amendment to the claim indicates the desire to prosecute the species wherein the second indicator consists of a graphical indicator. Accordingly an action on the merits of claims 46, 47, 49-51, 53-58 follows.

Specification

5. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

6. **The abstract of the disclosure is objected** to because it is so generic and short that it is of no apparent value. That is, the abstract speaks nothing to the invention set forth in the claims, i.e. what information is displayed, how and in what manner such is displayed, etc.

Correction is required. See MPEP § 608.01(b).

7. **The disclosure is objected to because of the following informalities:**

On page 32, paragraph [00113], the last full sentence, the word "indicator" is misspelled as "indictor".

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Appropriate correction is required.

8. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

11. Claims 46, 47, 49-51, 53-58 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claim 46 is vague, indefinite and incomplete in what all is meant by and encompassed by the phrase "when the price that the first indicator represents changes" because the claim only refers to a "price level" not a "price". Since the term price is not considered as connoting the same meaning as "price level" the metes and bounds of the claim are undefined.

b. Claim 46 is vague, indefinite and incomplete in what all is meant by and encompassed by the phrase "display region of the graphical user interface, each

location in the second display region corresponding to a price level along the price axis” because the claim does not explicitly state that “the price axis” is the same price axis as set forth in the second full limitation of the claim. That is, the claim can be interpreted to read that there are two separate and distinct price axis, i.e. one in the first plurality of locations and one in the second plurality of locations. Since it is unclear exactly what price axis the limitation “the price axis” is referring, or where exactly the price axis is located, the metes and bounds of the claim are undefined.

c. Claim 57 is vague, indefinite and incomplete in what all is meant by and encompassed by the limitations that follow the term “if” because it is unclear what happens if the condition is not satisfied. Accordingly the metes and bounds of the claim are undefined. See MPEP §2106 II C and *In re Collier*, 158 USPQ 266 (CCPA 1968) “It has been held that actions that may or may not be done is indefinite and does not distinguish the claim from the prior art”

Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 46, 47, 49-51, 53-58 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over;

- a. **Claims 1-11 of U.S. Patent No. 7,127,424,**
- b. **Claims 1-26 of U.S. Patent No. 6,766,304,**
- c. **Claims 1-7 of U.S. Patent No. 6,772,132, and**
- d. **Claims 1-11 of U.S. Patent No. 6,938,011**

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application are a more generic than the claims set forth in said patents. It is not seen wherein applicant has presented claims that define over the inventions set forth in each and every one of the patents listed above. It is apparent on its face that applicant is merely claiming the same inventive concept using different words, however the end results are the same.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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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 to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 46, 47, 49-51, 53, 54 and 56-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over NPL Reference REFCO 0006679 "Next Generation Futures Options Trading System Participants Seminar Materials" Sept. 1997 submitted with IDS dated 1/25/2007 in view of Kharouf et al. "A Trading room with a view" and further in view of admitted prior art.

REFCO sets forth the figure below which indicates a method of displaying information relating to a commodity on a graphical user interface comprising a first indicator (12) in one of a plurality of locations corresponding to a price level and a price level axis (11), displaying a second indicator (17) in one of a second plurality of locations.

①		②		③			
Contin- uous	01	Long Term Gov. Bond 012	Basic	13296			
④ K13320 (13:17) (2012)				⑤	▲	H	▼
⑧	10	250	At Close	250	⑧	15	Morning and
⑨	Cautious		At Market	10	1	⑩	Afternoon Session
							⑪
	157	1810	OVER				0 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			13023 # ⑮		5	(13:16)
				13022			(2021)
				13021			G +13
	10			13020 K ⑮			V 42588
				13019	17	3	L5 13005 ⑱
				13018	47	1	(13:14)
				13017	5	6	L4 13008
				13016	36	3	(13:15)
				13015	44	6	2 L3 13009
				13014	46	2	(13:15)
				13013	123	5	L2 13008
				13012	141	3	(13:16)
				13011	2	4	L1 13009
				13010	817	3	(13:16)
				UNDER	6084	169	W 5 ⑳

REFCO 0006707

7-17

TSE0000000637

REFCO does not appear to specifically disclose linking a software application configured for computing a specific price to the second display region, nor that the indicators move relative to the price axis when the prices change.

Kharouf et al. sets forth on for example, page 11 the third and second to last paragraphs "The RTS system also provides tick-by-tick charting with basic tools, such as...moving averages" and "Traders can view options volatility and set parameters that automatically trigger trades based on theoretical values."

On page 31 of the specification as filed, Applicant states "Data exchange protocols in general, and linking and embedding techniques in particular, are well known to those skilled in the art."

At the time of the invention it would have been obvious to one of ordinary skill in the art to have combined the teachings of Kharouf concerning moving averages with the system set forth in REFCO to arrive at an indicator that moves relative to the price axis for the benefit of, for example, accurately depicting the current average of a commodities price in real time in order for a trader to make decisions regarding the purchase or sale of said commodities. Further as stated by applicant himself, "linking and embedding are well known to those skilled in the art", therefore it would have been obvious to link a specific software application configured for computing a specific price and to display that price in a second region for the benefit of observing or making visible the "set parameters that automatically trigger trades based on theoretical values" as taught by Kharouf.

Claims 47, 49 and 50 are disclosed in the rejection of corresponding parts above, specifically in that Applicant has stated that "Data exchange protocols in

general, and linking and embedding techniques in particular, are well known to those skilled in the art.”

Claim 51 is clearly disclosed in the figure above.

Claim 53 is disclosed in the combination as set forth above in the rejection of corresponding parts wherein it is understood that as orders are filled the chart will be automatically updated to reflect the most current commodity availability.

Claims 56-58 are disclosed in, for example, REFCO wherein it is understood that the process of selecting, i.e. clicking in the desired region (e.g. buy or sell) causes the program to commence the buy or sell process which includes sending the respective trade order. The limitations “based on a default quantity parameter” is nothing more than a design choice, which is considered well known in the computer software art, i.e. to allow the selection of repetitive information without having to retype in the repetitive data.

16. Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over NPL Reference REFCO 0006679 “Next Generation Futures Options Trading System Participants Seminar Materials” Sept. 1997 submitted with IDS dated 1/25/2007 in view of Kharouf et al. “A Trading room with a view” and further in view of admitted prior art as applied to claims 46, 47, 49-51, 53-58 above and further in view of DaCosta et al. (U.S. Patent No. 6,826,533) (DaCosta)

The references show the inventive concept as set forth above, however the references do not appear to explicitly teach modifying one or more quote

display format settings associated with the quote, wherein the quote display format comprises a font color setting, a font size setting, or a font style setting.

DaCosta teaches modifying one or more quote display format settings associated with the quote, wherein the quote display format comprises a font color setting, a font size setting, or a font style setting (col. 6, lines 14-31). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combination above to include the aforementioned steps as taught by DaCosta. One would have been motivated to do this in order to present the user with a font attribute that changes when a quote is updated in order to draw their attention to said change.

Allowable Subject Matter

17. A review of the application history appears to indicate allowable subject matter in certain specific limitations set forth in the claims of previous patents issued to the instant Assignee. It would appear that the addition of the limitation "wherein the method in combination includes consolidating the price levels of the common static price axis such that a plurality of price levels are combined into a consolidated price level." to all of the dependant claims would render the claims patentable.

18. Caveat, this is of course dependant on applicant's ability to overcome the rejections set forth within this instant Office action. Specifically the Double Patenting rejection.

Conclusion

19. Examiner's Note: The Examiner has cited particular columns and line numbers in the references as applied to the claims for the convenience of the applicant.

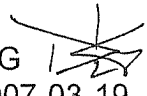
Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant, in preparing the responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

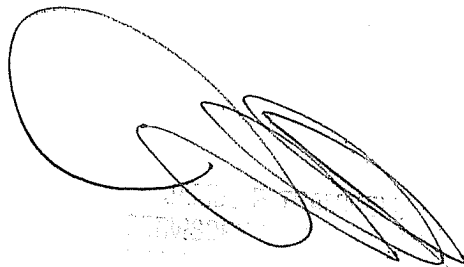
20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel L. Greene Jr. whose telephone number is (571) 272-6876. The examiner can normally be reached on Mon-Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James P. Trammell can be reached on (571) 272-6712. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3694

21. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DIG 
2007-03-19



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/417,547	Filing Date 05/03/2006	<input type="checkbox"/> To be Mailed
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APPLICATION AS FILED – PART I			OTHER THAN SMALL ENTITY				
	(Column 1)	(Column 2)	SMALL ENTITY <input type="checkbox"/>	OR			
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE <small>(37 CFR 1.16(a), (b), or (c))</small>	N/A	N/A	N/A			N/A	
<input type="checkbox"/> SEARCH FEE <small>(37 CFR 1.16(k), (l), or (m))</small>	N/A	N/A	N/A			N/A	
<input type="checkbox"/> EXAMINATION FEE <small>(37 CFR 1.16(o), (p), or (q))</small>	N/A	N/A	N/A			N/A	
TOTAL CLAIMS <small>(37 CFR 1.16(i))</small>	minus 20 =	*	X \$ =		OR	X \$ =	
INDEPENDENT CLAIMS <small>(37 CFR 1.16(h))</small>	minus 3 =	*	X \$ =			X \$ =	
<input type="checkbox"/> APPLICATION SIZE FEE <small>(37 CFR 1.16(s))</small>	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT <small>(37 CFR 1.16(j))</small>							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II					OTHER THAN SMALL ENTITY				
	(Column 1)	(Column 2)	(Column 3)		SMALL ENTITY	OR			
AMENDMENT	07/25/2007	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)
	Total <small>(37 CFR 1.16(i))</small>	* 21	Minus ** 34	= 0	X \$ =		OR	X \$50=	0
	Independent <small>(37 CFR 1.16(h))</small>	* 1	Minus *** 3	= 0	X \$ =		OR	X \$200=	0
	<input type="checkbox"/> Application Size Fee <small>(37 CFR 1.16(s))</small>								
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <small>(37 CFR 1.16(j))</small>						OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

	(Column 1)	(Column 2)	(Column 3)		SMALL ENTITY	OR		
AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)
	Total <small>(37 CFR 1.16(i))</small>	*	Minus **	=	X \$ =		OR	X \$ =
	Independent <small>(37 CFR 1.16(h))</small>	*	Minus ***	=	X \$ =		OR	X \$ =
	<input type="checkbox"/> Application Size Fee <small>(37 CFR 1.16(s))</small>							
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <small>(37 CFR 1.16(j))</small>						OR	
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
 carol barnes

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
 If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/417,547 05/03/2006 Jens-Uwe Schluetter 02-211-Z6 8101

39310 7590 10/18/2007
MBHB/TRADING TECHNOLOGIES
300 SOUTH WACKER DRIVE
SUITE 3200
CHICAGO, IL 60606

EXAMINER

WEISBERGER, RICHARD C

ART UNIT	PAPER NUMBER
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3693

MAIL DATE	DELIVERY MODE
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10/18/2007 PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 11/417,547	Applicant(s) SCHLEUTTER ET AL.	
	Examiner Richard C. Weisberger	Art Unit 3693	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1 and 35-54 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1 and 35-54 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 3693

DETAILED ACTION

Claim Rejections - 35 USC § 112

Claims 1 and 35-54 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the claims a “working order” is indefinite in scope.

Claims 1 and 35-54 would be allowable upon overcoming the above rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard C. Weisberger whose telephone number is 571 272 6753. The examiner can normally be reached between 6:30 AM to 10:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jim Trammel can be reached on 571 272 6712. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3693

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Richard C Weisberger
Primary Examiner
Art Unit 3693



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/417,547

05/03/2006

Jens-Uwe Schluetter

02-211-Z6

8101

39310 7590 10/18/2007
MBHB/TRADING TECHNOLOGIES
300 SOUTH WACKER DRIVE
SUITE 3200
CHICAGO, IL 60606

EXAMINER

WEISBERGER, RICHARD C

ART UNIT	PAPER NUMBER
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3693

MAIL DATE	DELIVERY MODE
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10/18/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

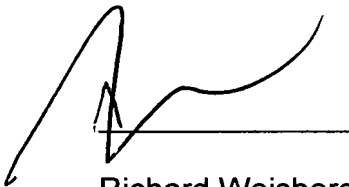
Art Unit: 3693

1. Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

The applicant is requested to contact the examiner regarding a demonstration of the claims invention.

2. This requirement is subject to the provisions of 37 CFR 1.134, 1.135 and 1.136 and has a shortened statutory period of two months. **EXTENSIONS OF THIS TIME PERIOD MAY BE GRANTED UNDER 37 CFR 1.136(a).**

and identify the properties of similar products and services found in the prior art.



Richard Weisberger

Primary Examiner

571 272 6753

James Kramer

SPE

Application/Control Number: 09/653,102
Art Unit: 3693

Page 3

Under the Paperwork Reduction Act of 1995 no Persons are required to respond to a collection of information unless it contains a valid OMR control number

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT***(Use as many sheets as necessary)***Complete if Known**

Application Number	11/417,547
Filing Date	May 3, 2006
First Named Inventor	Brumfield
Art Unit	3693
Examiner Name	Weisberger
Attorney Docket Number	02-211-Z6

Sheet 1 of 6

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
		us- 4,674,044	6-16-87	Kalmus	
		us- 4,751,035	6-7-88	Boilen	
		us- 4,903,201	2-20-90	Wagner	
		us- 5,038,284	8-6-91	Kramer	
		us- 5,077,665	12-31-91	Silverman	
		us- 5,101,353	3-31-92	Lupien	
		us- 5,136,501	8-4-92	Silverman	
		us- 5,270,922	12-14-93	Higgins	
		us- 5,297,031	3-22-94	Gutterman	
		us- 5,297,032	3-22-94	Trojan	
		us- 5,689,651	11-18-97	Lozman	
		us- 5,768,158	6-16-98	Adler	
		us- 5,774,877	6-30-98	Patterson	
		us- 5,793,301	11-8-98	Patterson	
		us- 5,797,002	8-18-98	Patterson	
		us- 5,845,266	12-1-98	Lupien	
		us- 5,873,071	2-16-99	Ferstenberg	
		us- 5,915,245	6-22-99	Patterson	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ "Number" ⁴ "Kind Code" ⁵ (if known)				
		WO 02/33621	4-25-02	Otero et al		
		WO 02/33623	4-25-02	Otero et al		
		WO 02/33636	4-25-02	Otero et al		
		WO 02/33637	4-25-02	Otero et al		
		WO 01/27843	4-19-01	Gilman et al		

Examiner Signature	Date Considered
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT***(Use as many sheets as necessary)***Complete if Known**

Application Number	11/417,547
Filing Date	May 3, 2006
First Named Inventor	Brumfield
Art Unit	3693
Examiner Name	Weisberger
Attorney Docket Number	02-211-Z6

Sheet 2 of 6

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
		us- 5,924,082	7-13-99	Silverman	
		us- 5,924,083	7-13-99	Silverman	
		us- 5,926,801	7-20-99	Matsubara	
		us- 5,946,667	8-31-99	Tull	
		us- 5,963,923	10-5-99	Garber	
		us- 6,012,046	1-4-00	Lupien	
		us- 6,035,287	3-7-00	Stallaert	
		us- 6,098,051	8-1-00	Lupien	
		us- 6,131,087	10-10-00	Luke	
		us- 6,134,535	10-17-00	Belzberg	
		us- 6,195,647	2-27-01	Martyn	
		us- 6,272,474	8-7-01	Garcia	
		us- 6,278,982	8-21-01	Korhammer	
		us- 6,282,521	8-28-01	Howorka	
		us- 6,697,099	2-24-04	Smith	
		us- 6,876,981	4-5-05	Berckmans	
		us- 7,127,424	10-17-06	Gordon et al	
		us- 7,155,410	12-26-06	Woodmansey	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ "Number" ⁴ "Kind Code" ⁵ (if known)				

Examiner Signature	Date Considered
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹Applicant's unique citation designation number (optional). ²See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶Applicant is to place a check mark here if English language translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Complete if Known

Application Number	11/417,547
Filing Date	May 3, 2006
First Named Inventor	Brumfield
Art Unit	3693
Examiner Name	Weisberger
Attorney Docket Number	02-211-Z6

Sheet 3

of 6

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
		US- 7,181,425	2-20-07	Cha	
		US- 2002/023038	2-21-02	Fritsch	
		US- 2002/0035534	3-21-02	Buist	
		US- 2002/0059129	5-16-02	Kemp	
		US- 2002/0073017	6-13-02	Robertson	
		US- 2002/0099644	7-25-02	Kemp	
		US- 2002/0120551	8-29-02	Jones	
		US- 2002/0138401	9-26-02	Allen	
		US- 2002/0046146	4-18-02	Otero et al	
		US- 2002/0046149	4-18-02	Otero et al	
		US- 2002/0046151	4-18-02	Otero et al	
		US- 2002/0049661	4-25-02	Otero et al	
		US- 2003/0023536	1-30-03	Hollerman et al	
		US- 2003/0023542	1-30-03	Kemp et al	
		US- 2003/0126065	7-3-03	Eng	
		US- 2005/0262003	11-24-05	Brumfield et al	
		US- 2006/0265303	11-23-06	Kemp et al	
		US- 2006/0259382	11-16-06	Kemp et al	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ "Number" ⁴ "Kind Code" ⁵ (if known)				

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SignatureDate
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT***(Use as many sheets as necessary)***Complete if Known**

Application Number	11/417,547
Filing Date	May 3, 2006
First Named Inventor	Brumfield
Art Unit	3693
Examiner Name	Weisberger
Attorney Docket Number	02-211-Z6

Sheet 4 of 6

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
		us- 5,675,746	10-7-97	Marshall	
		us- 5,774,878	6-30-98	Marshall	
		us- 6,014,643	1-11-00	Minton	
		us- 6,073,115	6-6-00	Marshall	
		us- 6,161,098	12-12-00	Wallman	
		us- 6,516,303	2-4-03	Wallman	
		us- 2002/0055899	5-9-02	Williams	
		us- 2002/0178096	11-28-02	Marshall	
		us- 2003/0004852	1-2-03	Burns	
		us- 2003/0004853	1-2-03	Ram	
		us- 2003/0009411	1-9-03	Ram	
		us- 2003/0097325	5-22-03	Friesen	
		us- 2003/0200167	10-23-03	Kemp	
		us- 2003/0236737	12-25-03	Kemp	
		us- 2003/0065608	4-3-03	Cutler	
		us- 2004/0093300	5-13-04	Burns	
		us- 2004/013054	5-27-04	Singer	
		us- 2004/0117292	6-17-04	Brumfield	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	† ⁶
		Country Code ³ "Number" ⁴ "Kind Code" ⁵ (if known)				

Examiner
SignatureDate
Considered

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT***(Use as many sheets as necessary)*

Sheet 5

of 6

Complete if Known

Application Number	11/417,547
Filing Date	May 3, 2006
First Named Inventor	Brumfield
Art Unit	3693
Examiner Name	Weisberger
Attorney Docket Number	02-211-Z6

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		Number-Kind Code ² (if known)			
		us- 2006/0259383	11-16-06	Kemp et al	
		us- 2006/0271475	11-30-06	Brumfield et al	
		us- 2006/0259384	11-16-06	Schluetter et al	
		us- 2006/0265304	11-23-06	Schluetter et al	
		us- 2006/0259404	11-6-06	Brumfield	
		us- 7,181,424	2-20-07	Ketchum et al.	
		us- 2003/0069834	4-10-03	Cutler	
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Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>				Complete if Known	
				Application Number	11/417,547
				Filing Date	May 3, 2006
				First Named Inventor	Brumfield
				Art Unit	3693
				Examiner Name	Weisberger
Sheet	6	of	6	Attorney Docket Number	02-211-Z6

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		NASDAQ Workstation II User Guide, Guide to Enhancements for NASDAQ Workstation II Software Release (April 1998) as viewed on the Internet Achieves http://web.archive.org/web/20031208041112/nasdaqtrader.com/trader/tradingservices/productservices/userguides/nwliguide.pdf	
		International Search Report for PCT/US03/12201	
		Office Action issued by the USPTO on 6/26/07 for application serial no. 11/417,871	
		Pending U.S. patent application serial number 10/403,757 filed 3/31/03	
		Pending U.S. patent application serial number 10/125,894 filed 4/19/02	
		Pending U.S. patent application serial number 10,403,881 filed 3/31/03	
		MLT Trade Vizion, http://www.trade-vizion.com/modules.php?name+Products – 7/29/04	

Examiner Signature		Date Considered	
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¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL (Submitted Only via EFS-Web)

Application Number	11417547	Filing Date	2006-05-03	Docket Number (if applicable)	02-211-Z6	Art Unit	3693
First Named Inventor	Jens-Uwe Schluetter			Examiner Name	Weisberger		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
 Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

Other _____

Enclosed

Amendment/Reply

Information Disclosure Statement (IDS)

Affidavit(s)/ Declaration(s)

Other
 Cited Non U.S. Patent References and Response to 37 CFR 1.105 Request for Information

MISCELLANEOUS

Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
 (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to
 Deposit Account No 132490

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Patent Practitioner Signature

Applicant Signature

Signature of Registered U.S. Patent Practitioner

Signature	/Joseph A. Herndon/	Date (YYYY-MM-DD)	2008-02-26
Name	Joseph A. Herndon	Registration Number	50469

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
25 April 2002 (25.04.2002)

PCT

(10) International Publication Number
WO 02/33621 A1

(51) International Patent Classification⁷: **G06F 17/60**

(21) International Application Number: PCT/US01/31378

(22) International Filing Date: 9 October 2001 (09.10.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/241,807	14 October 2000 (14.10.2000)	US
09/773,139	31 January 2001 (31.01.2001)	US
09/823,125	30 March 2001 (30.03.2001)	US
09/872,687	31 May 2001 (31.05.2001)	US

(71) Applicant (for all designated States except US): **GOLD-MAN, SACHS & CO.** [US/US]; 85 Broad Street, New York, NY 10004 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **OTERO, Hernan, G.** [AR/US]; 20 Briarcliff Pl., Huntington, NY 11743 (US). **HORN, Steven, B.** [US/US]; 315 E. 65th Street #7L, New York, NY 10021 (US). **TUMILTY, John** [GB/US]; 105 Duane Street, Apt. #22B, New York, NY 10007 (US).

(74) Agent: **CHOVANES, Joseph, E.**; Dilworth Paxson LLP, 3200 Mellon Bank Center, 1735 Market Street, Philadelphia, PA 19103 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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(54) Title: COMPUTERIZED INTERFACE FOR CONSTRUCTING AND EXECUTING COMPUTERIZED TRANSACTION PROCESSES AND PROGRAMS

(57) Abstract: An interface primarily used in computerized trading processes. In the especially preferred embodiments, the interface comprises a first sub-interface that allows "plug ins" to be dynamically created and/or edited. The plug ins are executed by a logic engine in which uses various inputs and outputs to obtain necessary information, process the order, and execute the order. The interface can additionally comprise a second sub-interface used to track orders, as well as a third sub-interface used to monitor orders.

COMPUTERIZED INTERFACE FOR CONSTRUCTING AND EXECUTING COMPUTERIZED TRANSACTION PROCESSES AND PROGRAMS

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is related to provisional application U.S. Serial No. 60/241,807, by Steven B. Horn, John A. Fanelli, Hernan G. Otero and John Tumilty, which disclosure is incorporated herein by reference; and, co-pending U.S. Serial No. 09/823,125, entitled "APPARATUS, METHODS AND ARTICLES OF MANUFACTURE FOR CONSTRUCTING AND EXECUTING COMPUTERIZED TRANSACTION PROCESSES AND PROGRAMS" filed on 3/30/01, by Hernan G. Otero, Steven B. Horn and John Tumilty, which disclosure is incorporated herein by reference.

FIELD OF THE INVENTION

This invention relates to apparatus, methods and articles of manufacture for computerized transaction execution and processing. Particularly, this invention relates to an interface for a financial transaction execution and processing system. More particularly, this invention relates to a graphical user interface for a financial transaction execution and processing system.

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BACKGROUND OF THE INVENTION

Computerized transaction execution and processing requires an enormous, and often detrimental, amount of time and resources. The time and resources are required because, in most instances, execution and processing are based upon customized implementations of the transaction.

Customized transaction implementations require new programming. New programming requires cost and effort – not only for the first attempt, but also for the debugging and testing processes. Moreover, once the program is debugged and released, real world implementations require yet further testing and debugging.

All this effort takes resources and time. It takes resources because the programmers must first develop the program with input from the users, and then the users themselves must test the program in the field, to ensure reliable operation. The effort required means that the users may be too busy doing their job to assist in programming efforts. Thus the program may not ever be developed. Moreover, by the time any particular program is developed, the markets may have shifted away from the initial transactional conditions that first provided the impetus for developing the program. For example, specific trading strategies are usually constructed and executed on a customized basis, yet by the time the program is developed for those strategies, and those strategies are executed, they may be no longer useful.

The cost, effort and time factors are not solely the result of required programming. In trading transactions, the programmers must be advised by the traders or other business professionals regarding desired trading strategies and desired markets. These professionals are busy in their own right – they may have little or no time to advise the programmers on what new strategies and markets should be developed. Even if they can advise the programmers, trading strategies can become quite complex, and in order to communicate those strategies and implement those strategies effectively, the programmer and trader interactions cost time, money and resources.

Enterprise-wide customization adds yet another level of time, effort and complexity. What may be useful in one enterprise business unit may not be useful in another, and time, effort and resources may not be available to implement specific programs customized for each business unit.

Any implementations must be quite robust, and reliably and consistently execute trading strategies. The implementation of new computerized transactional programs must be as close to bullet proof as possible – failure of a trading program can mean losses in thousands, millions or even billions of dollars. Developing reliable implementations of trading programs means that testing procedures and recovery procedures must always be paramount considerations.

Finally, the interfaces to the programs used in trading systems need to be improved to provide improved functionality and ease of use.

Accordingly, it is an object of at least an embodiment of the invention to provide apparatus, methods and articles of manufacture for an interface for constructing and executing transactions.

It is a further object of at least an embodiment of this invention to provide open-ended apparatus, interfaces, methods and articles of manufacture for constructing and executing transaction processes and programs.

It is a further object of at least an embodiment of this invention to provide robust and reliable apparatus, methods and articles of manufacture for a user interface for implementing trading strategies.

The scope of the invention is not limited in any way by the objects. Further objects will become evident in the description that follows, and in part will be obvious from the description, or may be learned by practice of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic diagram of a preferred embodiment of the trading system.

Figure 2 is a schematic diagram of a preferred embodiment of the trading system.

Figure 3 is a screen shot of a preferred embodiment of the trading system.

Figure 4 is a screen shot of a preferred embodiment of the trading system.

Figure 5 is a screen shot of a preferred embodiment of the trading system.

Figure 6 is a schematic diagram of a preferred embodiment of the trading system.

Figure 7 is a schematic diagram of a preferred embodiment of the trading system.

Figure 8 is a flow chart of a preferred embodiment of the trading system.

Figure 9 is a flow chart of a preferred embodiment of the trading system.

Figure 10 shows components of a preferred embodiment of the trading system.

Figure 11A is a schematic diagram of a preferred embodiment of the trading system.

Figure 11B is a schematic diagram of a preferred embodiment of the trading system.

Figure 12 is a screen shot of a preferred embodiment of the trading system.

Figure 13 is a screen shot of a preferred embodiment of the trading system.

Figure 14 is a screen shot of a preferred embodiment of the trading system.
Figure 15 is a screen shot of a preferred embodiment of the trading system.
Figure 16 is a screen shot of a preferred embodiment of the trading system.
Figure 17 is a screen shot of a preferred embodiment of the trading system.
Figure 18 is a screen shot of a preferred embodiment of the trading system.
Figure 19 is a screen shot of a preferred embodiment of the trading system.
Figure 20 is a screen shot of a preferred embodiment of the trading system.
Figure 21 is a screen shot of a preferred embodiment of the trading system.

SUMMARY OF THE INVENTION

The present invention provides apparatus, interfaces, methods and articles of manufacture for open-ended construction and execution of computerized transaction processes. In the preferred embodiments, an engine is used in the trading system that permits "plug-ins" to be used for construction, modification and alteration of trading procedure execution. These plug-ins can be preconstructed, or constructed when appropriate, and applied to the engine when desired. The embodiments further comprise an interface used in computerized trading processes, which may configure, create and/or edit the plug ins for subsequent use in the engine; which may monitor and/or track orders executed through the system and otherwise; and which may monitor the order server.

In the especially preferred embodiments, the interface is comprised of three sub-interfaces: a first sub-interface that allows transactional algorithms to be dynamically created and/or edited and used as plug-ins; a second sub-interface that monitors and/or track orders executed through the system and otherwise, and a third sub-interface that monitors the order server. Each of the sub-interfaces, as well as the interface, may be further comprised of a graphical user interface.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiments of the present invention comprise an interface, connected to a trading system including an engine infrastructure, for open-ended construction and execution of computerized trading processes. Java is the preferred language, although other embodiments may be in other languages. Therefore, the embodiments may be used across a wide variety of networked platforms.

Figure 1 shows a schematic diagram of the engine infrastructure of a preferred embodiment. Written in Java, and present on the server, this software enables various data, plug-ins, applications, processes, and algorithms to be used in order to customize the trading process. These data, plug-ins, applications, processes, and algorithms are imported or plugged into the engine as desired in order to implement a particular trading strategy.

Seen in Figure 1 are various processes to be used in the engine 10. Area A of engine 10 symbolizes the area in which the plug-ins can be placed. Also seen at 10 is an area labeled "Market Specifics." This area, also supporting customization through data, plug-ins, applications, processes, and algorithms permits customization of any particular algorithm for any particular market in a manner explained in further detail below. In other embodiments, the plug-ins used for the various areas can be internal or external to the engine. Hereinafter, "plug-ins" will be used as a general term for data, plug-ins, applications, processes, and algorithms.

Engine 10, in this embodiment, provides services for the plug-ins. For example, most trading strategy plug-ins will need to access market data. Most trading strategy plug-ins will need to send orders to the exchange and be notified of executions, etc. Engine 10 provides these and other services to the plug-ins. For example in a preferred embodiment, engine 10 provides:

- A real time market data feed driver (e.g. Reuters SSL, TIB/Rendezvous feeds.)
- An exchange driver where the algorithm sends orders and receives executions back.
- A driver implementation that sends orders to one or more order management architecture(s) and/or system(s) server(s) is provided.
- An input driver which enters requests to the engine 10.

Figure 2 shows Process 1 implemented in engine 10. Process 1 might be a trading process such as Volume-Weighted-Average-Price or VWAP. The VWAP algorithm used in this embodiment, attempts to match the VWAP for a given instrument, such as an equity throughout a specified lifespan (e.g. throughout the full trading day). VWAP will maintain a number of limit orders in the market at different price levels. In order to trade according to the VWAP algorithm of this embodiment, the engine will listen to market

data throughout the day and access a volume profile to match the day's VWAP as close as possible.

The trader will then be able to review, thorough his screen, the order as it is being executed according to the VWAP algorithm. Any updates and/or changes will be simply made through his or her screen.

If a second VWAP algorithm was desired to be used, such as one that is based on theoretical values to trading, this second plug-in can be substituted for the first in the engine. This second plug-in will then be used by the engine.

Returning to Figure 2, the Market Specifics plug-in 1 has been chosen. Market specifics provide specific variables, data and other plug-ins necessary for the specific market in which the embodiment is being used. For example, they may be different limits on trading volume in one market versus another. The preferred embodiments permit configuration and modification of these Market Specifics, by plug-ins, so that they may be used in a variety of markets as desired.

In the preferred embodiments, the plug-ins comprise two types. The first type comprise algorithms used in trading. The second type comprise market-specific rules. Thus, for example, in the preferred embodiments, the engine can be configured with a specific algorithm, such as a first VWAP algorithm and for a specific market for a first trade such as the New York Stock Exchange and then modified for another specific algorithm such a Ratio algorithm and another specific market such as the Tokyo Stock Exchange for a second trade. In the especially preferred embodiments, the engine will carry out a number of trades using a specific algorithm, which has been chosen from a set of preconfigured algorithms. The algorithm used may be parameterized by the trader, in order to execute specific trades for a specific stock, price and number of shares. In these embodiments, the algorithm plug-in used is usually consistently used for that implementation of the embodiment during that particular trading period – whether it be an hour, day, week, etc. Of course, other embodiments may change their algorithm during any particular trading period. Moreover, the especially preferred embodiments usually maintain the market plug-in for at least the trading period, and usually longer. A trader, for example, may trade exclusively on the New York Stock Exchange using a preferred embodiment. Note that, using the especially preferred embodiments, the trader will change the algorithm plug-in, embodying his or her trading strategy, much more

frequently than his or her market plug-in, as he or she may only trade in a particular market. Network or enterprise wide implementations, however, will use the market plug-in in order to configure any particular implementations for traders in the various trading markets.

This embodiment also effectively provides real-time monitoring of the order by the trader as well as others such as the sales force who desire to monitor the order and its execution. Additionally, orders are fully integrated, and so the trader or others may override individual orders through the system of this embodiment, without an additional messaging system. Similarly, any changes to an order, such as size of the order or a price limit or volume can be echoed to the system of this embodiment and the system will automatically adjust its trading to the new parameters.

Various screen shots of the administration and monitoring tool GUI (written in Java, using Swing) used in a preferred embodiment are shown at Figures 3 through 5. These are an Order Tracker screen shown in Figure 3, an Algorithm Configuration screen shown in Figure 4, and an Order Details screen shown in Figure 5. This tool allows for configuring algorithms as well as monitoring the server. This tool may be installed on either or both of the client and server machines and on more than one machine in the networked environment.

In the preferred embodiments, an algorithm is comprised of an Algorithm Context, which may be a Java Class, plus a set of event-action mappings. These algorithms are usually written by a programmer. The mappings may be modified by non-programmers (e.g. a trader) via the graphical tool. The mappings provide a powerful way to fine tune the algorithm. Of course other embodiments may modify the mappings in a different fashion. For example, the programmer may provide the trader or other end user with objects that constitute events, conditions and actions. The trader can then construct his or her own algorithms which are plugged into the invention in order to provide the trader with an automatic execution mechanism.

Other algorithms that may be used in this embodiment include:

Ratio which tries to buy an instrument and sell a related instrument when the price between the two is more favorable than a specified ratio.

Gamma Hedge which hedges a portfolio and tries to capture volatility while doing so.

Aggressive Short Sell which tries to short sell a given instrument by making sure the Tokyo short sell rule is not violated.

Stop Loss which allows sending stop loss orders to exchanges that do not support this concept.

Iceberg which tries to trade a specified number of shares by sending only a part of the total order's quantity (the tip of the iceberg) to the market at any given time.

Auto Trader which decides whether to send trades to the market or fill from an account.

CB Delta Hedge which sends out underlyer market orders to hedge CB trades.

Of course, other algorithms or plug-ins may be used. Additionally, in the preferred embodiments, preferred methods of constructing and implementing new plug-ins are used. The preferred embodiments also use several Java features, e.g. introspection, reflection and the like, in order to automatically discover properties of the imported algorithms.

If new algorithms are desired, a number of methods can be used to create the algorithm. In this embodiment, if the new algorithm requires no Java code, then the algorithm can be created by leveraging on existing algorithm context classes. Specific classes have been established or predetermined in the preferred embodiments. If the new algorithm is simple enough, it can be created without writing any Java code, making use of the Administrator GUI as described below. This can be done by simply creating a set of event-action mappings that will work on a pre-existing algorithm context class (e.g. the base AlgorithmContext class that is part of the preferred embodiments code classes).

Figures 6 and 7 show how various mappings or parts may be used to construct combinations. Those combinations, constructed in Figure 3, are then inserted into the engine 20 in Figure 7. Note that a different Market Specifics plug-in, Market Specifics 2, has been chosen in Figure 7. These Market Specifics plug-ins may be from a predetermined set. In the especially preferred embodiments, the market plug-in is usually maintained over some static trading period. A trader, for example, may trade exclusively on the New York Stock Exchange, using the market plug-in. In enterprise installations, the market plug-ins may be set for the particular trading markets across the enterprise, and remain as set for a predetermined or static period of time.

Fundamental classes within the architecture of the preferred embodiment are:

- AlgorithmContext,
- Action,
- ActionBindings,
- ActionDispatcher.

If the new algorithm requires writing new code, the fundamental classes within the architecture of the preferred embodiment are: AlgorithmContext, Action, ActionBindings, ActionDispatcher. New Actions might be needed, for new complex algorithms, in order to do simple tasks that the existing actions can not deal with. Algorithms which require saving state during the execution of the order, for example, need to have their own Algorithm Context subclass. The data will then be kept in this new subclass.

The following process is used in the preferred embodiment to write code for a new algorithm. A Simple Algorithm Context must be written, starting with a template of what the class should look like, providing an empty, public constructor, adding in member variables, and providing a public getter/setter pair. Since this preferred embodiment makes use of beans support classes to access properties, JavaBeans conventions are used when naming these methods.

It is important to note that, in the preferred embodiments, traders provide vital feedback and oversight. Moreover, the embodiments evolve through use. There may be a lengthy tuning and feedback phase of algorithm development. The embodiments fit within a scalable architecture, and as the algorithms become more complex and widely used, the embodiments adapt and scale. Additionally, the embodiments must have fast Release Cycles. The preferred embodiments are flexible and separate the algorithm from the engine. Also, the algorithm should be as orthogonal as possible to the rest of the system. By use of this structure in the preferred embodiments, the embodiments can be used to trade and transact across virtually any instruments or exchanges.

In the preferred embodiments, the algorithms are tested for use. Of course, in other embodiments testing may not be desired. There are two main testing stages in a preferred embodiment.

The first stage involves soliciting feedback with the traders and salespeople using the algorithm. The algorithm will not work right the first time, situations will not have been thought of, parameters will be wrong, failsafes will not be good enough and so on.

The feedback at this early stage of development ensures not only a quick release but also that modifications can be made in situ.

The second stage of testing in this embodiment involves the continued evolution and updating of an algorithm once it is in production. It is important to have a very extensive series of tests that cover a multitude of trading situations. When changes are made to an algorithm, no matter how slight, every test is run and verified. This is necessary for production systems with a large number of users. Without high confidence that any changes made will not have any unforeseen follow-on effects, the release cycle becomes intolerably long. Of course, other embodiments may utilize different testing methods, including providing sample market feeds rather than real time feeds. The term "executing a trade" and its variants as used herein is meant to cover both actual and simulated execution of a trade.

The preferred embodiments implement a recovery mechanism, which assists the programmer in analyzing and/or recovering from crashes. The recovery process restores execution of orders by taking a number of steps. Those steps comprise:

- Recovering the state of the orders. This involves rebuilding the order hierarchy (parent/child relationships, executed quantities, etc.) as it existed prior to the crash.
- Recovering the exchange information. This involves making sure that all executions/corrections/cancellations that might have been pending when the embodiment crashed and had taken place during its blackout now get reflected in the embodiment's order hierarchy. This is done so that future algorithm decisions get based on the current state of the world, and not the one present before the crash.
- Restarting all algorithms. This is now possible since the algorithms will have their information up-to-date in order to make correct decisions on how to continue their execution. Depending on the complexity of the algorithms involved, this step may be as simple as setting up the event-action mappings for the algorithm context.

The recovery process in this embodiment includes writing to log or journal file. Of course other embodiments may have other recovery processes or recovery steps.

Figure 8 provides a flowchart summarizing processes of a preferred embodiment, from installation to trading. Figure 9 provides a flowchart summarizing a process for

changing a plug-in. Other embodiments may have these processes or other processes with the same or similar steps in these or other orders.

Figure 10 shows a schematic diagram of an especially preferred embodiment. The Core Processing Area 30 is, in this embodiment, the logic engine which processes the order. The Core Processing Area 30 is shown with various interfaces in the form of inputs and outputs. The especially preferred embodiments of the present invention accept input and output from a variety of sources. The sources may change according to the embodiment and in the especially preferred embodiments, the nature of the financial instrument traded (e.g. a particular stock, bond, etc.) helps determine the input and output sources. (It should be noted that input includes but is not limited to inputting data feeds as well as data blocks, such as for example retrieving messages from a message queue. Output includes but is not limited to outputting data feeds as well as data blocks, such as for example outputting messages to a message queue.)

The embodiment of Figure 10 is configured for trading stocks on the New York Exchange by way of Market Plug-In 31. Stock orders are entered into Ordering System 40 and/or Ordering System 41 (and any other ordering system that may be used) by a trader or another ("trader") using a Graphic User Interface ("GUI"). The GUI provides the trader with the option of selecting various algorithm plug ins to be used. The ordering system in turn interfaces with the logic engine, or in the embodiment of Figure 10, with the Core Processing Area 30.

An order may be one of two types. One type of order, SimpleOrder, uses simple actions, such as Limit orders (e.g., "Sell 15,000 shares of Microsoft at 35") or Market orders (e.g., "Buy 10,000 shares of Sun at Market".) SimpleOrders are, in this embodiment, not sent to the Core Processing Area 30. Rather, they are executed by some other mechanism, such as by the ordering system, e.g., by 40B or 41B of the Ordering Systems 40 or 41 in Figure 10.

A second type of order, ComplexOrders, uses higher level algorithms such as Volume Weighted Average Price; Ratio; Gamma Hedge; Aggressive Short Sell; Iceberg; Auto Trader; CB Delta Hedge; Stop Loss; and Short Sell. ComplexOrders usually comprise one or more Suborders. These Suborders can be either other ComplexOrders (which can have further suborders, possibly several levels deep) or SimpleOrders.

For example, assume a trader places a ComplexOrder using a Ratio algorithm:

BUY 10,000 SUNW and SELL 15,000 MSFT whenever the Ratio between the two exceeds 1.2

This order can be deconstructed into two separate Actions, buying 10,000 shares of Sun and selling 15,000 shares of Microsoft, whenever a certain Event happens (the price of Sun over Microsoft exceeds 1.2.) Therefore, this ComplexOrder can be processed by the Core Processing Area 30, into two SimpleOrders, each with an Action (e.g. buying 10,000 shares of Sun) linked to an Event (e.g., when the price of Sun over Microsoft exceeds 1.2.) The two SimpleOrders can then be returned to the Ordering System through an appropriate output driver as is seen in Figure 10 with regard to, for example, Output Driver 33 and Ordering System 40B.

As can be seen by the above example, higher level algorithms used by ComplexOrders can be comprised of Events and Actions. Once the ComplexOrders are processed to Events and Actions by the logic engine of the preferred embodiments, each Event and Action can be repackaged and executed as a SimpleOrder.

Returning now to Figure 10, Ordering System 40 and Ordering System 41 interface with Core Processing Area 30 through input drivers and output drivers as described below. As the orders are entered into Ordering System 40, they form a queue in section 40A of Ordering System 40. The orders are then retrieved from the queue by Input Driver 32. Similarly orders from Ordering System 41 are retrieved by Input Driver 34. It should be noted that input drivers are configured according to the input data configuration, and the information input may vary based upon the instrument traded, the user's desires, etc. (The word "driver" and its variants are used herein to mean any code or data interface.) Other embodiments may accept different inputs, through different input drivers. In these embodiments, the drivers may change as the instruments and/or the nature of the trade changes.

Some of the preferred embodiments are able, if they need to, to off-load any computationally intensive calculations, by using a distributed processing module, which proceeds by messaging amongst the components, such as messaging the results of calculations from a calculation component to the Core Processing Area. This off-loading allows more efficient attention to the ordering tasks. Distributed processing also permits for use of "dynamic" constants in executing a complex order. Dynamic constants as that term is used herein are numbers that are used in an algorithm as constants, but also may

change during the lifetime of the algorithm. For example, an off-line component may calculate certain alphas, used as constants, for an algorithm. These constants are then sent to the Core Processing Area to be used in future calculations of that particular algorithm. Thus, with a distributed processing system, the alphas may change, but the underlying algorithm remains the same.

Other inputs to the Core Processing Area 30 provide information necessary to execute the inputted orders by providing information on external conditions that may cause the Events and Actions of the order to be met. For example, in order to execute the Sun-Microsoft ComplexOrder example described above, the price ratio of Sun to Microsoft must be calculated by the Core Processing Area 30. In order to calculate the price ratio, the prices of Sun and Microsoft are provided to the Core Processing Area 30 by the data feed drivers.

In the embodiment of Figure 10, Data Feed 36 accepts information from “dynamic” data feeds (those real time feeds that typically change in fractions of a second), e.g. Reuters SSL, TIB/Rendezvous, etc. Data Feed 36 also accepts indirect input through intermediary interfaces. Figure 10, for example, shows a CORBA (Common Object Request Broker Architecture) interface into Data Feed Driver 36. The CORBA interface, in turn, collects various market data feeds.

Another input type is static or semi static information flows, e.g., a text file with instrument lot sizes, a database with closing prices, etc. In the embodiment of Figure 10, this input occurs by way of Instrument Information Driver 37. The instrument information driver provides a mechanism to update information from its sources if necessary. For example, a database with stock closing prices will be updated at the close of the trading session. In the preferred embodiments, updating may occur manually or automatically. Multiple drivers can also be set up to locate information about a particular instrument from different data feeds (e.g., stock pricing, options pricing for that stock, etc.)

It should be noted that the exemplary feeds described herein are used in the preferred embodiments described here, however, in other embodiments these and/or other data feeds with associated drivers, if necessary, may be used.

Also shown in Figure 10 are two Exchange Drivers 33 and 35 for Ordering Systems 40 and 41 respectively. These output drivers are responsible for sending any

orders created by the Core Processing Area 30 to the ordering systems for execution, as will be explained in further detail below.

A ComplexOrder is executed in the preferred embodiments by use of queues. An input driver retrieves a ComplexOrder object from an order queue. The ordering system will have identified the algorithm used by the ComplexOrder so that the Core Processing Area may wrap the order in a corresponding AlgorithmContext object instance. (The corresponding AlgorithmContext instance is based on the algorithm name specified by the order.)

The AlgorithmContext object will first register itself with specific event interests. Event interests are those relevant to the particular algorithm and the particular ComplexOrder. So, for example, if the order contains the event "The price of Sun over Microsoft exceeds 1.2" that specific AlgorithmContext object will register the order with an Event Interest object.

It should be noted that a complex ComplexOrder may be used, such as one that contains a multi-instrument order with multi-algorithms. In such an event, an AlgorithmContext Container object is created. This object wraps other AlgorithmContexts within it. The AlgorithmContext Container will then forward all order creation requests to its internal AlgorithmContexts. The instrument identification field for each algorithm provide the necessary identification for proper forwarding. In other embodiments, such as for example when a multi-instrument single algorithm is used, another field besides the instrument identification field may be used to identify the appropriate AlgorithmContext.

Event interests exist in this embodiment to provide a placeholder to an event. A placeholder is needed between the AlgorithmContext object and the event because the event may not exist at the time the order has been input. For example, the Sun-Microsoft price ratio event called for by the above example does not exist. Therefore, any direct call for the event by a AlgorithmContext object would be invalid. Accordingly, an Event Interest object is created instead, which will await the event.

Events may be generated internally, in the Core Processing Area, or be input by way of external sources, or both. So, for example, the Ratio event "The price of Sun over Microsoft exceeds 1.2" is generated internally, as a product of events from external sources. The external sources provide the price tick events, updated through "dynamic" data feeds, that allow the internal calculation and generation of the Ratio event. If the

Ratio event reaches the proper level, (“1.2” in the above example) the AlgorithmContext is notified.

Once the events are registered for the particular AlgorithmContext instance, the actions for any particular AlgorithmContext instance will be executed when the events occur. In order to execute the actions for a particular AlgorithmContext, an ActionDispatcher object is used. This object receives requests for dispatching actions when the event occurs and places the actions on an internal queue. So, for example, an ActionDispatcher object might receive an event, e.g. “The price of Sun over Microsoft exceeds 1.2” -- and place the corresponding action, e.g. “Buy 10,000 shares of Sun; sell 15,000 shares of Microsoft,” – on the internal queue.

Once the action is placed on the internal queue, those actions requiring orders, e.g. “Buy 10,000 shares of Sun; sell 15,000 shares of Microsoft to the ordering system,” send the orders to the ordering system by way of an ActionDispatcher. The order may be sent to any specific ordering system in the various preferred embodiments, and the specific ordering system that the order is sent to will depend upon the interface configuration.

After the ordering system executes the orders, it will send the execution confirmation to the Input driver. If, instead of execution, the order has been cancelled or corrected by the ordering system, the ordering system will send the appropriate message to the Input driver.

Isolating the execution of the actions by means of the ActionDispatcher helps prevent more than one action from the same ComplexOrder executing simultaneously, which is important to accurate execution. For example, if actions did execute simultaneously, there might be an out-of-order result fed back to the ComplexOrder, leading to incorrect execution of the order.

Once the order has been executed by the ordering system, an Order message is fed back to the Exchange driver. The Exchange driver will then create an ExchangeEvent object, which will be disseminated through the Core Processing Area. In an especially preferred embodiment, the ExchangeEvent object is sent to a market gateway component, which creates a SysAction object, to be used internally to update an associated AlgorithmContext object. Of course, it would be possible, in some embodiments, to update the AlgorithmContext object directly. However, the preferred embodiments use of

an indirect transfer for the order message helps ensure accuracy in the ordering mechanism by preventing interference with any possible action execution.

The SysAction object is used internally to update the AlgorithmContext object by way of the ActionDispatcher. The ActionDispatcher will also provide any other Event interests with the SysAction object, provided they had registered an interest with that particular AlgorithmContext. When the SysAction object informs the AlgorithmContext object the Actions have been completed (which may include notification of execution, failure to execute, etc.), the AlgorithmContext fires a CloseAction instance. In some preferred embodiments, this will close the order. In other embodiments, the CloseAction instance will trigger a message to the ordering system, which will close the order according to its mechanisms.

The preferred embodiments are not immune from system crashes and therefore the preferred embodiments attempt to ensure accuracy in order tracking and execution by isolating actions through queues and messaging. Moreover, objects, if tracked, can be recreated if the system crashes. SysAction objects, if created, are saved in a journal. If a crash occurs, and upon restarting, the Core Processing Area scans the journal, effectively as an input stream, reading in each SysAction object and providing whatever executions are necessary. This will have the effect of re-creating the order hierarchy as it was before the crash. Additionally, the preferred embodiments use an initialization recovery flag set by the AlgorithmContext object at the beginning of its instantiation. This recovery flag allows for the tracking of and thus re-creation of any registered event interests, as well as initialization and recovery of the order after a crash and subsequent system recovery.

The preferred embodiments also create an image file on a regular basis, perhaps at intervals as short as an hour or so. Every interval, the complete order state is dumped to two alternate mirror image files, which provides backup and possible replacement for the journal. The image files retain an order hierarchy and this hierarchy can be read post crash if necessary. The journal file will then provide the latest update.

The sophistication of the system makes constant testing necessary. Testing can occur through trader feedback, evolution and updating of an algorithm once it is in production. Simulated information feeds can also be used, in the preferred embodiments, to test the system.

Figure 11A shows an example of an preferred embodiment of the interface. The interface is comprised of three sub-interfaces. The sub-interfaces provide the user, administrator or another with the ability to give and receive information by: 1) creating, configuring, modifying and/or editing plug-ins (hereinafter “configure” and its variants); 2) tracking and/or monitoring orders; and, 3) monitoring the performance of an order server, by way of a first sub-interface, a second sub-interface and a third sub-interface respectively. Each of these sub-interfaces will be reviewed in further detail below.

Figure 11B shows an overview of the flow through a preferred embodiment. The top level interface is connected to a first sub interface which is an Order Tracker, a second sub interface which is a Plug In Configuration, and a third interface which is a Server Monitor. The first sub interface, Order Tracker, is in turn connected to a sub sub interface Order Details. The second sub interface, Plug In Configuration, is connected in turn to a sub sub interface which is offers alternatives to an Algorithm Editor interface, an Event Selector interface, an Action Selector interface and a Condition Selector interface. In turn each of these sub sub interfaces are connected to sub sub sub interfaces, which are a Event Editor interface, a Condition Editor interface and an Action Editor interface.

From the Interface of Figure 11B, a user may access three sub-interfaces. The Interface as well as the sub interfaces may be, in especially preferred embodiments, graphic user interfaces, and navigation to the sub interfaces is accomplished through various methods known in the art, e.g. tabs, menus, etc. It should be noted that in other embodiments, these interfaces, both top level and below, may be in various orders, other than those shown by the preferred embodiments. For example, an embodiment may only have a single interface. Another embodiment may only have an algorithm editor interface.

Returning now to the preferred embodiment shown in Figure 11B, various more detailed interfaces of the embodiment are shown at various other figures. For example, an Order Tracker interface is seen at Figure 12, an Order Details interface at Figure 13, an Algorithm Configuration interface at Figure 14, an Algorithm Editor interface at Figure 16, an Event Editor interface at Figure 18, an Action Editor interface at Figures 19 and 20, and a Server Monitor interface at Figure 21.

Turning now to the embodiment of Figure 12, an Order Tracker sub-interface embedded within an Interface screen is seen, which allows users to monitor orders. The sub-interface is implemented as a graphical user interface (GUI) in the especially preferred

embodiments and Figure 12 shows a screen shot of a GUI implementation. The Order Tracker tab is highlighted in Figure 12, which has provided the Order Tracker interface screen, within the Interface screen of this embodiment. As will be described in more detail below, the selection of the Order Tracker tab T1, the Algorithm Configuration tab T2, or the Server Monitor tab T3 from the Interface of this embodiment provides access to the various sub interfaces. In other embodiments, other interfaces and navigation and/or selection devices known in the art may be used, such as pull down menus, links, buttons, vertical tabs, etc. The available movement may be different in different embodiments as well, including navigation among interfaces other than those shown here, as well as variations on navigational tools.

The Order Tracker sub-interface may be connected to order servers 40 and 41, as shown in Figure 11A. This connection does not have to be direct in various embodiments, e.g., the connection may be through networks and through other computers.

The menu options of Figure 12 are shown generally at a. These include File, View, Server (providing a view over the desired Order server,) Look n' Feel (providing control over the colors etc. of the screen) and Help. The pull down options from these menus are as known in the art. Also shown at Figure 12, at b, are various icons. These allow for changes in the listing seen in the Order Section area 121. The New icon seen at area b, provides for the entry of test trades. The Expand All icon provides expansion of details on any particular order. The Collapse icon provides a collapsed view on the icons. The Order Details icon navigates to the details screen, as explained in further detail below. The Fire Event icon provides an override and immediate firing of an order. The Suspend icon allows for suspension of the order and the Resume icon allows for resumption of suspended orders. The Cancel icon will cancel orders.

The Order Section 121 of the interface of Figure 12 shows a listing of various order data, including order identification, the time and date the order was created, the tag which is an internal identifier for the trade originator, the algorithm including type used on the order, the side of the trade (e.g., buy or sell), the instrument of the order (e.g., stock, bond, etc.), the price, the quantity, the quantity or amount of the order that has been executed, the amount remaining to be executed, the percent completed, and a check box indicating if the order has been suspended. Details on orders, including Complex Orders,

can be displayed as well. For example, the order with ID 920 is a Complex Order comprised of two Simple Orders 10690 and 10710.

From the Order Tracker screen of Figure 12 a user can navigate to the Order Detail interface which is a GUI in this embodiment, and a typical screen shot of the GUI of the embodiment is seen at Figure 13. The Order Detail interface provides detail of a particular order as well as the history of orders. The user can select a particular order (e.g., by order ID) in Figure 12 to be displayed in the Order Detail interface by several methods. For example, a particular order can be selected by using a mouse, right clicking on the order, thus activating a pull down menu, and selecting an navigation option from that menu. Alternatively, a user can click on an order, thus highlighting the order and then select an option for the Order Detail screen from a View pull down menu.

The Order Detail screen has three sections: a) Current State section 131, b) Past Activity section 132) and c) Future Activity section 133. The Current State section 131 shows the current state of the order properties. The Past Activity Section 132 shows the past events that have occurred on the order. The Future Activity section 133 shows the events that will occur in the future with an optional time component.

It should be noted that the Order Tracker and Order Detail sub interfaces of Figures 12 and 13 may be of different configurations, and have other components, in other embodiments. Additionally, one or more of these interfaces may not be present in other embodiments.

Turning now to Figure 14, the Algorithm Configuration sub-interface that results from selecting the Algorithm Configuration tab T2 of the Interface of this embodiment is seen. The sub-interface comprises a GUI in this embodiment, and a typical screen shot is shown in the Figure. The Algorithm Configuration screen allows the user to create, delete and/or configure a preexisting plug in, shown here as a drop down window 143 labeled algorithm context. Buttons 141 and 142 allow new plug ins to be added or deleted. Any particular plug in component may be enabled as desired, by checking the appropriate box in the enabled column. Also priorities may be assigned the component in execution, so that, for example, any particular component may be run in an order besides the usual order by establishing a different priority for that component.

Editing assistance is provided in this embodiment through Editing screen 145. The plug in being edited is displayed, along with any components, such as the Event-Action

pairings and Conditions, if the latter exist, shown in the Figure for the particular VWAP plug in shown. The components may be edited and deleted from the plug in, and new components may be added or inserted as desired. The buttons 146, 147, 148, and 149 enable the add, insert, edit and delete functions as shown on Figure 14. Figure 15 shows another method of adding, inserting, editing or deleting the various component plug ins, by use of a pop up menu 151, accessed by right clicking on the particular component. It should be noted that the sub interfaces of Figures 14 and 15 may be of different configurations, and have other components, in other embodiments. Additionally, one or more of these interfaces may not be present in other embodiments.

If the edit function is selected, an Algorithm Editor interface, or GUI, is presented. A typical screen shot of an Algorithm Editor interface is shown at Figure 16. The screen shot of Figure 16 shows an Algorithm Editor screen for an event-action pair in the TVVWAP algorithm context. The Algorithm Editor screen is comprised of various fields in this embodiment: 1) an Event field 161, which is comprised of a Description field, a Property field, and an Expression field; 2) A Condition field 162; 3) An Action field 163; and 4) A Priority field section 164. Additionally an Enabled box 165 allows the checkoff of an Enabled variable. The sample Event shown in Figure 16 is the OneTimeTimer Event, and has, as a default, the various descriptions and other components as shown in the Figure. Each of these may be edited or otherwise modified by the user as desired.

The choice of which preselected Event may be edited may be through a drop down box 171, as shown in Figure 17, which provides the user with other possible Events to edit. Upon selection of any of these, the various fields will be filled with the appropriate components, which then be modified as desired. One method of modification used in the especially preferred embodiments is seen at Figure 18, which shows a drop down menu 181 appearing when a user selects an action displayed in the action section 182 and right clicks on the action. Of course, other embodiments may use other editing methods as known in the art, including pop up word processing editors, database field editors, etc.

As shown by Figures 16-18, the Algorithm editor of the preferred embodiments provides the user with the ability to configure the Action Bindings, as Action Bindings are used in the Algorithm type of plug in. Other embodiment may use a different editor or editors for algorithms, or may use a different editor or editors for different plug ins. It should also be noted that the sub interfaces of Figures 14-18 may be of different

configurations, and have other components, in other embodiments. Additionally, one or more of these interfaces may not be present in other embodiments.

Actions may also be edited, if they are a component of the plug in, such as when an algorithm plug in is being configured. Figure 19 shows a typical screen shot of an Action Editor interface of a preferred embodiment. A drop down menu 191 permits accessing preexisting Actions. In the typical screen shown at Figure 19, the Action "placemarketonCloseOrder" action has been selected. As seen in Figure 20, certain default components for the selected Action will then appear, once the Action is selected. In the embodiment of the Figure, these are Description, Property and Expression components. Each of these can then be edited, if desired, using a right click drop down menu or other editing methods known in the art. It should also be noted that the sub interfaces of Figures 19-20 may be of different configurations, and have other components, in other embodiments. Additionally, one or more of these interfaces may not be present in other embodiments.

A third sub-interface is shown in Figure 21. This sub-interface is for a Server Monitor sub-interface as shown in Figure 11A and Figure 11B. This third sub-interface enables a user to monitor the logic engine server used to process trading orders. In the embodiment of Figure 21, the monitored fields are Property and Expression, although of course in other embodiments other data may be monitored or the sub-interface dispensed with entirely. The Server Monitor, in the embodiment of Figure 21, also has an Update button in order to refresh and update the information. It should also be noted that the sub interface of Figures 21 may be of different configurations, and have other components, in other embodiments.

The preferred interface and associated software for trading is provided in a GUI using windows and is constructed in Java, using Swing. However, any environment known in the art may be used and it should be specifically understood that embodiments can be implemented in environments that support GUI and other interfaces, including but not limited to Microsoft Windows 2000®, Windows 95®, 98®, ME®, Unix® and Unix -- like platforms, including but not limited to Linux® and its variants as well as other operating system platforms included but not limited to IBM OS/390®, MacOS®, VxWorks®, etc. Additionally embodiments may be construction in languages known in the art such as C++.

The above description and the views and material depicted by the figures are for purposes of illustration only and are not intended to be, and should not be construed as, limitations on the invention.

Moreover, certain modifications or alternatives may suggest themselves to those skilled in the art upon reading of this specification, all of which are intended to be within the spirit and scope of the present invention as defined in the attached claims.

CLAIMS

We claim:

1. An apparatus for a computerized trading system comprising:
 - a logic engine comprising a first plug-in for implementing a trading strategy;
 - an interface comprised of a first sub-interface, whereby said first sub-interface configures said first plug-in used in said logic engine for processing trading orders.
2. The apparatus of claim 1 wherein said first plug-in is comprised of an algorithm, and whereby said first sub-interface configures said algorithm.
3. The apparatus of claim 1 wherein said first plug-in is comprised of an algorithm, wherein said algorithm is further comprised of an algorithm context; and said first sub-interface configures said algorithm context.
4. The apparatus of claim 1 wherein said first plug-in is comprised of an algorithm, wherein said algorithm is further comprised of an event-action pair that is processed by said logic engine, and said first sub-interface permits the selection and configuration of said algorithm.
5. The apparatus of claim 1 wherein said interface comprises a graphical user interface.
6. The apparatus of claim 1 wherein said first sub-interface comprises a graphical user interface.
7. The apparatus of claim 6 wherein said graphical user interface comprises an Order Tracker.
8. The apparatus of claim 6 wherein said graphical user interface comprises an Algorithm Configuration.

9. The apparatus of claim 6 wherein said graphical user interface comprises an Server Monitor.
10. The apparatus of claim 1 wherein said interface further comprises a second sub-interface.
10. The apparatus of claim 10 wherein said interface further comprises a third sub-interface.
11. A method for computerized trading comprising:
 - providing a logic engine with a first plug-in for implementing a trading strategy;
 - configuring said plug in using an interface comprised of a first sub-interface, and
 - processing a trade using said logic engine with said first plug-in.
12. A method as in claim 11 wherein said first plug-in is comprised of an algorithm, and whereby said configuration step further comprises configuring said algorithm using an algorithm configuration interface.
13. An interface used in a computerized trading system comprising at least one sub interface for configuring a plug in used in said computerized trading system.
14. An interface as in claim 13 wherein said plug in comprises an algorithm plug in.
15. An interface as in claim 14 wherein said interface comprises a graphical user interface.

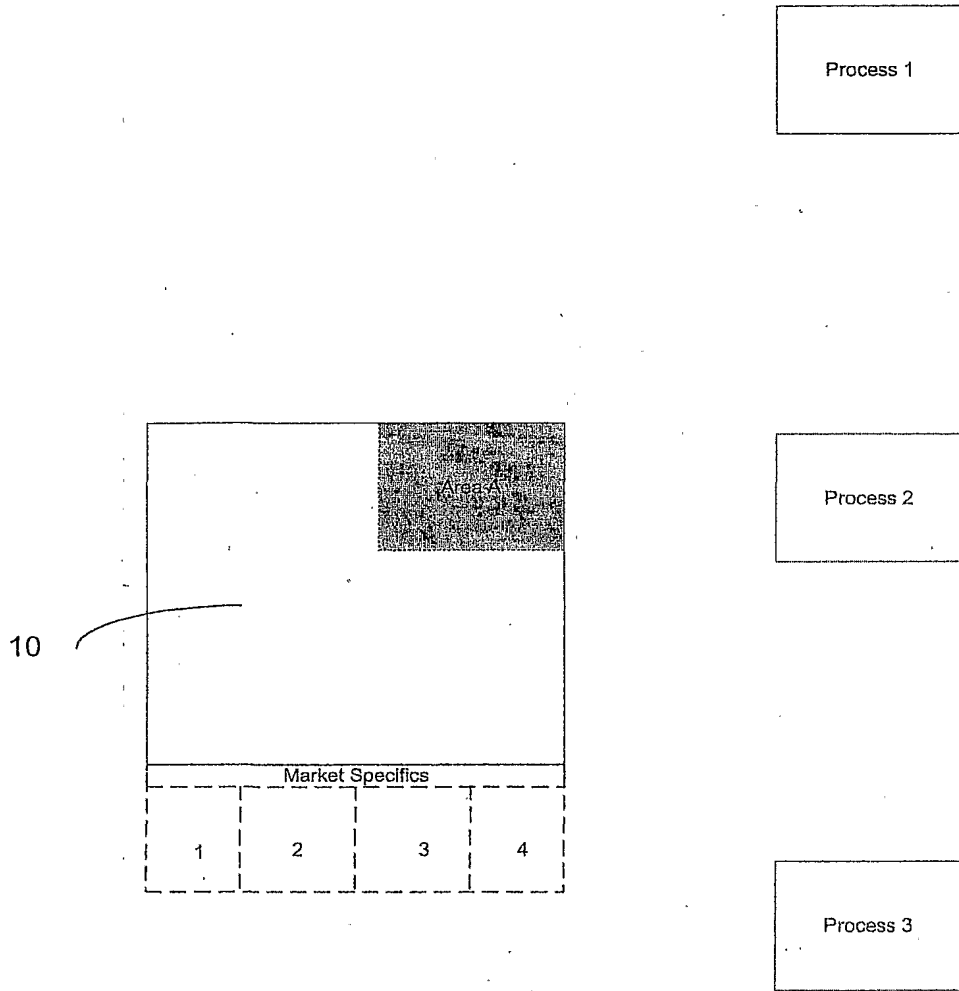


Figure 1

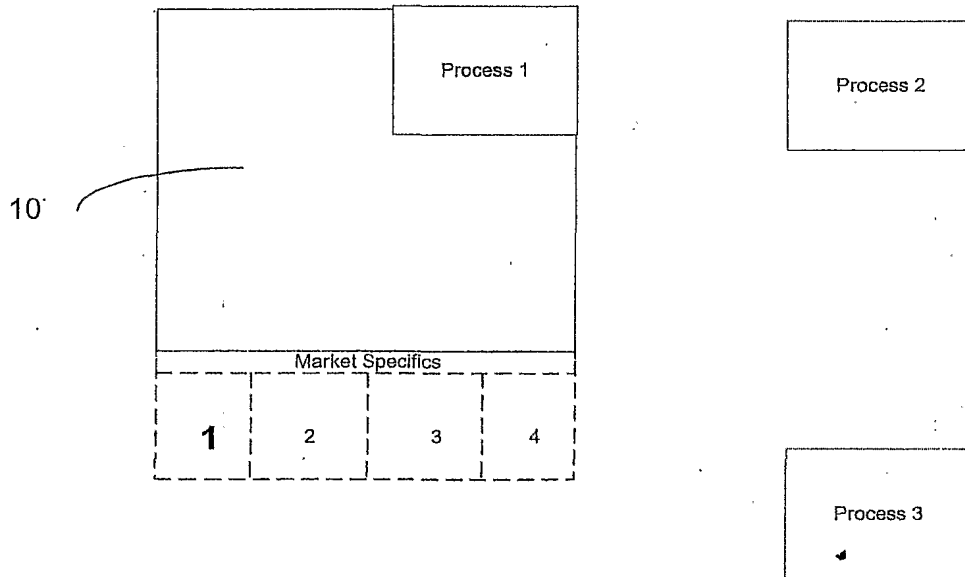


Figure 2

Administration Tool

File View Server Look'n'Feel Help

Order Tracker Algorithm Configuration Server Monitor

New Expand all Collapse ... Details Fire event Suspend Resume Cancel

all

id	Created	Tag	Algorithm/Type	Side	Instrum...	Price	Quantity	Executed	To execute	% Com...	Susp.
cipher-462											
360	08:57:56		TVWVAP	Buy	AXP		200000.0	63351.0	136649.0	31.68	<input type="checkbox"/>
10680	10:51:56	MarketMaking-66	Limit	Buy	AXP	50.3126	2823.0	623.0	2300.0	18.63	<input type="checkbox"/>
420	09:07:30		TVWVAP	Buy	BUD		88470.0	21838.0	66632.0	24.88	<input type="checkbox"/>
10840	10:51:40	MarketMaking-48	Limit	Buy	BUD	78.875	1187.0	0.0	1187.0	0.0	<input type="checkbox"/>
440	09:08:38		TVWVAP	Buy	MO		247240.0	68292.0	178948.0	27.62	<input type="checkbox"/>
10460	10:49:12	MarketMaking-40	Limit	Buy	MO	28.1875	2999.0	0.0	2999.0	0.0	<input type="checkbox"/>
460	09:09:30		TVWVAP	Buy	UNH		45340.0	10777.0	34563.0	23.77	<input type="checkbox"/>
10660	10:51:50	MarketMaking-57	Limit	Buy	UNH	77.125	360.0	160.0	200.0	44.44	<input type="checkbox"/>
480											
700	09:19:09		TVWVAP	Sell	C		230130.0	72781.0	157349.0	31.63	<input type="checkbox"/>
10520	10:50:00	MarketMaking-68	Limit	Sell	C	60.5	3281.0	0.0	3281.0	0.0	<input type="checkbox"/>
720	09:19:55		TVWVAP	Sell	C		230100.0	74454.0	155646.0	32.36	<input type="checkbox"/>
10530	10:50:00	MarketMaking-69	Limit	Sell	C	60.5	3281.0	0.0	3281.0	0.0	<input type="checkbox"/>
850	09:22:16		TVWVAP	Buy	XOM		13600.0	3715.0	9885.0	27.32	<input type="checkbox"/>
950	09:23:54		TVWVAP	Buy	NOK		188200.0	62228.0	125972.0	33.06	<input type="checkbox"/>
920	09:23:58		TVWVAP	Buy	HON		180100.0	48113.0	131987.0	26.71	<input type="checkbox"/>
10690	10:51:56	MarketMaking-56	Limit	Buy	HON	53.375	1050.0	0.0	1050.0	0.0	<input type="checkbox"/>
10710	10:52:29	MarketMaking-57	Limit	Buy	HON	53.4375	690.0	0.0	690.0	0.0	<input type="checkbox"/>

Figure 3

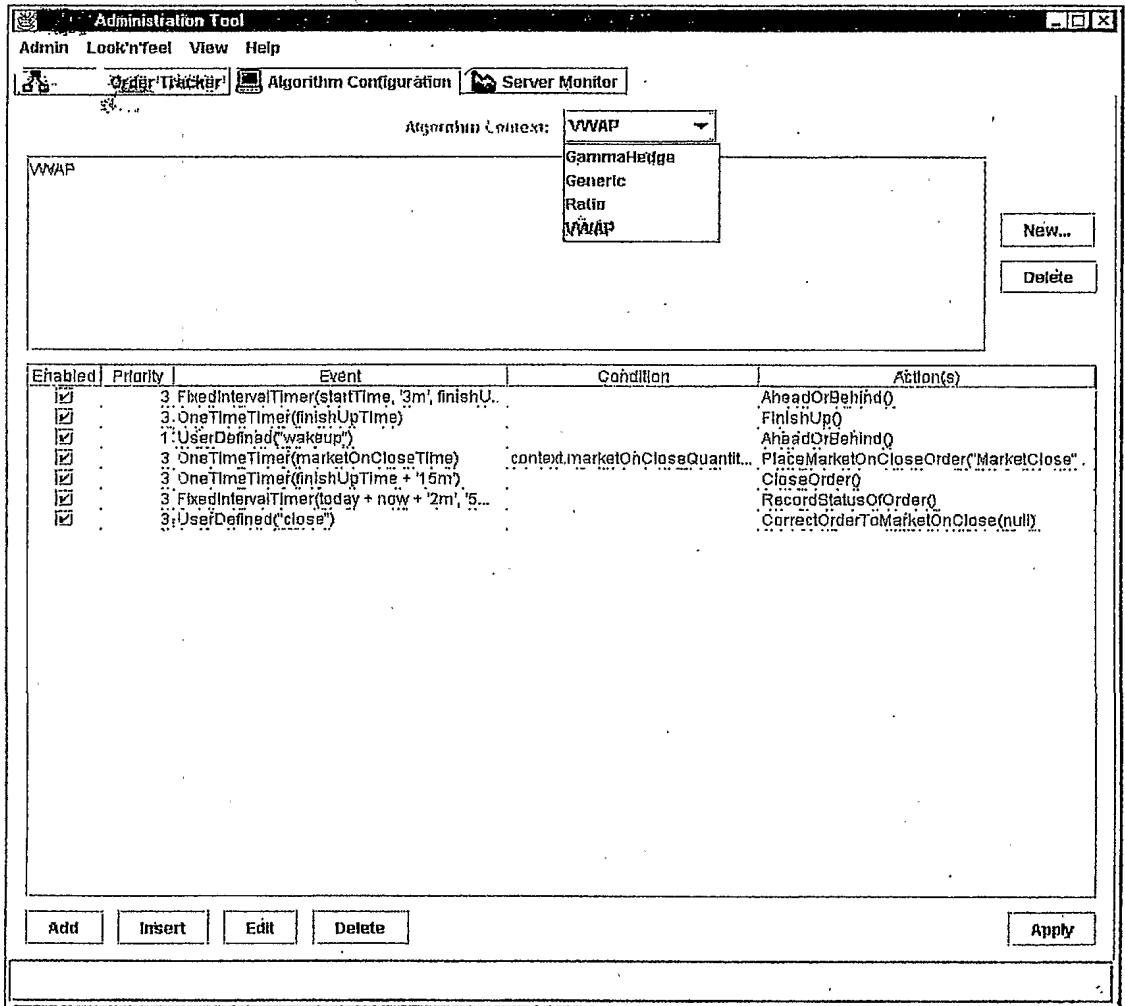


Figure 4

Buy 150,000 PEP (VWAP Order cipher-6455667) Details

Current state

Property	Expression
currentAP5	35.8833
targetQuantityMax	33848.0
targetQuantityMin	25152.0
currentMarketVWAP	35.8833
targetQuantity	29500.0
targetExtantQuantity	32400.0

Past activity

Time	Id	Algorithm/Type	Su...	Event	Action
12:56:14	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(0)	AheadOrBehind
12:58:14	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(0)	RecordStatusOfOrder
12:59:16	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(1)	AheadOrBehind
13:02:18	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(2)	AheadOrBehind
13:03:16	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(1)	RecordStatusOfOrder
13:05:21	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(3)	AheadOrBehind
13:08:18	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(2)	RecordStatusOfOrder
13:08:23	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(4)	AheadOrBehind

Future activity

Time	Id	Algorithm/Type	Su...	Event	Action
13:47:52	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(17 (18/60))	AheadOrBehind
13:48:34	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(10 (11/38))	RecordStatusOfOrder
13:50:54	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(18 (19/60))	AheadOrBehind
13:53:38	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(11 (12/38))	RecordStatusOfOrder
13:53:56	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(19 (20/60))	AheadOrBehind
13:56:59	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(20 (21/60))	AheadOrBehind
13:58:38	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(12 (13/39))	RecordStatusOfOrder
14:00:01	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(21 (22/60))	AheadOrBehind

Refresh Ok

Figure 5

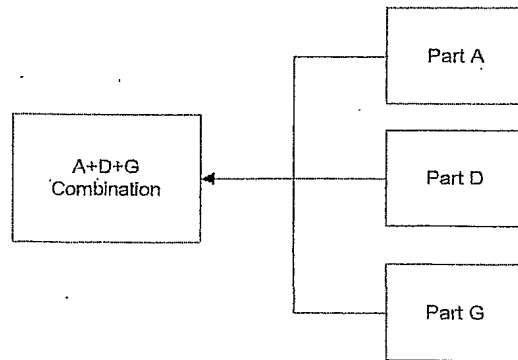
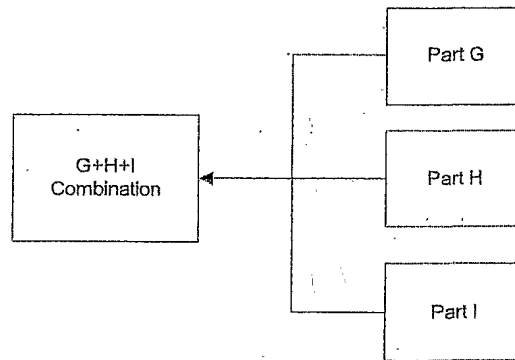
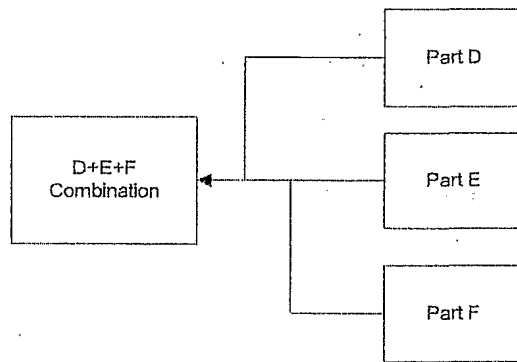
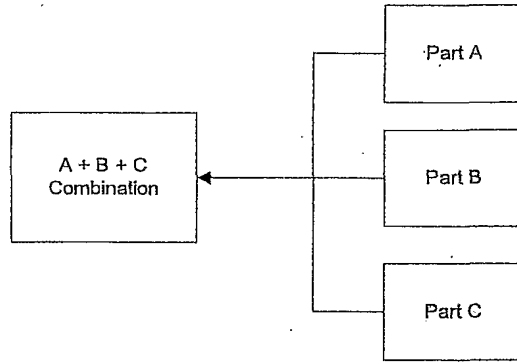
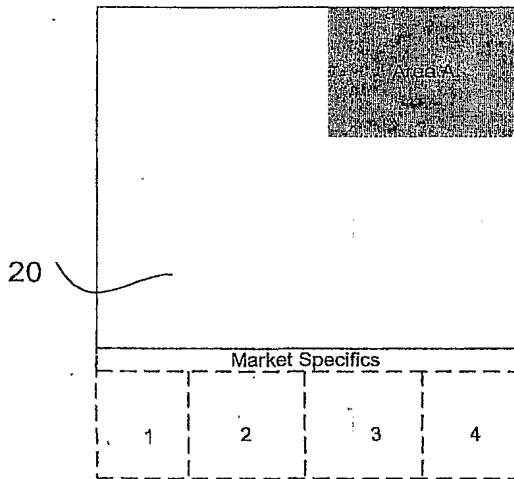


Figure 6

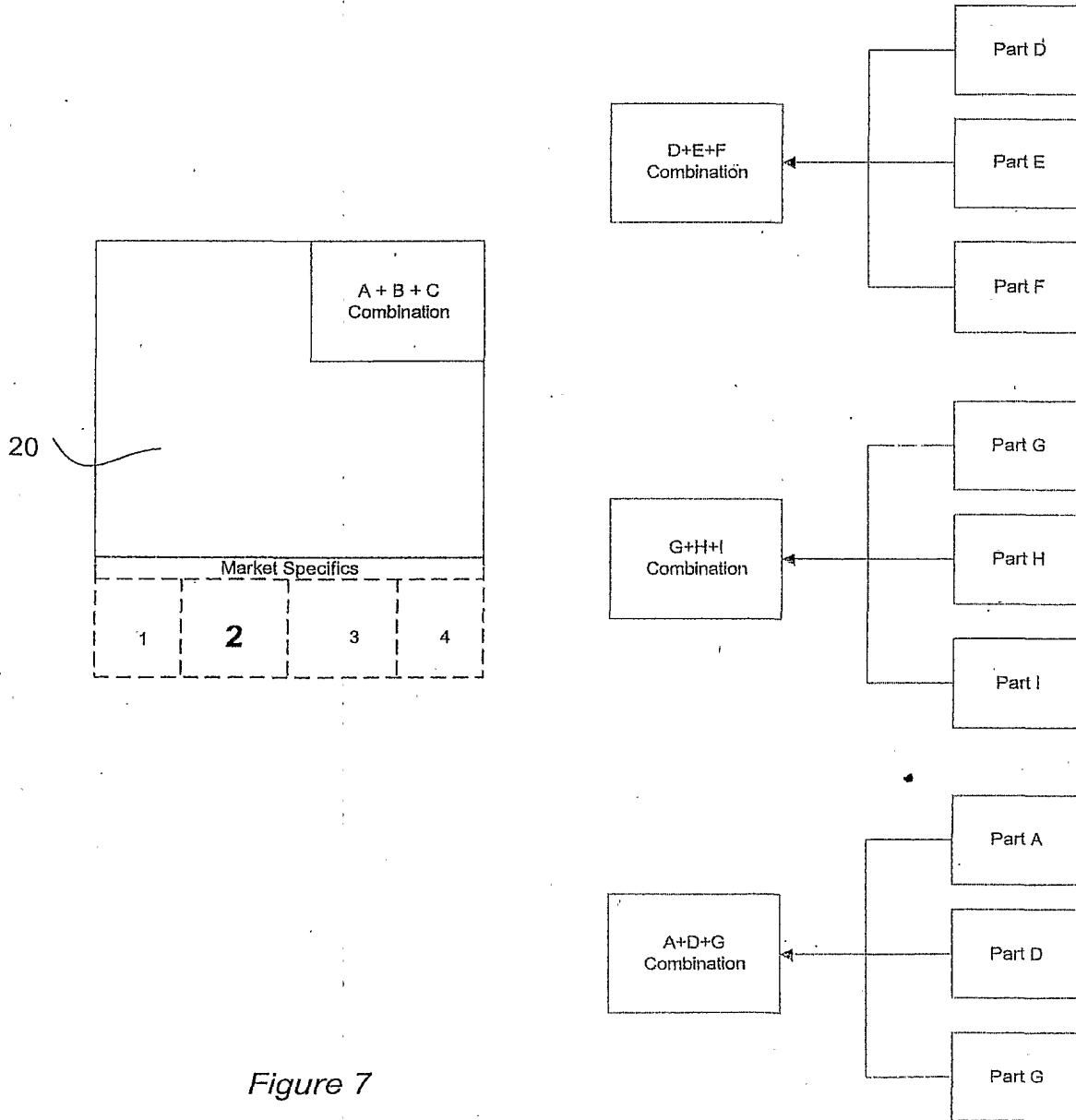


Figure 7

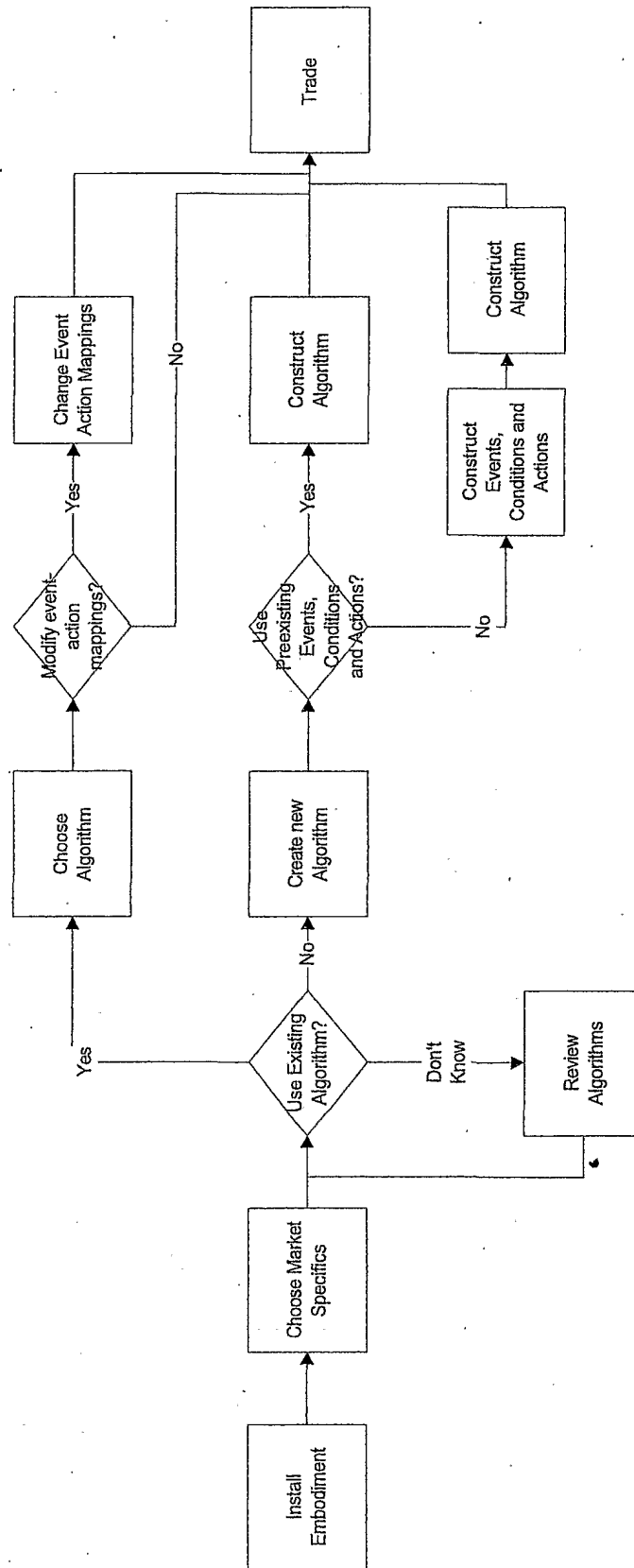


Figure 8

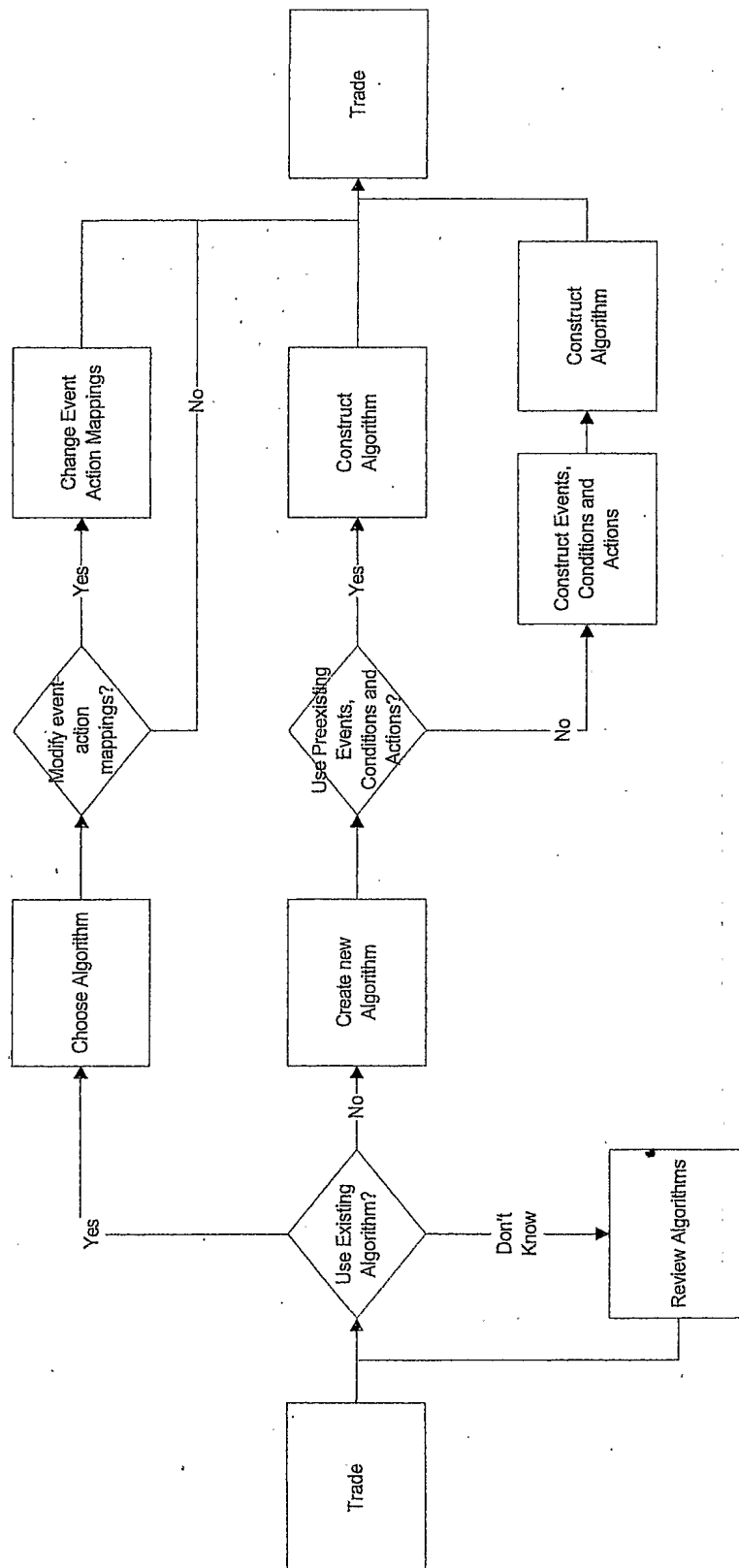


Figure 9

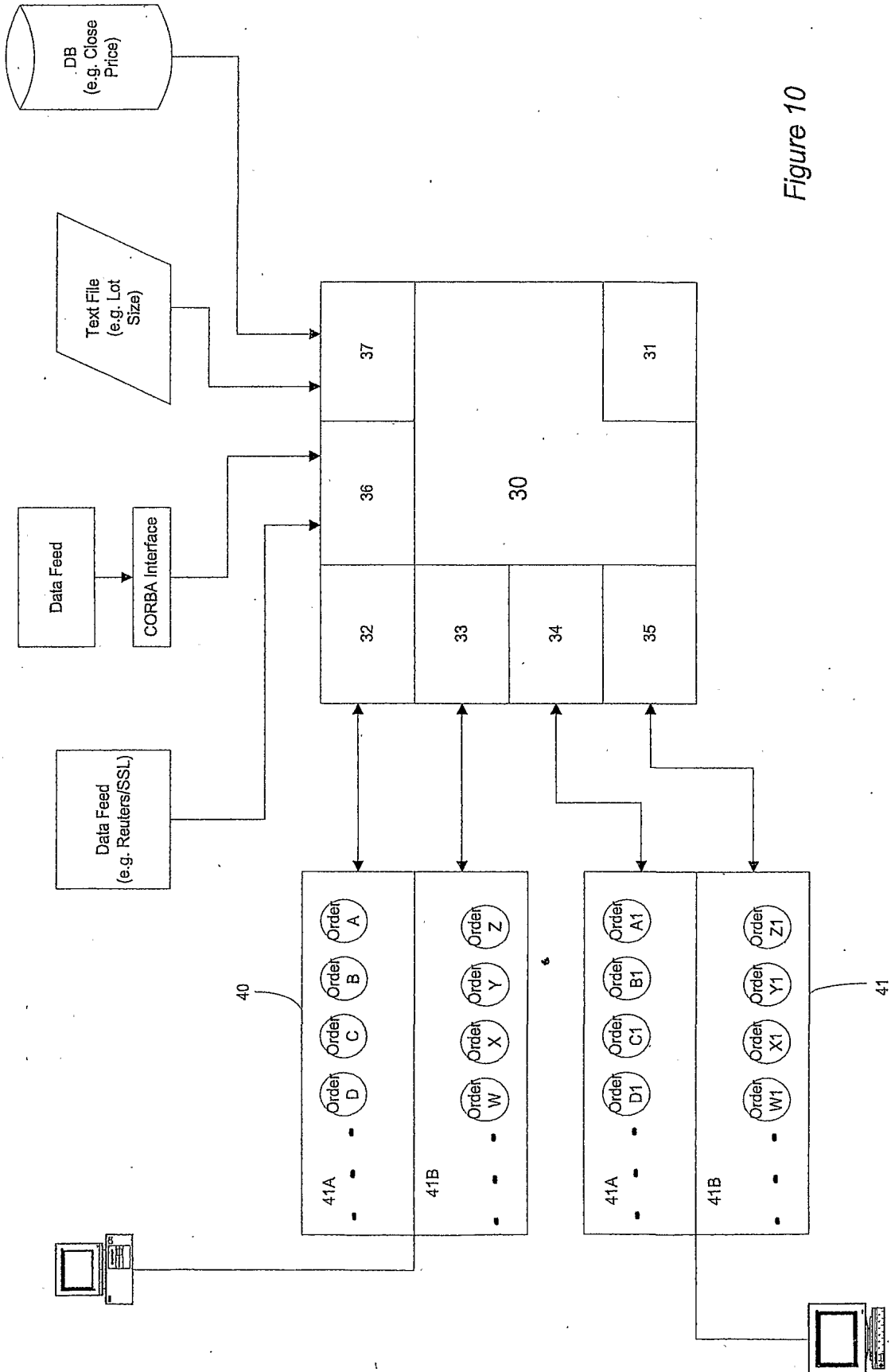


Figure 10

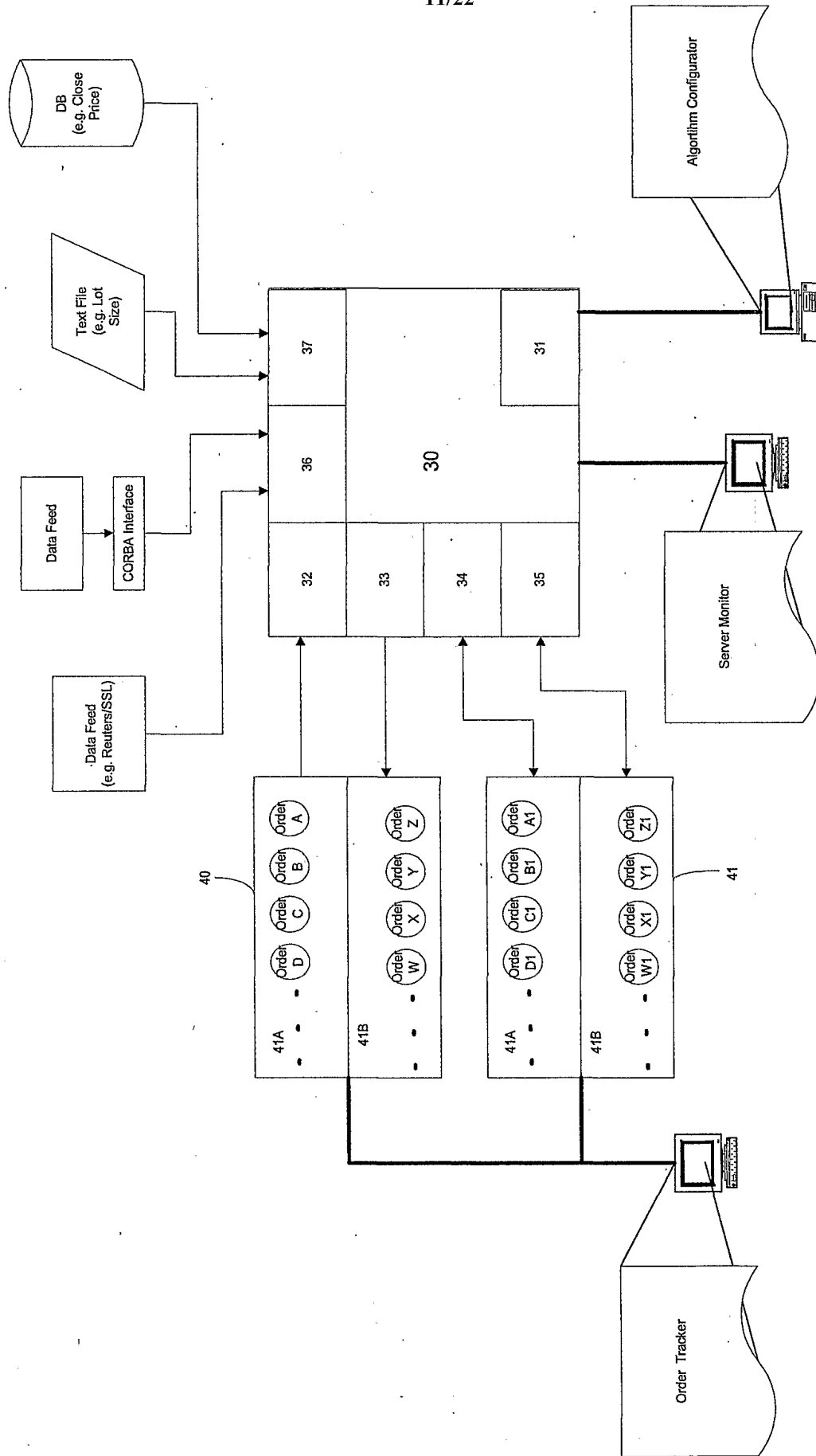


Figure 11A

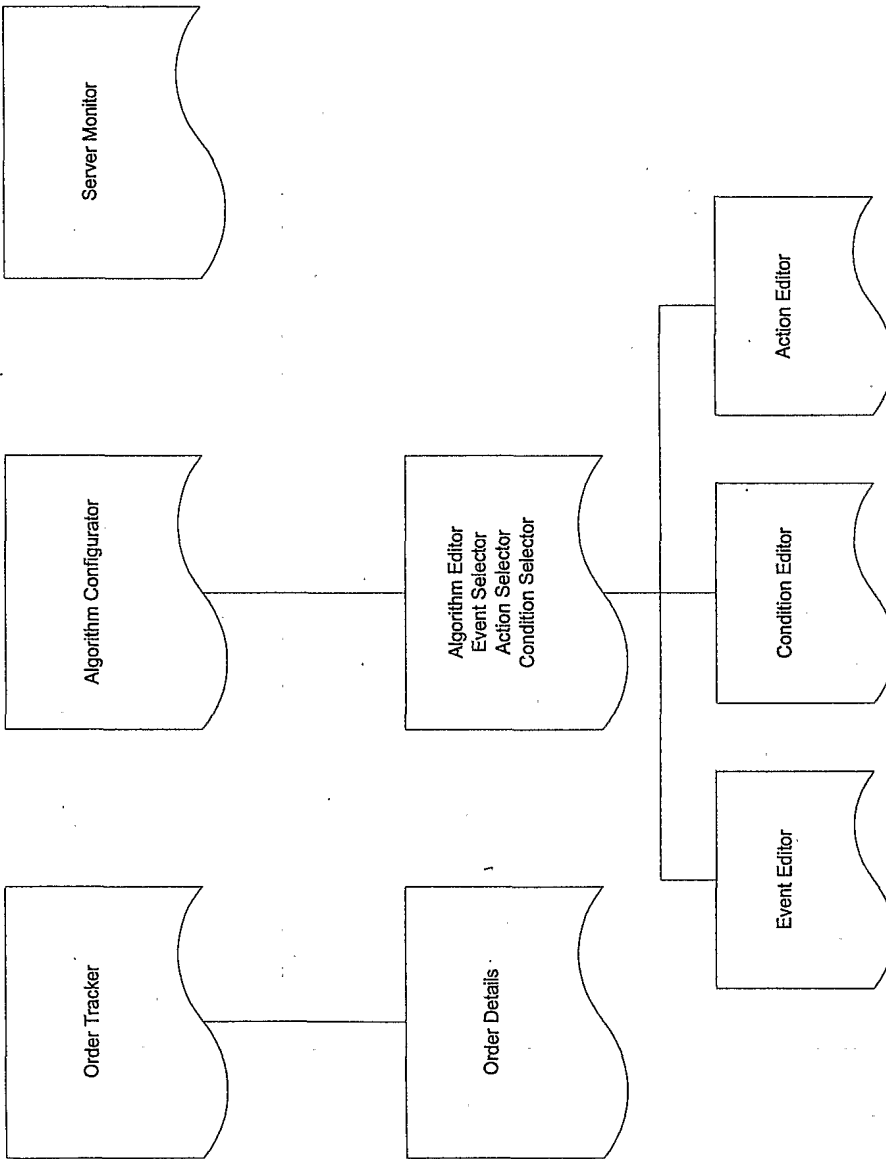


Figure 11B

T1

T2

T3

a

b

Administration Tool

File View Server Look'n'feel Help

Order Tracker Algorithm Configuration Server Monitor

New Expand all Collapse ... Details Fire event Suspend Resume Cancel

Id	Created	Tag	Algorithm/Type	Side	Instrum...	Price	Quantity	Executed	To execute	% Com...	Susp.
360	08:57:56		TVWAP	Buy	AXP		200000.0	63351.0	136649.0	31.68	<input type="checkbox"/>
10680	10:51:56	MarketMaking-86	Limit	Buy	AXP	50.3125	2823.0	523.0	2300.0	18.53	<input type="checkbox"/>
420	08:07:30		TVWAP	Buy	BUD		88470.0	21838.0	66632.0	24.68	<input type="checkbox"/>
10640	10:51:40	MarketMaking-48	Limit	Buy	BUD	78.875	1187.0	0.0	1187.0	0.0	<input type="checkbox"/>
440	09:08:38		TVWAP	Buy	MO		247240.0	68292.0	178948.0	27.62	<input type="checkbox"/>
10460	10:49:12	MarketMaking-40	Limit	Buy	MO	28.1875	2898.0	0.0	2898.0	0.0	<input type="checkbox"/>
460	09:09:30		TVWAP	Buy	UNH		45340.0	10777.0	34563.0	23.77	<input type="checkbox"/>
10660	10:51:50	MarketMaking-57	Limit	Buy	UNH	77.125	360.0	160.0	200.0	44.44	<input type="checkbox"/>
490											<input type="checkbox"/>
700	09:19:09		TVWAP	Sell	C		230130.0	72781.0	157349.0	31.63	<input type="checkbox"/>
10520	10:50:00	MarketMaking-68	Limit	Sell	C	60.5	3281.0	0.0	3281.0	0.0	<input type="checkbox"/>
720	09:19:55		TVWAP	Sell	C		230100.0	74454.0	155646.0	32.36	<input type="checkbox"/>
10530	10:50:00	MarketMaking-69	Limit	Sell	C	60.5	3281.0	0.0	3281.0	0.0	<input type="checkbox"/>
850	09:22:18		TVWAP	Buy	XOM		13600.0	3715.0	9885.0	27.32	<input type="checkbox"/>
850	09:23:54		TVWAP	Buy	NOK		188200.0	62228.0	125972.0	33.06	<input type="checkbox"/>
820	09:23:58		TVWAP	Buy	HON		180100.0	48113.0	131987.0	26.71	<input type="checkbox"/>
10690	10:51:58	MarketMaking-56	Limit	Buy	HON	53.375	1050.0	0.0	1050.0	0.0	<input type="checkbox"/>
10710	10:52:29	MarketMaking-57	Limit	Buy	HON	53.4375	690.0	0.0	690.0	0.0	<input type="checkbox"/>

121

Figure 12

Buy 150,000 PEP (VWAP Order cipher-6456671) Details

Current state

Property	Expression
currentAPS	35.8833
targetQuantityMax	33848.0
targetQuantityMin	25152.0
currentMarketVWAP	35.8833
targetQuantity	29600.0
targetExtantQuantity	32400.0

Past activity

Time	Id	Algorithm/Type	Su...	Event	Action
12:56:14	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(0)	AheadOrBehind
12:58:14	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(0)	RecordStatusOfOrder
12:59:16	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(1)	AheadOrBehind
13:02:18	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(2)	AheadOrBehind
13:03:16	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(1)	RecordStatusOfOrder
13:05:21	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(3)	AheadOrBehind
13:08:18	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(2)	RecordStatusOfOrder
13:08:23	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(4)	AheadOrBehind

Future activity

Time	Id	Algorithm/Type	Su...	Event	Action
13:47:52	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(17 (18/60))	AheadOrBehind
13:48:34	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(10 (11/39))	RecordStatusOfOrder
13:50:54	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(18 (19/60))	AheadOrBehind
13:53:36	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(11 (12/39))	RecordStatusOfOrder
13:53:56	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(19 (20/60))	AheadOrBehind
13:56:59	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(20 (21/60))	AheadOrBehind
13:58:38	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(12 (13/39))	RecordStatusOfOrder
14:00:01	cipher-6455...	VWAP	<input type="checkbox"/>	RepetitiveTimer(21 (22/60))	AheadOrBehind

Refresh Ok

Figure 13

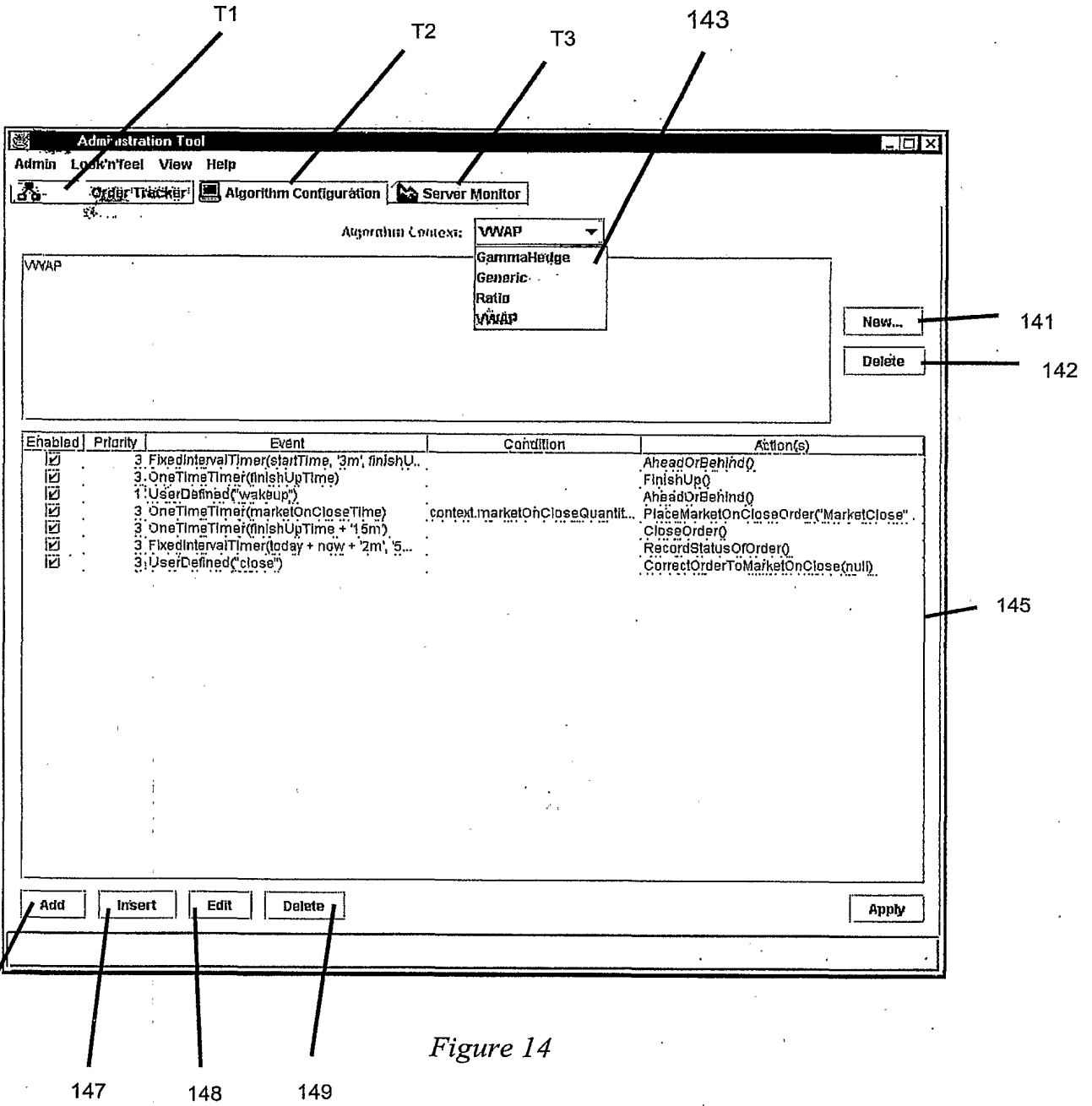


Figure 14

File View Server Look'n'Feel Help

Clipboard Order Tracker Algorithm Configuration Server Monitor

Algorithm Context: TWVWAP

New... Delete

Enabled	Priority	Event	Condition	Action(s)
<input checked="" type="checkbox"/>		3 FixedIntervalTimer(30s; finishUp...		AheadOfBehind()
<input checked="" type="checkbox"/>		3 OneTimeTimer(finishUpTime)		FinishUp()
<input checked="" type="checkbox"/>		3 UserDefined(cancel)		CancelSubOrders()
<input checked="" type="checkbox"/>		3 UserDefined(correct)		CorrectOrderPrice("...", context.mai...
<input checked="" type="checkbox"/>		3 UserDefined(contract)		CorrectOrderQuantity("000", "...")
<input checked="" type="checkbox"/>		3 UserDefined(contract)		CorrectOrderMarket("MM")
<input checked="" type="checkbox"/>		3 UserDefined(limit)		PlaceLimitOrder(context.mainInsr...
<input checked="" type="checkbox"/>		3 UserDefined(wakeup)		AheadOfBehind()
<input checked="" type="checkbox"/>		3 OneTimeTimer(ma	... context.marketOnClassQuant...	PlaceMarketOrderClassOrder(conte...
<input checked="" type="checkbox"/>		3 OneTimeTimer(fin	CloseOrder()
<input checked="" type="checkbox"/>		3 FixedIntervalTimer		RecordStatusOrder()
<input checked="" type="checkbox"/>		3 UserDefined(clos		FinishUp()
<input checked="" type="checkbox"/>		3 UserDefined(sum		RecordOrderSummary()
<input checked="" type="checkbox"/>		3 Tick(mainInstrum		RecordOrderNumber <= 0 ... AheadOfBehind()
<input checked="" type="checkbox"/>		2 Execution("...")	context.readomNumber <= 0 ...	AheadOfBehind()
<input checked="" type="checkbox"/>		3 UserDefined(market)		PlaceMarketOrder(context.maiInh...
<input checked="" type="checkbox"/>		3 UserDefined(sell)		PlaceMarketOrder(context.maiInh...
<input checked="" type="checkbox"/>		3 UserDefined(accept)		ThrowException()

Add Insert Edit Delete

151

Figure 15

The image shows a dialog box titled "Action Binding" with a close button (X) in the top right corner. The dialog is divided into several sections:

- Priority:** A dropdown menu showing "3 (Default)".
- Enabled:** A checked checkbox.
- Event:** A dropdown menu showing "One Time Timer". Below it is a text area containing the text: "A one-time timer that will go off at time."
- Expression:** A table with two columns: "Property" and "Expression". The "Property" column contains the text "fire" and the "Expression" column contains the text "MarketOnCloseTime".
- Condition:** A text field containing the expression: "context.MarketOnCloseQuantity > 0".
- Actions:** A text field containing the code: "FaceMarketOnCloseOrder(context.mainInstrumentId, 'MarketClose', context.MarketOnCloseQuantity);".
- Buttons:** "Ok" and "Cancel" buttons at the bottom right.

Reference numbers 161, 162, and 163 are placed to the right of the dialog box, pointing to the Expression table, the Condition field, and the Actions field respectively. Reference number 164 is placed to the right of the Priority dropdown.

Figure 16

Action Binding [X]

Enabled Priority 3 (Default) ▾

Event

OneTimeTimer ▾

A one-time timer that will go off at time.

Property	Expression
tr marketOnCloseTime	

time

Condition: context.tr marketOnCloseQuantity > 0

Actions

PlaceMarketOrder(context.mainInstrumentId, MarketClose, context.marketOnCloseQuantity.)

Context Menu: Add, Insert, Edit, Delete

Ok Cancel

181

182

Figure 18

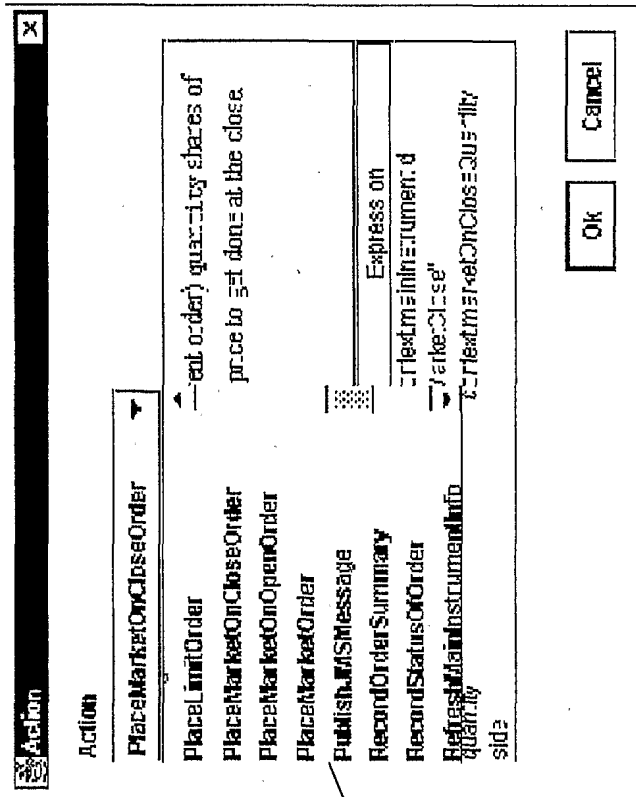


Figure 19

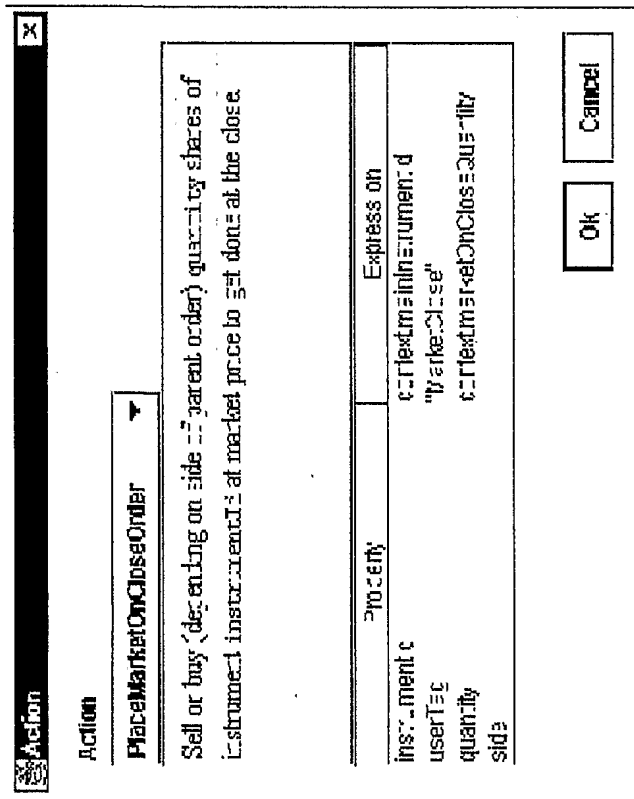


Figure 20

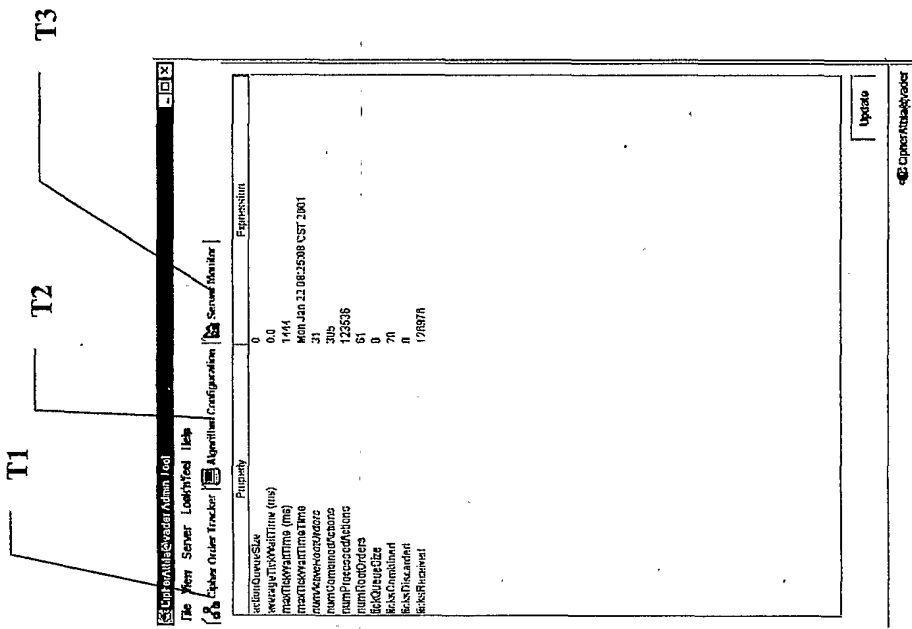


Figure 21

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/31378

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 17/60
 US CL : 705/37

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/37, 35, 36; 340/825.26, 825.27; 707/104.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 USPAT, JPO, EPO, Derwents WPI, IBM TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,119,104 A (BRUMBELOW et al.) 12 September 2000 (12.09.2000), see abstract and column 4, line 61 - column 5, line 5.	1-15
Y	US 6,026,440 A (SHRADER et al.) 15 February 2000 (15.02.2000), see abstract and entire document.	1-15
A	US 5,434,395 A (STORCK et al.) 18 July 1995 (18.07.1995), see abstract.	1-15

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

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Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer Vincent Millin <i>Peggy Harrod</i> Telephone No. 703 305-3900

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WO 02/33623 A1

(54) Title: APPARATUS, METHODS AND ARTICLES OF MANUFACTURE FOR EXECUTING COMPUTERIZED TRANSACTION PROCESSES

(57) Abstract: Apparatus, methods and articles of manufacture for construction and execution of computerized transaction processes comprising one or more Order Management Systems in a distributed computing environment. The various embodiment construct the Order Management System from of cooperating service components, an in memory cache, and a client API. Use of a toolkit of these components provides an ability to customize an Order Management System.

**APPARATUS, METHODS AND ARTICLES OF MANUFACTURE
FOR EXECUTING COMPUTERIZED TRANSACTION PROCESSES**

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of U.S. Application Serial No. 09/823,125, entitled "APPARATUS, METHODS AND ARTICLES OF MANUFACTURE FOR CONSTRUCTING AND EXECUTING COMPUTERIZED TRANSACTION PROCESSES AND PROGRAMS", filed on March 30, 2001, by Hernan G. Otero, Steven B. Horn and John Tumilty, which disclosure is incorporated herein by reference.

FIELD OF THE INVENTION

This invention relates to apparatus, methods and articles of manufacture for computerized transaction execution and processing. More particularly, this invention relates to apparatus, methods and articles of manufacture for client-server transaction execution and processing.

BACKGROUND OF THE INVENTION

Transaction execution and processing usually requires sophisticated and customized computer systems. The subset of transaction execution and processing computer systems used in financial instrument trading are often even more complex, as these systems usually need to accept input from other systems as well as format output acceptable to other systems. These input and output needs mean that input and output must proceed according to specific formatting conventions, and systems designed to execute and process transactions should recognize those specific conventions.

Moreover, input and output may be across a number of other platforms and/or networks, including internal platforms and/or networks (if the systems are used within an enterprise), as well as external platforms and/or networks. These platforms and/or networks could exist presently as well as be created in some future time. Any input and output must usually also be secure, thus adding additional elements of complexity.

The need for complexity is often countered by the need for flexible and customizable implementation. Flexible and customizable implementation permits ease of use and implementation in any given existing environment, as well as implementation in future

environments, yet more complex systems may not be sufficiently customizable to make them practically useful.

Time, or execution speed, is also a factor in the design of such systems. Trading systems must usually execute and process transactions rapidly, especially when deployed in the area of trading financial instruments. Financial instruments transactions and processing involve values that may change from moment to moment, and any system implemented in this area must recognize the time sensitive nature of these financial transactions.

Enterprise-wide customization adds yet another level of time, effort and complexity. What may be useful in one enterprise business unit may not be useful in another, and time, effort and resources may not be available to implement specific programs customized for each business unit.

Finally, any implementations must be quite robust, and reliably and consistently execute trading strategies. The implementation of new computerized transactional programs must be as close to bullet proof as possible – failure of a trading program can mean losses in thousands, millions or even billions of dollars.

One specific area of interest to computerized transactional programs is the area of Order Management. In financial instrument trading, Order Management may be understood as communication taking place among two or more parties during a transaction. The communication may be simple, such as when a Customer instruct a Salesperson to purchase “One hundred shares of Microsoft,” and the order passes to simple execution from a firm’s internal inventory; or the communication may be more complex, as when a trader uses an algorithm such as Volume-Weighted-Average-Price or VWAP to trader on numerous exchanges throughout the day. Thus, it would be most desirable to have a computerized Order Management Network or System that aids communication among parties to a transaction. It would be even more desirable to have a computerized Order Management Network or System that enables quick, secure, robust and reliable communication among parties to a transaction, as well as among systems involved in a transaction. It would also be desirable that any such system be sufficiently flexible or customizable so as to allow communications to and from existing and future internal and external trading systems.

Accordingly, it is an object of this invention to provide apparatus, methods and articles of manufacture for constructing and executing transactions.

It is a further object of this invention to provide secure, customizable, fast, robust and reliable apparatus, methods and articles of manufacture for executing and processing financial instrument trading.

It is yet a further object of the present invention to have an computerized Order Management Network or System that aids in communication among parties to a transaction and systems involved in a transaction.

It is yet a further object of the present invention to have a computerized Order Management Network or System that enables quick, secure, robust, reliable, flexible and customizable communication among parties to a transaction and systems involved in the transaction.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a schematic diagram of a preferred embodiment.

Figure 2 shows a schematic diagram of a preferred embodiment.

Figure 3 shows a schematic diagram of a preferred embodiment.

SUMMARY OF THE INVENTION

The present invention provides apparatus, methods and articles of manufacture for construction and execution of computerized transaction processes. In the preferred embodiments, an architecture or toolkit of preferred components is used to permit the construction of customized systems. These customized systems can then be used in turn to implement computerized trading systems which manage and process transactions, including but not limited to orders and execution of orders in a trading environment or environments.

In the especially preferred embodiments, transaction management includes, but is not limited to, processing of an order through an exchange or exchanges. Transaction processing includes, but is not limited to, order processing. Order processing may include, but is not limited to providing complex orders to a system or systems for deconstruction as well as breaking down complex orders into simple orders for execution, as well as order execution.

Also the especially preferred embodiments are implemented in a distributed processing environment, thus providing greater reliability and fault tolerance.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiments of the present invention provide apparatus, methods and articles of manufacture to implement computerized trading systems which manage and process transactions in a trading environment or environments. In the preferred embodiments, an architecture or toolkit of preferred components is used to permit the construction of these customized Order Management Systems (OMS.) Thus, in the preferred embodiments, OMS's may be processing and managing orders with regard to Customers, the Sales Desk, Trading Desks, and/or Exchanges, and thus assure order flow between and among those parties. An integrated network of systems (an Order Management Network or OMN) to support electronic order flow or management may also be implemented, comprised of one or more OMS's.

The preferred embodiments are comprised of components written primarily in C++. Certain components may be assembled from preexisting tools and libraries such as the Rogue Wave collection of tools and libraries. C++ permits cross platform implementation to a great extent, which may be especially helpful if embodiments are implemented in a distributed computing environment. Of course, other embodiments may be translated into other languages. Therefore, the embodiments may be used across a wide variety of platforms.

Figure 1 shows a schematic diagram of a preferred embodiment in place in a trading environment, located largely within an enterprise shown generally at **a**. The OMN is an integrated network of systems to support electronic order flow, and comprises, in this embodiment, a number of OMS's as is explained further below.

The external trading parties, such as Customers, are shown outside the dotted line of the enterprise, and the internal trading parties, such as traders within the enterprise, are shown within the dotted line. Among the inputs and output from the parties are: Customer1 (10) trading by computer via the Internet, Customer2, (11) trading via a direct modem link, Customer3 (12) trading via a telephone connection to a Sales person (not shown); Trader1

(14) trading through an internal link, and Computerized Trading Program (15). Of course, in other embodiments, these parties may be different parties, be different in number, etc.

Each Order executed by each party is shown in the Figure as follows: Customer1 places Order 20, Customer2 places Order 2, Customer3 places Order 22, Trader1 places Order 23, and Computerized Trading Program places Order 24. The Orders pass through respective routing mechanisms not shown. In other embodiments, Order routing may take place in any number of ways known in the art.

From the routing mechanisms, the orders pass to an Order Management System or OMS. In the Figure, for descriptiveness, each Order is shown passing from a routing mechanism to a linked OMS. In other embodiments, the architecture of the routing may be different, for example, one or more of the routing mechanisms may feed to the same OMS, there may be no routing mechanism, etc.

Orders are processed through the various OMS's as is explained in further detail below. Before detailing the processing however, it might be helpful to understand Order flow, assuming all Orders entered are executed and pass through one or more Exchanges. Of course, Order processing also, in the preferred embodiments, processes Orders that are not executed, through communication failures, etc. In general, the term transaction information includes but is not limited to Order information such as execution information as well as non executed order information.

As can be seen in Figure 1, Orders pass from an OMS to an Exchange by way of a direct link, such as in known in the art. Routing of Orders and any other exchanges between various OMS's occurs by way of a global Router. The addressing mechanism is established by the various OMS's.

Turning now to Figure 2, and assuming the Exchanges have executed the order, the execution notifications (now identified with their respective Orders by way of an "A" suffix) will pass from the Exchanges directly to the OMS's, and from there ultimately to the appropriate parties. Any Routing of Orders and any other exchanges between various OMS's occurs by way of a global Router.

It should be noted that the OMN depicted in Figures 1 and 2, and Order flow as depicted herein is not the sole or a sole possible OMN, or the sole or a sole possible Order flow, but is only that of a preferred embodiment. In this embodiment and other preferred embodiments, order processing may be made more secure and robust. The various OMS's receive orders, and process those orders, discretely, so that system outages in other areas, such as for example, exchange failures, have limited impact on order processing. If, for example, the exchange or exchanges are unavailable, orders will continue to be processed through the OMS's, and new orders can enter the OMS's, while awaiting the outage resolution.

The preferred embodiment comprises a number of core components, available as a toolkit to construct specific OMS implementations. These core components consist of: a set of cooperating services which, in the especially preferred embodiments are implemented in a distributed computing environment; an in-memory cache, which can greatly assist performance, and, in the especially preferred embodiments may be implemented by ways of preexisting caching technology such as that from Persistence; one or more client API's, which may be open ended, that is, for existing and future interfaces; integration with internal enterprise product databases, which contain the details on various financial instruments, and which may be open ended interfaces, that is, may be modified as desired for existing and future databases; security and authorization components; as well as multi-threaded implementation.

By using open ended interfaces, the system may be linked as desired and is not dependant on one or more existing links or databases. For example, as the OMS's described above with respect to Figures 1 and 2 illustrate, the interfaces are to the Exchanges and a global Router, and can be written using methods known in the art.

The toolkit of the preferred embodiments may be used in various ways to implement various OMS's, and build one or more OMN's. In the especially preferred embodiments, one or more OMS's, appropriately constructed via the toolkit of the preferred embodiments, is used to provide services to one or more order processing systems, which may be used in assisting traders to execute complex orders such as trading algorithms. Such an order

processing system is disclosed in co-pending U.S. Application Serial No. 09/823,125, entitled "APPARATUS, METHODS AND ARTICLES OF MANUFACTURE FOR CONSTRUCTING AND EXECUTING COMPUTERIZED TRANSACTION PROCESSES AND PROGRAMS", filed on March 30, 2001, by Hernan G. Otero, Steven B. Horn and John Tumilty, incorporated herein by reference.

Turning now to Figure 3, flow through an preferred OMS embodiment is seen. A new Order is sent to a server or server where the Session Manager resides. The Session Manager may, in the preferred embodiments, reside on one or more systems, and so in the preferred embodiments it is written in Orbix, which is an implementation of the Common Object Request Broker Architecture (CORBA), used in distributed processing environments. The Order is sent to Session Manager by a Client API. Of course, in other embodiments, the Order may be sent to the server, or received by the server, by any method known in the art.

Each order obtains a session in the preferred embodiments, which assists in overall stability and verification of the order. From the Session Manager (operating at the Communications layer) the Order passes to the Entry Service for Validation. Validation includes here the process of ensuring the Order is in the proper format for subsequent order processing and is performed by the Validation Service. Validated Orders are also stored in a journal in order to provide recovery ability for the system.

Once the Validation Service notifies the Entry Service that the Order is as it should be, the Entry Service passes the Order to the Transaction Service, which determines how to apply the Order, and creates an appropriate Object for further processing. In order to perform its function, the Transaction Service monitors the system state. So, for example, if an order is of a type unavailable to the system, such as an Order when the exchange is not available, the Transaction Service will create an appropriate Order object. As another example, the Order may be an initial Order, as for example, Order 20 of Figure 1, the Transaction may be an execution, as for example 20A of Figure 2, etc. In the example of Order 20, the Transaction Service will create an Order Object, in the example of Execution 20A, an appropriate Execution Object, etc. This Object is then passed to the Collection Service, which is, in this embodiment, an in-memory database containing orders, their

executions and their history. The scope of the database can be as desired, that it, it can contain orders for a predetermined time period. The Collection Service also journals an order for later recovery, if necessary, in a Bookkeeping database.

The Transaction Service also sends the Object to the Notification service which determines which clients are to be notified of the order. The Notification Service decides who to notify, in the preferred embodiments, by determining which clients have registered for orders which interest the client. When an order is received by the Notification Service, the service will review or iterate through the registered client information and use that as its notification indicators. The Notification Service then passes the appropriate order information is then passed back to the Session Manger, which sends the order to the appropriate parties.

Other embodiments of the present invention may be used to build OMS's singly, as part of an OMN, or an OMN. Those other embodiments may use toolkits with preexisting components, so as to simplify construction; toolkits with preexisting groups of components, such as a toolkit only used for constructing Client-side OMS'S with appropriate API's; toolkits with preexisting interfaces to exchanges, routing mechanisms, and/or other inputs and outputs. Moreover, one or more orders may be generated from a single order through various other systems which input and/or output to one or more OMS's, and components of embodiments such as the Transaction Service may be suitably modified to process orders resulting from such input and/or output.

Accordingly, the above description and the views and material depicted by the figures are for purposes of illustration only and are not intended to be, and should not be construed as, limitations on the invention.

Moreover, certain modifications or alternatives may suggest themselves to those skilled in the art upon reading of this specification, all of which are intended to be within the spirit and scope of the present invention as defined in the attached claims.

CLAIMS

We Claim:

1. A method for transaction management and processing in a trading environment comprising:
 - providing an Order Management System for receiving Orders;
 - processing Orders, by way of said Order Management System, whereby processing Orders further comprising the steps of;
 - providing Orders from an Order Management System to an Exchange; and,
 - providing transaction information for Orders from an Exchange to an Order Management System; andwhereby said Order Management System comprises components selected from the group comprising; at least two cooperating services, in-memory cache, and client API.
2. A method as in claim 1 wherein the step of providing an Order Management System for receiving Orders further comprises providing said Order Management System in a distributed computing environment.
3. A method as in claim 1 wherein the step of providing an Order Management System for receiving Orders further comprises providing said Order Management System in a multi-threaded implementation.
4. A method as in claim 1 wherein said components are, at least in part, written in C++.

5. A method for order processing comprising;
 - accepting an Order through a client API;
 - providing, from said client API, said Order to a Session Manager;
 - providing a session for said Order;
 - transmitting said Order from said Session Manager to an Entry Service; and,
 - attempting to Validate said Order through a Validation Service.
6. A method as in claim 5 further comprising the step of failing to Validate said Order.
7. A method as in claim 5 further comprising the steps of:
 - validating said Order;
 - notifying an Entry Service through said Validation Service;
 - transmitting said Order from said Entry Service to a Transaction Service; and
 - creating an Object for said Order.
8. A method as in claim 7 wherein the step of creating an Object for said Order comprises creating an Order Object.
9. A method as in claim 7 wherein the step of creating an Object for said Order comprises creating an Execution Object.
10. A method as in claim 7 further comprising the steps of:
 - transmitting said Object to a Collection Service;
 - transmitting said Object to a Notification Service; and,
 - transmitting said Order to a Client API.
11. The Object of Claim 7.

12. The Order Object of Claim 8.

13. The Execution Object of Claim 9.

14. A method for constructing an Order Management System comprising:

- implementing at least two cooperating services components;
- implementing an in-memory cache component, and
- implementing a client API, for use on a distributed computing platform.

15. An Order Management System comprising at least two cooperating services, an in-memory cache, and a client API, implemented on a distributed computing platform.

16. An Order Management Network comprised of at least one Order Management System.

17. A toolkit for constructing an Order Management System comprising cooperating services components, in-memory cache components, and a client API.

18. A toolkit as in claim 17, wherein said cooperating services components further comprise; a Session Manager; an Entry Service; a Validation Service; a Transaction Service; a Collection Service; and a Notification Service.

19. A toolkit as in claim 17 wherein said cooperating service components are written, at least in part, in C++.

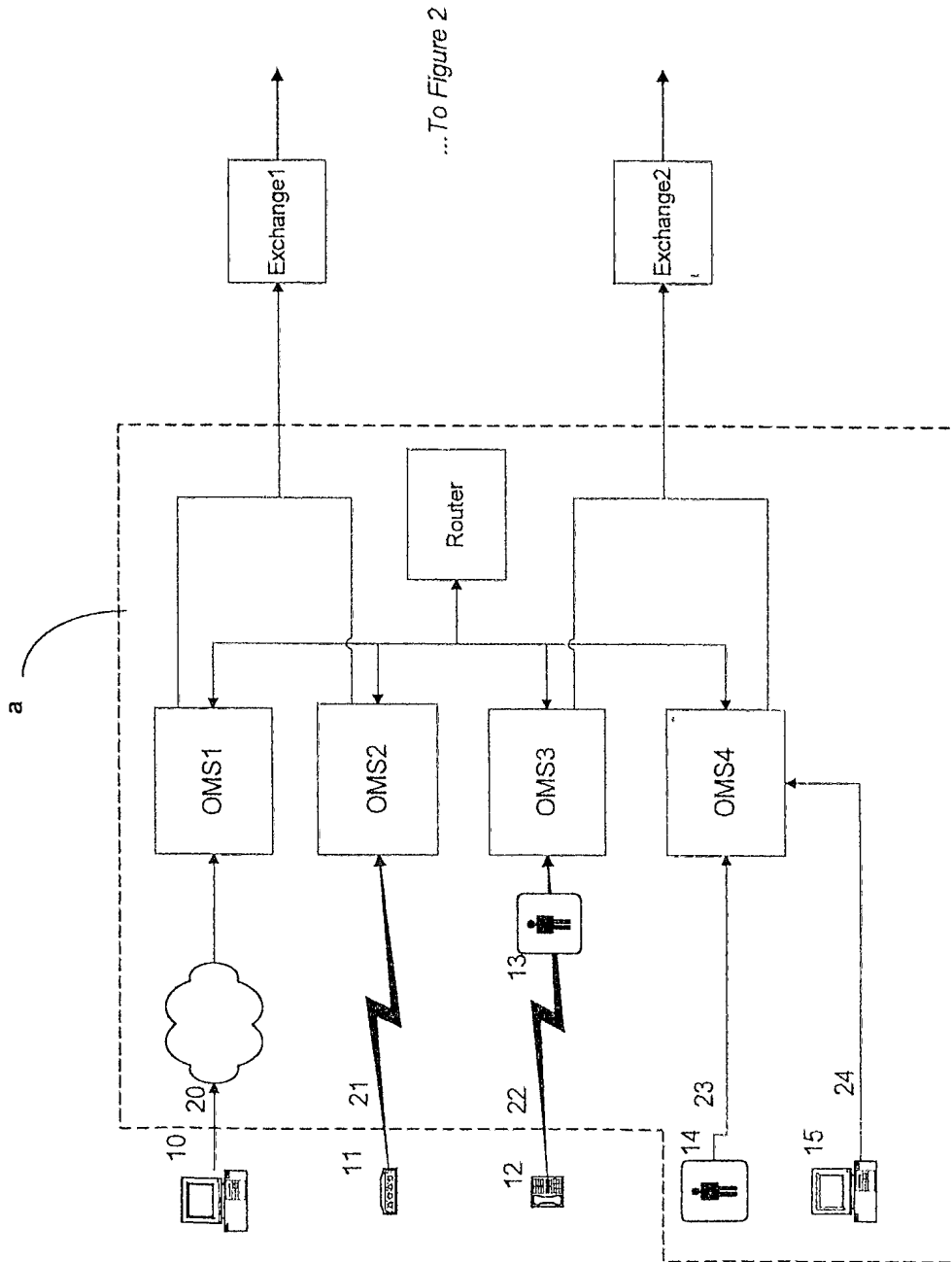


Figure 1

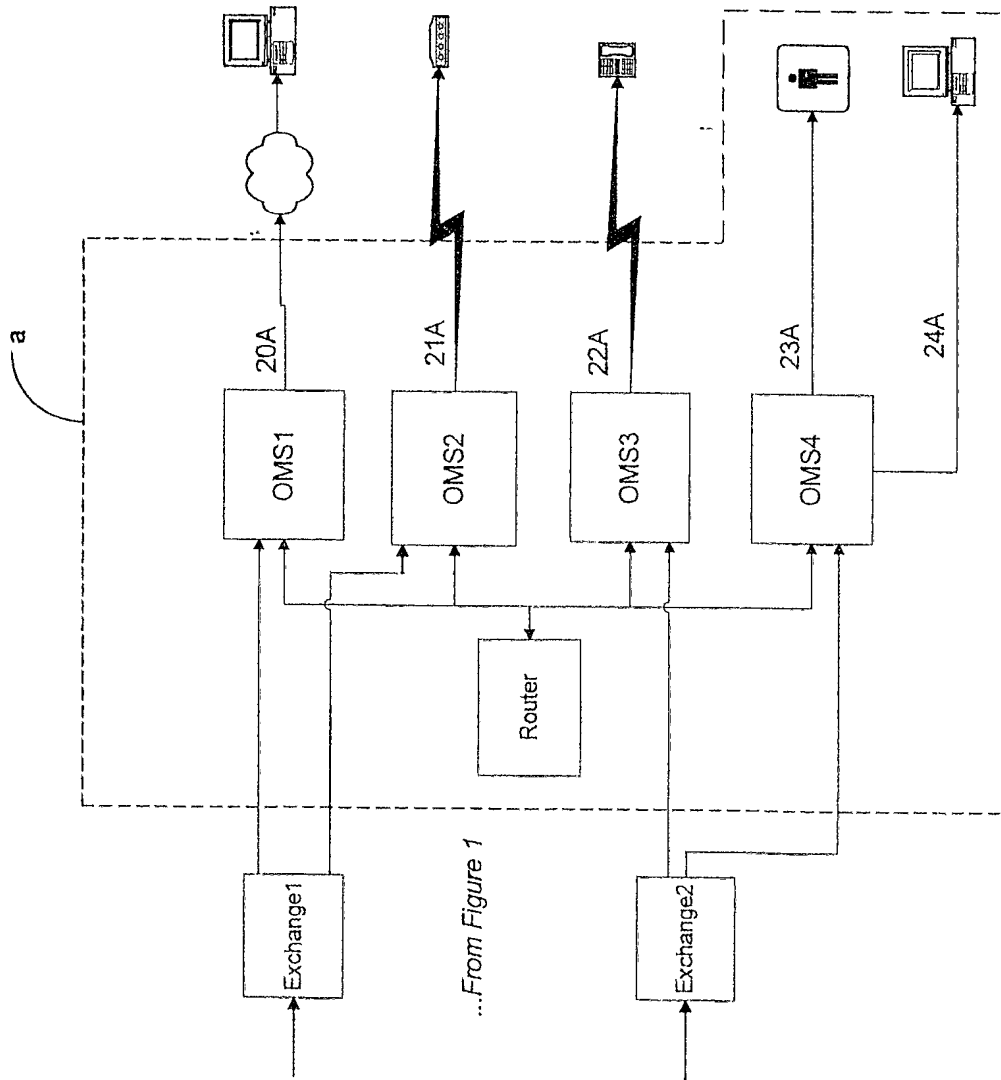


Figure 2

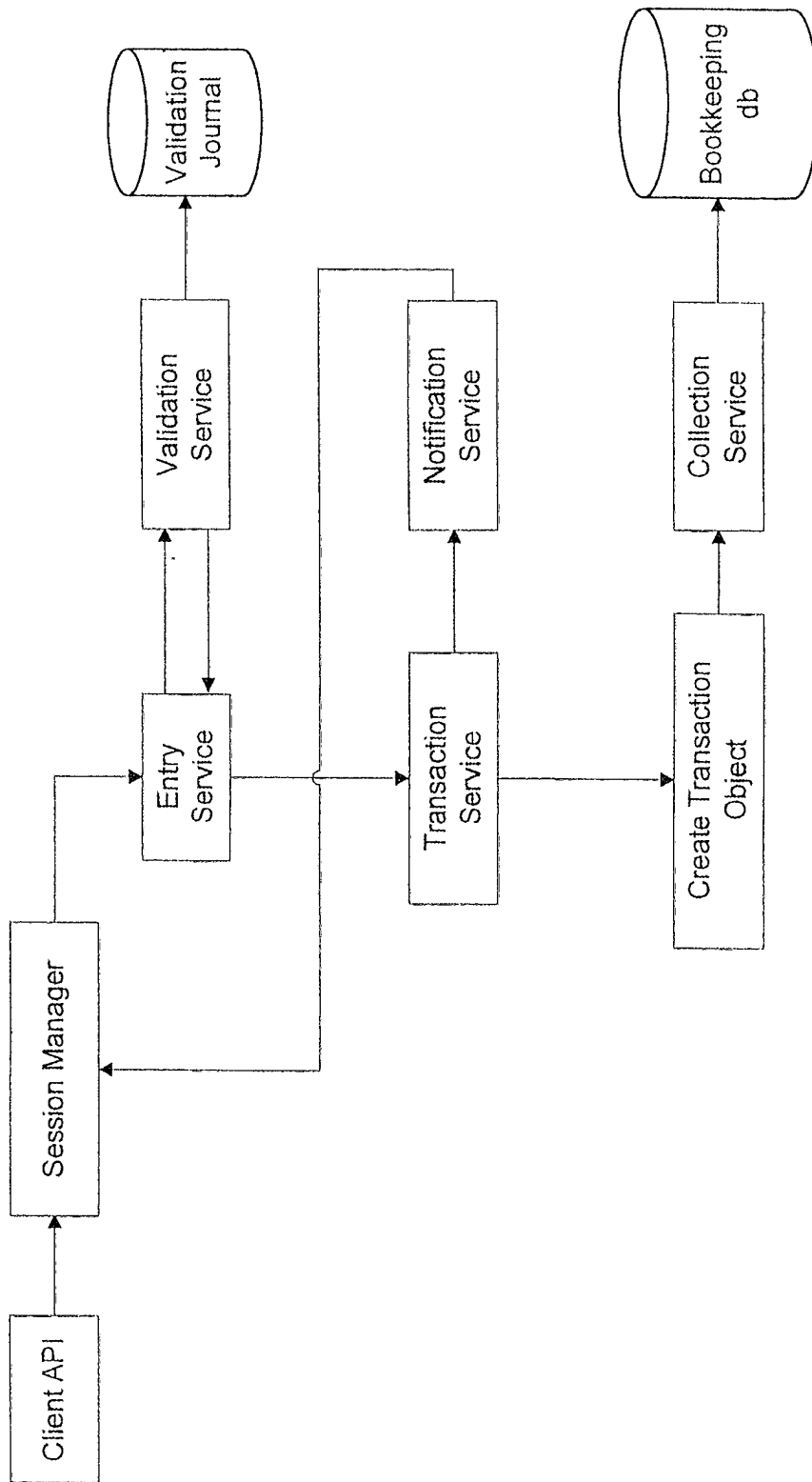


Figure 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/32024

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 17/60
 US CL : 705/37

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 U.S. : 705/37, 35, 36; 340/825.26, 825.27; 707/104.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 USPAT, JPO, EPO, Derwents WPI, IBM TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	US 6,026,440 A (SHRADER et al.) 15 February 2000 (15.02.2000), see abstract and entire document.	1-19
A	US 5,434,395 A (STORCK et al.) 18 July 1995 (18.07.1995), see abstract.	1-19

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	
"P"	document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search

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(54) Title: APPARATUS, METHODS AND ARTICLES OF MANUFACTURE FOR CONSTRUCTING AND EXECUTING COMPUTERIZED TRANSACTION PROCESSES AND PROGRAMS

(57) Abstract: Open-ended apparatus, methods and articles of manufacture for constructing and executing transaction processes and programs are shown. These apparatus, methods and articles of manufacture are primarily used in computerized trading processes.

**APPARATUS, METHODS AND ARTICLES OF MANUFACTURE FOR
CONSTRUCTING AND EXECUTING COMPUTERIZED TRANSACTION
PROCESSES AND PROGRAMS**

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is related to provisional application U.S. Serial No. 60/241,807, by John A. Fanelli, Steven B. Horn, Hernan G. Otero and John Tumilty, which disclosure is incorporated herein by reference.

FIELD OF THE INVENTION

This invention relates to apparatus, methods and articles of manufacture for computerized transaction execution and processing. More particularly, this invention relates to apparatus, methods and articles of manufacture for client-server transaction execution and processing.

BACKGROUND OF THE INVENTION

Computerized transaction execution and processing requires an enormous, and often detrimental, amount of time and resources. The time and resources are required because, in most instances, execution and processing are based upon customized implementations of the transaction.

Customized transaction implementations require new programming. New programming requires cost and effort – not only for the first attempt, but also for the debugging and testing processes. Moreover, once the program is debugged and released, real world implementations require yet further testing and debugging.

All this effort takes resources and time. It takes resources because the programmers must first develop the program with input for the uses, and then the users themselves must test the program in the field, to ensure reliable operation. The effort required means that the users may be too busy doing their job to assist in programming efforts. Thus the program may not ever be developed. Moreover, by the time any particular program is developed, the markets may have shifted away from the initial transactional conditions that first provided the impetus for developing the program. For example, specific trading strategies are usually constructed and executed on a customized basis, yet by the time the program is developed for those strategies, and those strategies are executed, they may be no longer useful.

The cost, effort and time factors are not solely the result of required programming. In trading transactions, the programmers must be advised by the traders or other business professionals regarding desired trading strategies and desired markets. These professionals are busy in their own right – they may have little or no time to advise the programmers on what new strategies and markets should be developed. Even if they can advise the programmers, trading strategies can become quite complex, and in order to communicate those strategies and implement those strategies effectively, the programmer and trader interactions cost time, money and resources.

Enterprise-wide customization adds yet another level of time, effort and complexity. What may be useful in one enterprise business unit may not be useful in another, and time, effort and resources may not be available to implement specific programs customized for each business unit.

Finally, any implementations must be quite robust, and reliably and consistently execute trading strategies. The implementation of new computerized transactional programs must be as close to bullet proof as possible – failure of a trading programs can mean losses in thousands, millions or even billions of dollars. Developing reliable implementations of trading programs means that testing procedures and recovery procedures must always be paramount considerations.

Accordingly, it is an object of this invention to provide apparatus, methods and articles of manufacture for constructing and executing transactions.

It is a further object of this invention to provide open-ended apparatus, methods and articles of manufacture for constructing and executing transaction processes and programs.

It is a further object of this invention to provide robust and reliable apparatus, methods and articles of manufacture for implementing trading strategies.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic diagram of a preferred embodiment.

Figure 2 is a schematic diagram of a preferred embodiment.

Figure 3 is a screen shot of a preferred embodiment.

Figure 4 is a screen shot of a preferred embodiment.

Figure 5 is a screen shot of a preferred embodiment.

Figure 6 is a schematic diagram of a preferred embodiment.

Figure 7 is a schematic diagram of a preferred embodiment.

Figure 8 is a flow chart of a preferred embodiment.

Figure 9 is a flow chart of a preferred embodiment.

SUMMARY OF THE INVENTION

The present invention provides apparatus, methods and articles of manufacture for open-ended construction and execution of computerized transaction processes. In the preferred embodiments, an engine is used that permits "plug-ins" to be used for construction, modification and alteration of trading procedure execution. These plug-ins can be pre constructed, or constructed when appropriate, and applied to the engine when desired.

In the preferred embodiments, the plug-ins comprise two types. The first type comprise algorithms used in trading. The second type comprise market-specific rules. Thus, for example, in the preferred embodiments, the engine can be configured with a specific algorithm and for a specific market for a first trade and then modified for another specific algorithm and another specific market for a second trade. In the especially preferred embodiments, the engine will carry out a number of trades using a specific algorithm, which has been chosen from a set of reconfigured algorithms. Moreover, the market plug-ins, having been set upon installation for use in a particular market, will be maintained for a predetermined or static period of time.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiments of the present invention provide apparatus, methods and articles of manufacture that have a number of characteristics in order to provide open-ended construction and execution of computerized trading processes. The preferred embodiments are constructed in Java which is essentially a platform independent language. Standard Java features are used in order to permit consistency among various Java versions. Use of Java permits convenient tracking of modifications and revisions of these embodiments, through Java features such as javadocs, introspection, reflection and the like. Of course, other embodiments may be

translated into other languages. Therefore, the embodiments may be used across a wide variety of networked platforms.

Figure 1 shows a schematic diagram of a preferred embodiment. At 10 is shown the engine infrastructure of the preferred embodiment. Written in Java, and present on the server, this software enables various data, plug-ins, applications, processes, and algorithms to be used in order to customized the trading process. These data, plug-ins, applications, processes, and algorithms are imported or plugged into the engine as desired in order to implement a particular trading strategy.

Seen in Figure 1 are various processes to be used in the engine 10. Area A of engine 10 symbolizes the area in which the plug-ins can be placed. Also seen at 10 is an area labeled "Market Specifics." This area, also supporting customization through data, plug-ins, applications, processes, and algorithms permits customization of any particular algorithm for any particular market in a manner explained in further detail below. In other embodiments, the plug-ins used for the various areas can be internal or external to the engine. Hereinafter, "plug-ins" will be used as a general term for data, plug-ins, applications, processes, and algorithms.

Engine 10, in this embodiment, provides services for the plug-ins. For example, most trading strategy plug-ins will need to access market data. Most trading strategy plug-ins will need to send orders to the exchange and be notified of executions, etc. Engine 10 provides these and other services to the plug-ins. For example in a preferred embodiment, engine 10 provides:

- A real time market data feed driver (e.g. Reuters SSL, TIB/Rendezvous feeds.)
- An exchange driver where the algorithm sends orders and receives executions back.
- A driver implementation that sends orders to one or more order management architecture(s) and/or system(s) server(s) is provided.
- An input driver which enters requests to the engine 10.

Figure 2 shows Process 1 implemented in engine 10. Process 1 might be a trading process such as Volume-Weighted-Average-Price or VWAP. The VWAP algorithm used in this embodiment, attempts to match the VWAP for a given instrument, such as an equity throughout a specified lifespan (e.g. throughout the full trading day). VWAP will maintain a number of limit orders in the market at different

price levels. In order to trade according to the VWAP algorithm of this embodiment, the engine will listen to market data throughout the day and access a volume profile to match the day's VWAP as close as possible.

The trader will then be able to review, thorough his screen, the order as it is being executed according to the VWAP algorithm. Any updates and/or changes will be simply made through his or her screen.

If a second VWAP algorithm was desired to be used, such as one that is based on theoretical values to trading, this second plug-in can be substituted for the first in the engine. This second plug-in will then be used by the engine.

Returning to Figure 2, the Market Specifics plug-in 1 has been chosen. Market specifics provide specific variables, data and other plug-ins necessary for the specific market in which the embodiment is being used. For example, they may be different limits on trading volume in one market versus another. The preferred embodiments permit configuration and modification of these Market Specifics, by plug-ins, so that the may be used in a variety of markets as desired.

In the preferred embodiments, the plug-ins comprise two types. The first type comprise algorithms used in trading. The second type comprise market-specific rules. Thus, for example, in the preferred embodiments, the engine can be configured with a specific algorithm, such as a first VWAP algorithm and for a specific market for a first trade such as the New York Stock Exchange and then modified for another specific algorithm such a Ratio algorithm and another specific market such as the Tokyo Stock Exchange for a second trade. In the especially preferred embodiments, the engine will carry out a number of trades using a specific algorithm, which has been chosen from a set of reconfigured algorithms. The algorithm used may be parameterized by the trader, in order to execute specific trades for a specific stock, price and number of shares. In these embodiments, the algorithm plug-in used is usually consistently used for that implementation of the embodiment during that particular trading period – whether it be an hour, day, week, etc. Of course, other embodiments may change their algorithm during any particular trading period. Moreover, the especially preferred embodiments usually maintain the market plug-in for at least the trading period, and usually longer. A trader, for example, may trade exclusively on the New York Stock Exchange using a preferred embodiment. Note that, using the especially preferred

embodiments, the trader will change the algorithm plug-in, embodying his or her trading strategy, much more frequently than his or her market plug-in, as he or she may only trade in a particular market. Network or enterprise wide implementations, however, will use the market plug-in order to configure any particular implementations for traders in the various trading markets.

This embodiment also effectively provides real-time monitoring of the order by the trader as well as others such as the sales force who desire to monitor the order and its execution. Additionally, orders are fully integrated, and so the trader or others may override individual orders through the system of this embodiment, without an additional messaging system. Similarly, any changes to an order, such as size of the order or a price limit or volume can be echoed to the system of this embodiment and the system will automatically adjust its trading to the new parameters.

Various screen shots of the administration and monitoring tool GUI (written in Java, using Swing) used in a preferred embodiment are shown at Figures 3 through 5. These are an Order Tracker screen shown in Figure 3, an Algorithm Configuration screen shown in Figure 4, and an Order Details screen shown in Figure 5. This tool allows for configuring algorithms as well as monitoring the server. This tool may be installed on either or both of the client and server machines and on more than one machine in the networked environment.

In the preferred embodiments, an algorithm is comprised of an Algorithm Context, which may be a Java Class, plus a set of event-action mappings. These algorithms are usually written by a programmer. The mappings may be modified by non-programmers (e.g. a trader) via the graphical tool. The mappings provide a powerful way to fine tune the algorithm. Of course other embodiments may modify the mappings in a different fashion. For example, the programmer may provide the trader or other end user with objects that constitute events, conditions and actions. The trader can then construct his or her own algorithms which are plugged into the invention in order to provide the trader with an automatic execution mechanism.

Other algorithms that may be used in this embodiment include:

Ratio which tries to buy an instrument and sell a related instrument when the price between the two is more favorable than a specified ratio.

Gamma Hedge which hedges a portfolio and tries to capture volatility while doing so.

Aggressive Short Sell which tries to short sell a given instrument by making sure the Tokyo short sell rule is not violated.

Stop Loss which allows sending stop loss orders to exchanges that do not support this concept.

Iceberg which tries to trade a specified number of shares by sending only a part of the total order's quantity (the tip of the iceberg) to the market at any given time.

Auto Trader which decides whether to send trades to the market or fill from an account.

CB Delta Hedge which sends out underlying market orders to hedge CB trades.

Of course, other algorithms or plug-ins may be used. Additionally, in the preferred embodiments, preferred methods of constructing and implementing new plug-ins are used. The preferred embodiments also use several Java features, e.g. introspection, reflection and the like, in order to automatically discover properties of the imported algorithms.

If new algorithms are desired, a number of methods can be used to create the algorithm. In this embodiment, if the new algorithm requires no Java code, then the algorithm can be created by leveraging on existing algorithm context classes. Specific classes have been established or predetermined in the preferred embodiments. If the new algorithm is simple enough, it can be created without writing any Java code, making use of the Administrator GUI. This can be done by simply creating a set of event-action mappings that will work on a pre-existing algorithm context class (e.g. the base AlgorithmContext class that is part of the preferred embodiments code classes).

Figures 6 and 7 show how various mappings or parts may be used to construct combinations. Those combinations, constructed in Figure 3, are then inserted into the

engine 20 in Figure 7. Note that a different Market Specifics plug-in, Market Specifics 2, has been chosen in Figure 7. These Market Specifics plug-ins may be from a predetermined set or constructed "on the fly." In the especially preferred embodiments, the market plug-in is usually maintained over some static trading period. A trader, for example, may trade exclusively on the New York Stock Exchange, using the market plug-in. In enterprise installations, the market plug-ins may be set for the particular trading markets across the enterprise, and remain as set for a predetermined or static period of time.

If the new algorithm requires writing new code, the fundamental classes within the architecture of the preferred embodiment are: AlgorithmContext, Action, ActionBindings, ActionDispatcher. New Actions might be needed, for new complex algorithms, in order to do simple tasks that the existing actions can not deal with. Algorithms which require saving state during the execution of the order, for example, need to have their own Algorithm Context subclass. The data will then be kept in this new subclass.

The following process is used in the preferred embodiment to place the code in a specific class. First, a meaningful Name and package must be chosen. Next, the Directory Structure must be created, according Java's requirement that classes be placed in a directory structure which corresponds to the package structure of the class. A Simple Algorithm Context must be written, starting with a template of what the class should look like, providing an empty, public constructor, adding in member variables, and providing a public getter/setter pair. Since this preferred embodiment makes use of beans support classes to access properties, JavaBeans conventions are used when naming these methods. Finally, in order to track the revisions, this embodiment uses a CVS Control System.

It is important to note that, in the preferred embodiments, traders provide vital feedback and oversight. Moreover, the embodiments evolve through use. There may be a lengthy tuning and feedback phase of algorithm development. The embodiments fit within a scalable architecture, and as the algorithms become more complex and widely used, the embodiments adapt and scale. Additionally, the embodiments must have fast Release Cycles. The preferred embodiments are flexible and separate the algorithm from the engine. Also, the algorithm should as orthogonal as possible to the

rest of the system. By use of this structure in the preferred embodiments, the embodiments can be used to trade and transact across virtually any instruments or exchanges.

In the preferred embodiments, the algorithms are tested for use. Of course, in other embodiments testing may not be desired. There are two main testing stages in a preferred embodiment. The first stage involves soliciting feedback with the traders and salespeople using the algorithm. The algorithm will not work right the first time, situations will not have been thought of, parameters will be wrong, failsafes will not be good enough and so on. The feedback at this early stage of development ensures not only a quick release but also that modifications can be made *in situ*.

The second stage of testing in this embodiment involves the continued evolution and updating of an algorithm once it is in production. It is important to have a very extensive series of tests that cover a multitude of trading situations. When changes are made to an algorithm, no matter how slight, every test is run and verified. This is necessary for production systems with a large number of users. Without high confidence that any changes made will not have any unforeseen follow-on effects, the release cycle becomes intolerably long. Of course, other embodiments may utilize different testing methods, including providing sample market feeds rather than real time feeds. The term "executing a trade" and its variants as used herein is meant to cover both actual and simulated execution of a trade.

The preferred embodiments implement a recovery mechanism, which assists the programmer in analyzing and/or recovering from crashes. The recovery process restores execution of orders by taking a number of steps. Those steps comprise:

Recovering the state of the orders. This involves rebuilding the order hierarchy (parent/child relationships, executed quantities, etc.) as it existed prior to the crash.

Recovering the exchange information. This involves making sure that all executions/corrections/cancellations that might have been pending when the embodiment crashed and had taken place during its blackout now get reflected in the embodiment's order hierarchy. This is done so

that future algorithm decisions get based on the current state of the world, and not the one present before the crash.

Restarting all algorithms. This is now possible since the algorithms will have their information up-to-date in order to make correct decisions on how to continue their execution. Depending on the complexity of the algorithms involved, this step may be as simple as setting up the event-action mappings for the algorithm context.

The recovery process in this embodiment includes writing to log or journal file. Of course other embodiments may have other recovery processes or recovery steps.

Figure 8 provides a flowchart summarizing processes of a preferred embodiment, from installation to trading. Figure 9 provides a flowchart summarizing a process for changing a plug-in. Other embodiments may have these processes or other processes with the same or similar steps in these or other orders.

The above description and the views and material depicted by the figures are for purposes of illustration only and are not intended to be, and should not be construed as, limitations on the invention.

Moreover, certain modifications or alternatives may suggest themselves to those skilled in the art upon reading of this specification, all of which are intended to be within the spirit and scope of the present invention as defined in the attached claims.

CLAIMS

We claim:

1. An apparatus for computerized trading comprising:
 - a first plug-in for implementing a trading strategy,
 - a second plug-in for implementing a trading strategy,
 - an engine for providing services to either of said first or second plug-in,
 - whereby said first plug-in is implemented in said engine in order to execute a trade.
2. An apparatus as in claim 1, wherein said second plug-in is implemented in said engine in order to execute said trade.
3. An apparatus as in claim 1, wherein said first plug-in further comprises an algorithm plug-in that is implemented by the engine.
4. An apparatus as in claim 1, wherein said second plug-in further comprises a market plug-in that is implemented by the engine.
5. An apparatus as in claim 1, wherein the first and second plug-ins, and the engine, are constructed in Java.
6. An apparatus as in claim 1, further comprising a third plug-in whereby said third plug-in is substituted for said first plug-in in said engine.
7. An apparatus as in claim 2, further comprising a fourth plug-in whereby said fourth plug-in is substituted for said second plug-in in said engine.

8. An apparatus for computerized trading comprising:
- a first, algorithm plug-in for implementing a trading strategy,
 - a second, market plug-in for implementing a trading strategy,
 - an engine for providing services to said first and second plug-ins, whereby said first and second plug-ins are implemented in said engine in order to execute a trade,
 - a third algorithm plug-in,
 - a fourth market plug-in,
- whereby either of said third or fourth plug-ins may be substituted for either of said first plug-in or second plug-in respectively, in said engine, in order to execute a trade.
9. The apparatus of claim 8 wherein said first and third algorithm plug-ins implement trading strategies selected from a group comprising:
- Volume Weighted Average Price;
 - Ratio;
 - Gamma Hedge;
 - Aggressive Short Sell;
 - Iceberg;
 - Auto Trader;
 - CB Delta Hedge;
 - Stop Loss; and
 - Short Sell.

10. A method for computerized trading comprising:
 - providing a first plug-in for implementing a trading strategy,
 - providing a second plug-in for implementing a trading strategy,
 - providing an engine for providing services to either of said first or second plug-ins, and,
 - executing a trade using said first plug-in implemented in said engine.
11. A method as in claim 10, wherein the step of executing a trade using said first plug-in implemented in said engine further comprises the step of using said second plug-in implemented in said engine in order to execute said trade.
12. A method as in claim 10, wherein the step of using said first plug-in implemented in said engine further comprises using an algorithm plug-in.
13. A method as in claim 11, wherein the step of using said second plug-in implemented in said engine further comprises using a market plug-in.
14. A method as in claim 10, wherein the steps of providing a first plug-in for implementing a trading strategy, providing a second plug-in for implementing a trading strategy, and providing an engine for providing services to either of said first or second plug-ins, further comprises providing Java versions of said first and second plug-ins and said engine.
15. A method as in claim 10, further comprising the step of providing a third plug-in.
16. A method as in claim 15, further comprising the step of substituting said third plug-in for said first plug-in in said engine.
17. A method as in claim 10, further comprising the step of providing a fourth plug-in.

18. A method as in claim 17, further comprising the step of substituting said fourth plug-in for said second plug-in.
19. A method for computerized trading comprising:
- providing a first, algorithm plug-in for implementing a trading strategy,
 - providing a second, market plug-in for implementing a trading strategy,
 - providing an engine for providing services to either of said first or second plug-ins,
 - implementing said first and second plug-ins in said engine,
 - providing a third algorithm plug-in,
 - providing a fourth market plug-in, and
 - substituting either of said third or fourth plug-ins for either of said first plug-in or said second plug-in respectively, in said engine, in order to execute a trade.
20. A method as in claim 19, wherein the step of providing a first algorithm plug-in for implementing a trading strategy, further comprise providing a first algorithm plug-in selected from a group comprising:
- Volume Weighted Average Price;
 - Ratio;
 - Gamma Hedge;
 - Aggressive Short Sell;
 - Iceberg;
 - Auto Trader;
 - CB Delta Hedge;
 - Stop Loss; and
 - Short Sell.

21. A method as in claim 19, wherein the step of providing a third algorithm plug-in for implementing a trading strategy, further comprise providing a third algorithm plug-in selected from a group comprising:
- Volume Weighted Average Price;
 - Ratio;
 - Gamma Hedge;
 - Aggressive Short Sell;
 - Iceberg;
 - Auto Trader;
 - CB Delta Hedge;
 - Stop Loss; and
 - Short Sell.
22. The method of claim 19, further comprising the step of initiating a recovery mechanism in the event of system failure.
23. An article for executing computerized trading comprising:
- a computer – readable signal bearing medium;
 - means in the medium for providing a first plug-in for implementing a trading strategy,
 - means in the medium for providing a second plug-in for implementing a trading strategy,
 - means in the medium for providing an engine for providing services to either of said first or second plug-in, whereby said first plug-in is implemented in said engine in order to execute a trade.
24. An article as in claim 23, further comprising means in the medium for providing a third plug-in for implementing a trading strategy.

25. An article as in claim 24, further comprising means in the medium for substituting said third plug-in for said first plug-in in said engine.

26. An article as in claim 23, further comprising means in the medium for providing a fourth plug-in for implementing a trading strategy.

27. An article as in claim 24, further comprising means in the medium for substituting said fourth plug-in for said second plug-in in said engine.

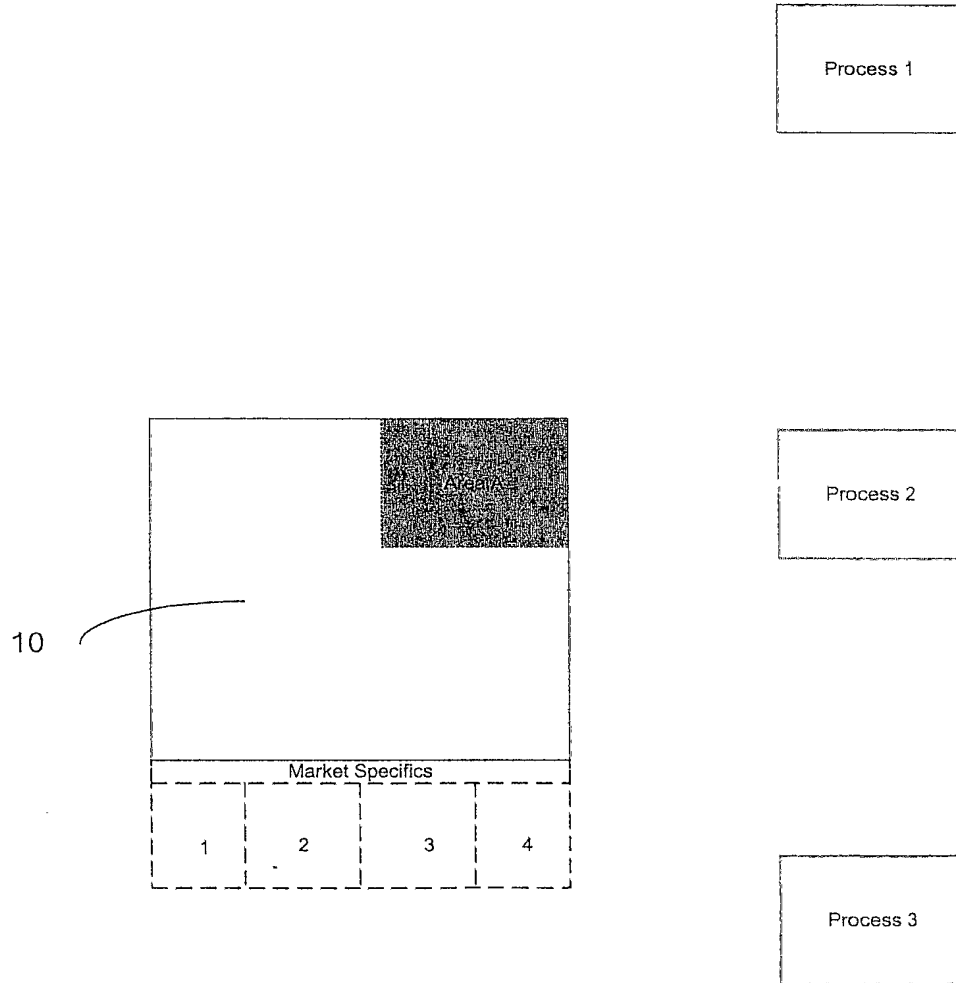


Figure 1

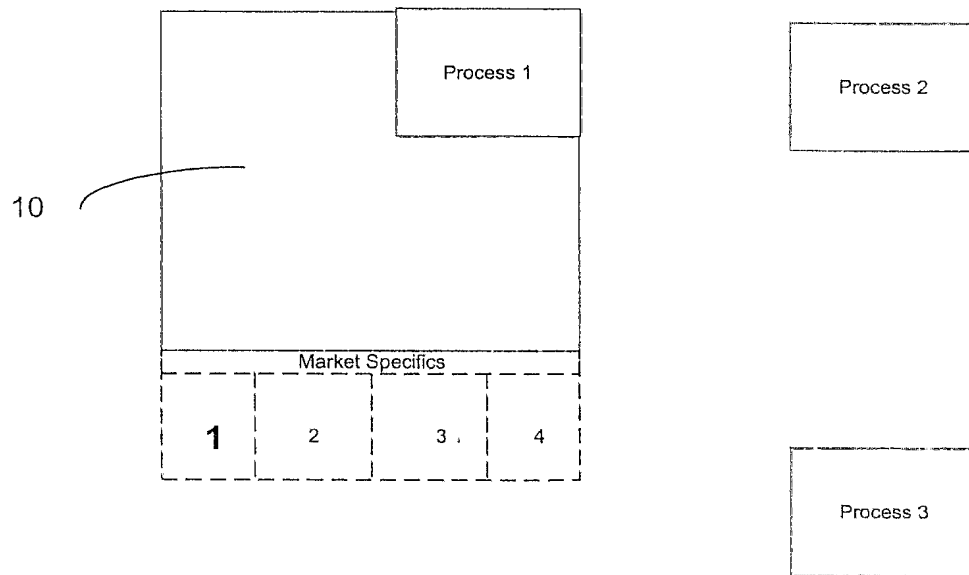


Figure 2

Administration Tool

File View Server Look'n'Feel Help

Order Tracker Algorithm Configuration Server Monitor

New Expand all Collapse ... Details Fire event Suspend Resume Cancel

all

Id	Created	Tag	Algorithm/Type	Side	Instrum...	Price	Quantity	Executed	To execute	% Com...	Susp.
clpher-46											
360	08:57:56		TWVWAP	Buy	AXP		200000.0	63351.0	138648.0	31.68	<input type="checkbox"/>
10680	10:51:56	MarketMaking-66	Limit	Buy	AXP	50.3125	2823.0	523.0	2300.0	18.53	<input type="checkbox"/>
420	09:07:30		TWVWAP	Buy	BUD		88470.0	21838.0	66632.0	24.68	<input type="checkbox"/>
10640	10:51:40	MarketMaking-48	Limit	Buy	BUD	78.875	1187.0	0.0	1187.0	0.0	<input type="checkbox"/>
440	09:08:38		TWVWAP	Buy	MO		247240.0	68292.0	178948.0	27.62	<input type="checkbox"/>
10480	10:49:12	MarketMaking-40	Limit	Buy	MO	28.1875	2899.0	0.0	2899.0	0.0	<input type="checkbox"/>
460	09:09:30		TWVWAP	Buy	UNH		45340.0	10777.0	34563.0	23.77	<input type="checkbox"/>
10660	10:51:50	MarketMaking-57	Limit	Buy	UNH	77.125	360.0	160.0	200.0	44.44	<input type="checkbox"/>
490											
700	09:19:09		TWVWAP	Sell	C		230130.0	72781.0	157348.0	31.63	<input type="checkbox"/>
10520	10:50:00	MarketMaking-68	Limit	Sell	C	60.5	3281.0	0.0	3281.0	0.0	<input type="checkbox"/>
720	09:19:55		TWVWAP	Sell	C		230100.0	74454.0	155646.0	32.36	<input type="checkbox"/>
10530	10:50:00	MarketMaking-69	Limit	Sell	C	60.5	3281.0	0.0	3281.0	0.0	<input type="checkbox"/>
850	09:22:18		TWVWAP	Buy	XOM		13600.0	3715.0	9885.0	27.32	<input type="checkbox"/>
950	09:23:54		TWVWAP	Buy	NOK		188200.0	62228.0	125872.0	33.06	<input type="checkbox"/>
920	09:23:58		TWVWAP	Buy	HON		180100.0	48113.0	131987.0	26.71	<input type="checkbox"/>
10690	10:51:58	MarketMaking-56	Limit	Buy	HON	53.375	1050.0	0.0	1050.0	0.0	<input type="checkbox"/>
10710	10:52:29	MarketMaking-57	Limit	Buy	HON	53.4375	690.0	0.0	690.0	0.0	<input type="checkbox"/>

Figure 3

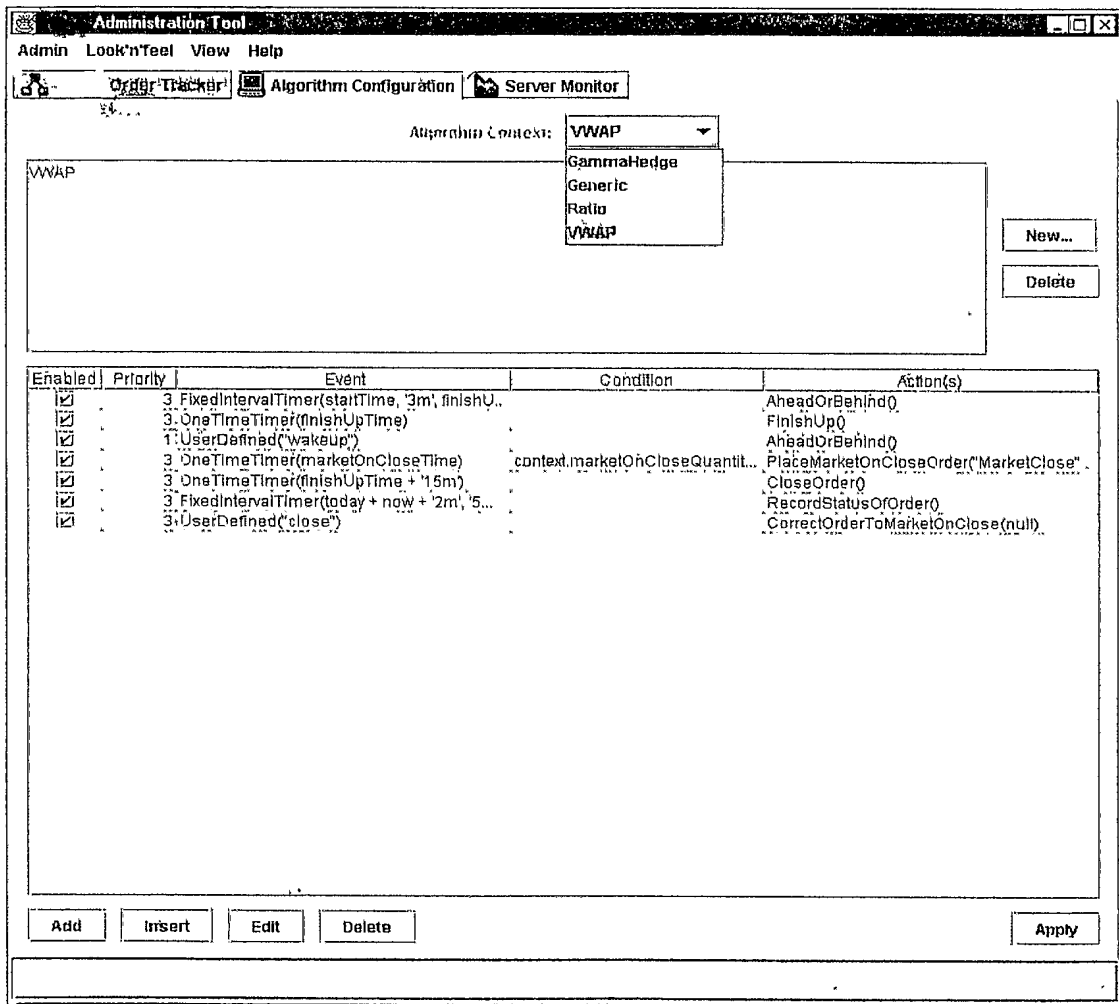


Figure 4

Buy 150,000 PEP (VWAP Order cipher-64556671) Details

Current state

Property	Expression
currentAPS	35.8833
targetQuantityMax	33848.0
targetQuantityMin	25152.0
currentMarketVWAP	35.8833
targetQuantity	29500.0
targetExtantQuantity	32400.0

Past activity

Time	Id	AlgorithmType	Sub...	Event	Action
12:56:14	cipher-6455...	VWAP		RepetitiveTimer(0)	AheadOrBehind
12:58:14	cipher-6455...	VWAP		RepetitiveTimer(0)	RecordStatusOfOrder
12:59:16	cipher-6455...	VWAP		RepetitiveTimer(1)	AheadOrBehind
13:02:18	cipher-6455...	VWAP		RepetitiveTimer(2)	AheadOrBehind
13:03:18	cipher-6455...	VWAP		RepetitiveTimer(1)	RecordStatusOfOrder
13:05:21	cipher-6455...	VWAP		RepetitiveTimer(3)	AheadOrBehind
13:08:18	cipher-6455...	VWAP		RepetitiveTimer(2)	RecordStatusOfOrder
13:08:23	cipher-6455...	VWAP		RepetitiveTimer(4)	AheadOrBehind

Future activity

Time	Id	AlgorithmType	Sub...	Event	Action
13:47:52	cipher-6455...	VWAP		RepetitiveTimer(17 (18/60))	AheadOrBehind
13:48:34	cipher-6455...	VWAP		RepetitiveTimer(10 (11/38))	RecordStatusOfOrder
13:50:54	cipher-6455...	VWAP		RepetitiveTimer(18 (19/60))	AheadOrBehind
13:53:36	cipher-6455...	VWAP		RepetitiveTimer(11 (12/39))	RecordStatusOfOrder
13:53:56	cipher-6455...	VWAP		RepetitiveTimer(19 (20/60))	AheadOrBehind
13:56:59	cipher-6455...	VWAP		RepetitiveTimer(20 (21/60))	AheadOrBehind
13:58:38	cipher-6455...	VWAP		RepetitiveTimer(12 (13/39))	RecordStatusOfOrder
14:00:01	cipher-6455...	VWAP		RepetitiveTimer(21 (22/60))	AheadOrBehind

Refresh OK

Figure 5

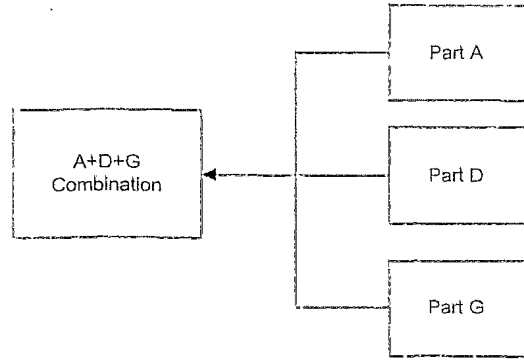
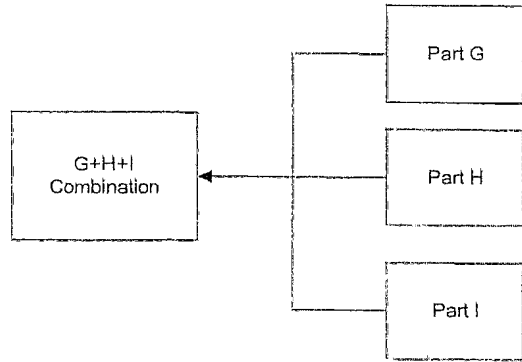
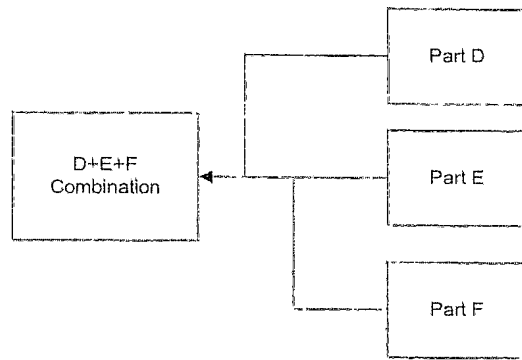
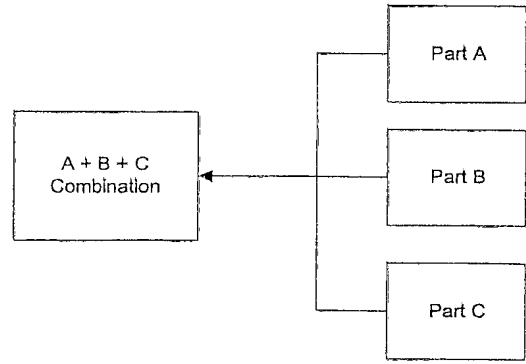
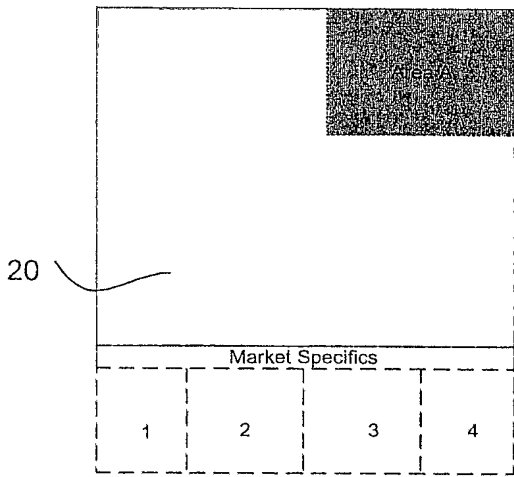


Figure 6

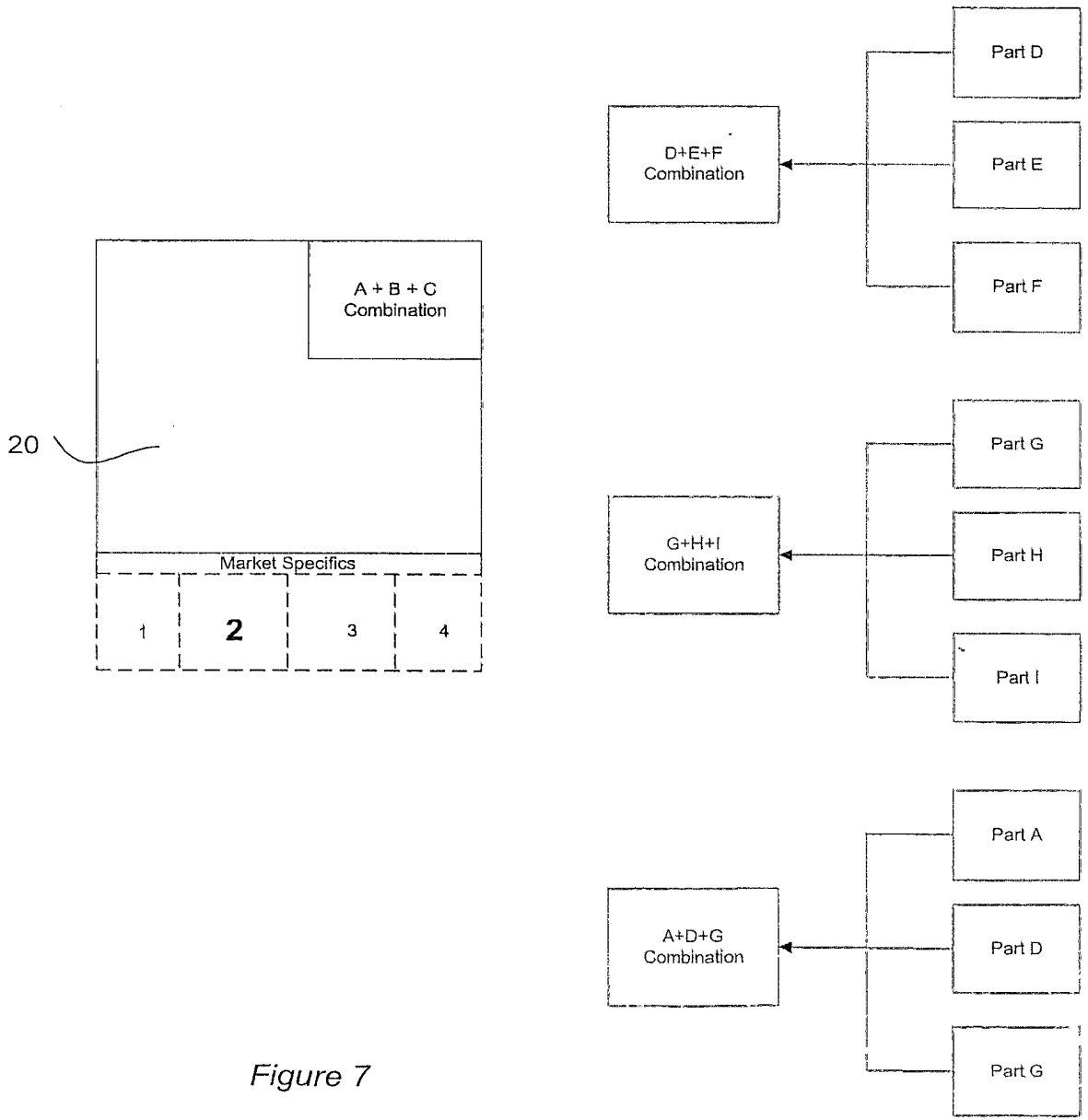


Figure 7

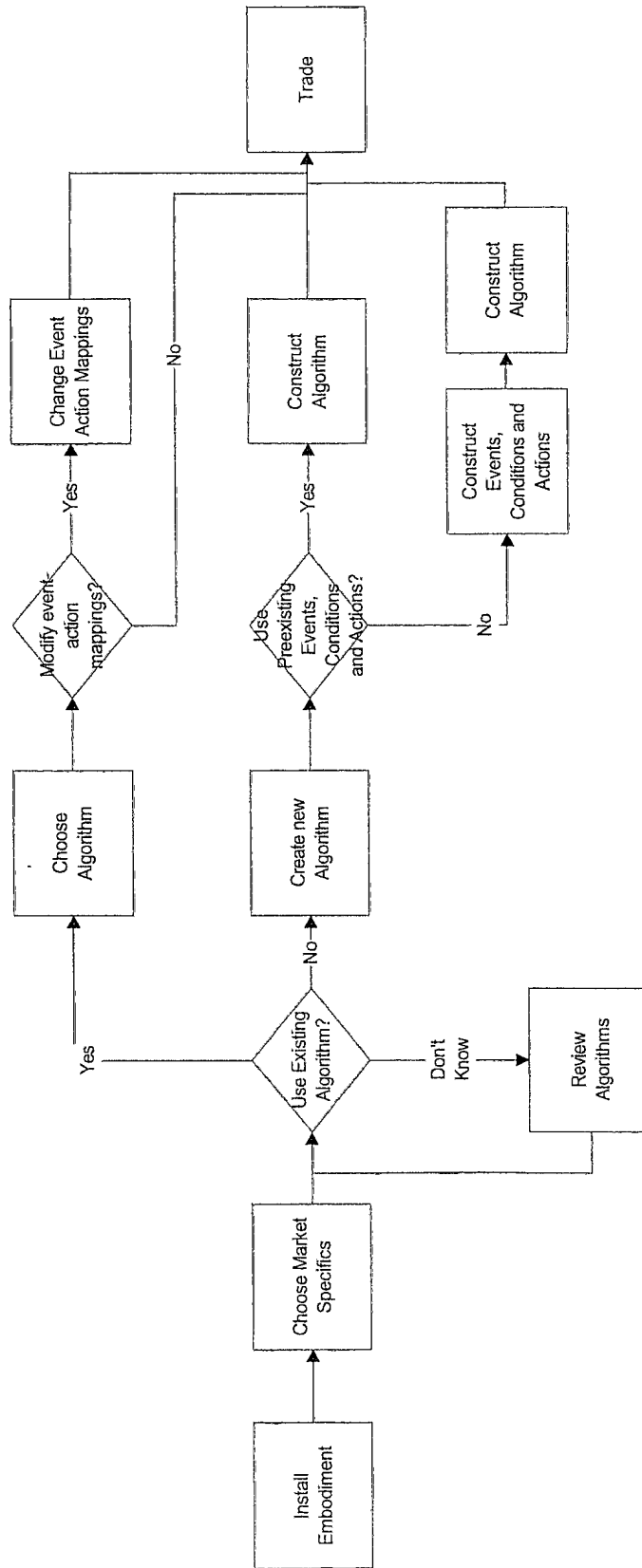


Figure 8

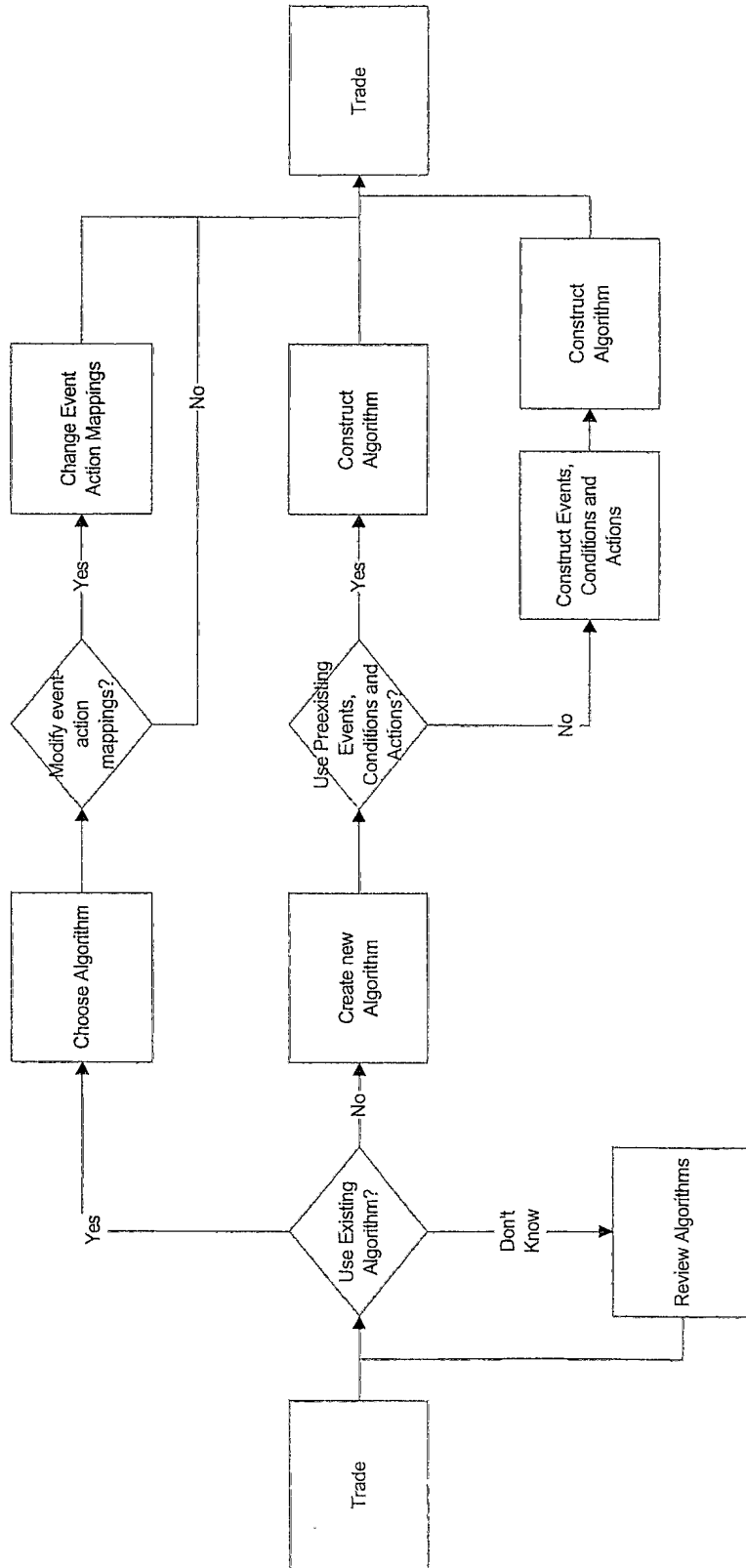


Figure 9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/42517

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According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) U.S. : 705/37, 35, 36; 340/825.26, 825.27; 707/104.1		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) USPAT, JPO, EPO, Derwents WPI, IBM TDB		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,119,104 A (BRUMBELOW et al.) 12 September 2000 (12.09.2000), see abstract and column 4, line 61 - column 5, line 5.	1-27
Y	US 6,026,440 A (SHRADER et al.) 15 February 2000 (15.02.2000), see abstract and entire document.	1-27
A	US 5,434,395 A (STORCK et al.) 18 July 1995 (18.07.1995), see abstract.	1-27
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family	
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Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230		Authorized officer Vincent Millin <i>Jessica R. Matthews</i> Telephone No. 703 305-3900 <i>703</i>

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(54) Title: APPARATUS, METHODS AND ARTICLES OF MANUFACTURE FOR CONSTRUCTING AND EXECUTING COMPUTERIZED TRANSACTION PROCESSES AND PROGRAMS

(57) Abstract: Open-ended apparatus, methods and articles of manufacture for constructing and executing transaction processes and programs are shown. These apparatus, methods and articles of manufacture are primarily used in computerized trading processes. In the especially preferred embodiments, transactional algorithms may be dynamically created and uses through "plug ins", which are executed by a logic engine in which uses various inputs and outputs to obtain necessary information, process the order, and execute the order.

**APPARATUS, METHODS AND ARTICLES OF MANUFACTURE
FOR CONSTRUCTING AND EXECUTING COMPUTERIZED
TRANSACTION PROCESSES AND PROGRAMS**

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is related to provisional application U.S. Serial No. 60/241,807, by Steven B. Horn, John A. Fanelli, Hernan G. Otero and John Tumilty, which disclosure is incorporated herein by reference; and

co-pending U.S. Serial No. application Ser. No. 09/773,139, entitled "APPARATUS, METHODS AND ARTICLES OF MANUFACTURE FOR CONSTRUCTING AND EXECUTING COMPUTERIZED TRANSACTION PROCESSES AND PROGRAMS" filed on January 31, 2001, by Hernan G. Otero, Steven B. Horn and John Tumilty, which disclosure is incorporated herein by reference.

FIELD OF THE INVENTION

This invention relates to apparatus, methods and articles of manufacture for computerized transaction execution and processing. More particularly, this invention relates to apparatus, methods and articles of manufacture for client-server transaction execution and processing.

BACKGROUND OF THE INVENTION

Computerized transaction execution and processing requires an enormous amount of time and resources. The time and resources are required because, in most instances, execution and processing are based upon customized implementations of the transaction.

Customized transaction implementations require new programming. New programming requires cost and effort – not only for the first attempt, but also for the debugging and testing processes. Moreover, once the program is debugged and released, real world implementations require yet further testing and debugging.

All this effort takes resources and time. It takes resources because the programmers must first develop the program with input from the users, and then the users themselves must test the program in the field, to ensure reliable operation. The

effort required means that the users may be too busy doing their job to assist in programming efforts. Thus the program may not ever be developed. Moreover, by the time any particular program is developed, the markets may have shifted away from the initial transactional conditions that first provided the impetus for developing the program. For example, specific trading strategies are usually constructed and executed on a customized basis, yet by the time the program is developed for those strategies, and those strategies are executed, they may be no longer useful.

The cost, effort and time factors are not solely the result of required programming. In trading transactions, the programmers must be advised by the traders or other business professionals regarding desired trading strategies and desired markets. These professionals are busy in their own right – they may have little or no time to advise the programmers on what new strategies and markets should be developed. Even if they can advise the programmers, trading strategies can become quite complex, and in order to communicate those strategies and implement those strategies effectively, the programmer and trader interactions cost time, money and resources.

Enterprise-wide customization adds yet another level of time, effort and complexity. What may be useful in one enterprise business unit may not be useful in another, and time, effort and resources may not be available to implement specific programs customized for each business unit.

Finally, any implementations must be quite robust, and reliably and consistently execute trading strategies. The implementation of new computerized transactional programs must be as close to bullet proof as possible – failure of a trading program can mean losses in thousands, millions or even billions of dollars. Developing reliable implementations of trading programs means that testing procedures and recovery procedures must always be paramount considerations.

Accordingly, it is an object of this invention to provide apparatus, methods and articles of manufacture for constructing and executing transactions.

It is a further object of this invention to provide open-ended apparatus, methods and articles of manufacture for constructing and executing transaction processes and programs.

It is a further object of this invention to provide robust and reliable apparatus, methods and articles of manufacture for implementing trading strategies.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic diagram of a preferred embodiment.

Figure 2 is a schematic diagram of a preferred embodiment.

Figure 3 is a screen shot of a preferred embodiment.

Figure 4 is a screen shot of a preferred embodiment.

Figure 5 is a screen shot of a preferred embodiment.

Figure 6 is a schematic diagram of a preferred embodiment.

Figure 7 is a schematic diagram of a preferred embodiment.

Figure 8 is a flow chart of a preferred embodiment.

Figure 9 is a flow chart of a preferred embodiment.

Figure 10 shows components of a preferred embodiment.

SUMMARY OF THE INVENTION

The present invention provides apparatus, methods and articles of manufacture for open-ended construction and execution of computerized transaction processes. In the preferred embodiments, an engine is used that permits "plug-ins" to be used for construction, modification and alteration of trading procedure execution. These plug-ins can be pre constructed, or constructed when appropriate, and applied to the engine when desired.

In the preferred embodiments, the plug-ins comprise two types. The first type comprise algorithms used in trading. The second type comprise market-specific rules. Thus, for example, in the preferred embodiments, the engine can be configured with a specific algorithm and for a specific market for a first trade and then modified for another specific algorithm and another specific market for a second trade. In the especially preferred embodiments, the engine will carry out a number of trades using a specific algorithm, which has been chosen from a set of preconfigured algorithms. Moreover, the market plug-ins, having been set upon installation for use in a particular market, will be maintained for a predetermined or static period of time.

In the especially preferred embodiments, the orders that result from the plug ins are executed by a logic engine which uses various interfaces in the form of inputs and

outputs to assist in processing orders. Complex orders are processed through deconstruction; breaking down complex orders into simple orders. Messaging and queuing is used throughout the preferred embodiments to ensure stability when executing orders.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiments of the present invention provide apparatus, methods and articles of manufacture that have a number of characteristics in order to provide open-ended construction and execution of computerized trading processes. The preferred embodiments are constructed in Java which is essentially a platform independent language. Standard Java features are used in order to permit consistency among various Java versions. Javadocs, as well as the tracking application CVS, permits convenient tracking of modifications and revisions of these embodiments. Of course, other embodiments may be translated into other languages. Therefore, the embodiments may be used across a wide variety of networked platforms.

Figure 1 shows a schematic diagram of a preferred embodiment. At 10 is shown the engine infrastructure of the preferred embodiment. Written in Java, and present on the server, this software enables various data, plug-ins, applications, processes, and algorithms to be used in order to customize the trading process. These data, plug-ins, applications, processes, and algorithms are imported or plugged into the engine as desired in order to implement a particular trading strategy.

Seen in Figure 1 are various processes to be used in the engine 10. Area A of engine 10 symbolizes the area in which the plug-ins can be placed. Also seen at 10 is an area labeled "Market Specifics." This area, also supporting customization through data, plug-ins, applications, processes, and algorithms permits customization of any particular algorithm for any particular market in a manner explained in further detail below. In other embodiments, the plug-ins used for the various areas can be internal or external to the engine. Hereinafter, "plug-ins" will be used as a general term for data, plug-ins, applications, processes, and algorithms.

Engine 10, in this embodiment, provides services for the plug-ins. For example, most trading strategy plug-ins will need to access market data. Most trading strategy plug-ins will need to send orders to the exchange and be notified of

executions, etc. Engine 10 provides these and other services to the plug-ins. For example in a preferred embodiment, engine 10 provides:

- A real time market data feed driver (e.g. Reuters SSL, TIB/Rendezvous feeds.)
- An exchange driver where the algorithm sends orders and receives executions back.
- A driver implementation that sends orders to one or more order management architecture(s) and/or system(s) server(s) is provided.
- An input driver which enters requests to the engine 10.

Figure 2 shows Process 1 implemented in engine 10. Process 1 might be a trading process such as Volume-Weighted-Average-Price or VWAP. The VWAP algorithm used in this embodiment, attempts to match the VWAP for a given instrument, such as an equity throughout a specified lifespan (e.g. throughout the full trading day). VWAP will maintain a number of limit orders in the market at different price levels. In order to trade according to the VWAP algorithm of this embodiment, the engine will listen to market data throughout the day and access a volume profile to match the day's VWAP as close as possible.

The trader will then be able to review, through his screen, the order as it is being executed according to the VWAP algorithm. Any updates and/or changes will be simply made through his or her screen.

If a second VWAP algorithm was desired to be used, such as one that is based on theoretical values to trading, this second plug-in can be substituted for the first in the engine. This second plug-in will then be used by the engine.

Returning to Figure 2, the Market Specifics plug-in 1 has been chosen. Market specifics provide specific variables, data and other plug-ins necessary for the specific market in which the embodiment is being used. For example, they may be different limits on trading volume in one market versus another. The preferred embodiments permit configuration and modification of these Market Specifics, by plug-ins, so that they may be used in a variety of markets as desired.

In the preferred embodiments, the plug-ins comprise two types. The first type comprise algorithms used in trading. The second type comprise market-specific rules. Thus, for example, in the preferred embodiments, the engine can be configured with a

specific algorithm, such as a first VWAP algorithm and for a specific market for a first trade such as the New York Stock Exchange and then modified for another specific algorithm such a Ratio algorithm and another specific market such as the Tokyo Stock Exchange for a second trade. In the especially preferred embodiments, the engine will carry out a number of trades using a specific algorithm, which has been chosen from a set of preconfigured algorithms. The algorithm used may be parameterized by the trader, in order to execute specific trades for a specific stock, price and number of shares. In these embodiments, the algorithm plug-in used is usually consistently used for that implementation of the embodiment during that particular trading period – whether it be an hour, day, week, etc. Of course, other embodiments may change their algorithm during any particular trading period. Moreover, the especially preferred embodiments usually maintain the market plug-in for at least the trading period, and usually longer. A trader, for example, may trade exclusively on the New York Stock Exchange using a preferred embodiment. Note that, using the especially preferred embodiments, the trader will change the algorithm plug-in, embodying his or her trading strategy, much more frequently than his or her market plug-in, as he or she may only trade in a particular market. Network or enterprise wide implementations, however, will use the market plug-in in order to configure any particular implementations for traders in the various trading markets.

This embodiment also effectively provides real-time monitoring of the order by the trader as well as others such as the sales force who desire to monitor the order and its execution. Additionally, orders are fully integrated, and so the trader or others may override individual orders through the system of this embodiment, without an additional messaging system. Similarly, any changes to an order, such as size of the order or a price limit or volume can be echoed to the system of this embodiment and the system will automatically adjust its trading to the new parameters.

Various screen shots of the administration and monitoring tool GUI (written in Java, using Swing) used in a preferred embodiment are shown at Figures 3 through 5. These are an Order Tracker screen shown in Figure 3, an Algorithm Configuration screen shown in Figure 4, and an Order Details screen shown in Figure 5. This tool allows for configuring algorithms as well as monitoring the server. This tool may be

installed on either or both of the client and server machines and on more than one machine in the networked environment.

In the preferred embodiments, an algorithm is comprised of an Algorithm Context, which may be a Java Class, plus a set of event-action mappings. These algorithms are usually written by a programmer. The mappings may be modified by non-programmers (e.g. a trader) via the graphical tool. The mappings provide a powerful way to fine tune the algorithm. Of course other embodiments may modify the mappings in a different fashion. For example, the programmer may provide the trader or other end user with objects that constitute events, conditions and actions. The trader can then construct his or her own algorithms which are plugged into the invention in order to provide the trader with an automatic execution mechanism.

Other algorithms that may be used in this embodiment include:

Ratio which tries to buy an instrument and sell a related instrument when the price between the two is more favorable than a specified ratio.

Gamma Hedge which hedges a portfolio and tries to capture volatility while doing so.

Aggressive Short Sell which tries to short sell a given instrument by making sure the Tokyo short sell rule is not violated.

Stop Loss which allows sending stop loss orders to exchanges that do not support this concept.

Iceberg which tries to trade a specified number of shares by sending only a part of the total order's quantity (the tip of the iceberg) to the market at any given time.

Auto Trader which decides whether to send trades to the market or fill from an account.

CB Delta Hedge which sends out underlyer market orders to hedge CB trades.

Of course, other algorithms or plug-ins may be used. Additionally, in the preferred embodiments, preferred methods of constructing and implementing new

plug-ins are used. The preferred embodiments also use several Java features, e.g. introspection, reflection and the like, in order to automatically discover properties of the imported algorithms.

If new algorithms are desired, a number of methods can be used to create the algorithm. In this embodiment, if the new algorithm requires no Java code, then the algorithm can be created by leveraging on existing algorithm context classes. Specific classes have been established or predetermined in the preferred embodiments. If the new algorithm is simple enough, it can be created without writing any Java code, making use of the Administrator GUI. This can be done by simply creating a set of event-action mappings that will work on a pre-existing algorithm context class (e.g. the base AlgorithmContext class that is part of the preferred embodiments core classes).

Figures 6 and 7 show how various mappings or parts may be used to construct combinations. Those combinations, constructed in Figure 3, are then inserted into the engine 20 in Figure 7. Note that a different Market Specifics plug-in, Market Specifics 2, has been chosen in Figure 7. These Market Specifics plug-ins may be from a predetermined set. In the especially preferred embodiments, the market plug-in is usually maintained over some static trading period. A trader, for example, may trade exclusively on the New York Stock Exchange, using the market plug-in. In enterprise installations, the market plug-ins may be set for the particular trading markets across the enterprise, and remain as set for a predetermined or static period of time.

If the new algorithm requires writing new code, the fundamental classes within the architecture of the preferred embodiment are: AlgorithmContext, Action, ActionBindings, ActionDispatcher. New Actions might be needed, for new complex algorithms, in order to do simple tasks that the existing actions can not deal with. Algorithms which require saving state during the execution of the order, for example, need to have their own Algorithm Context subclass. The data will then be kept in this new subclass.

The following process is used in the preferred embodiment to write code for a new algorithm. A Simple Algorithm Context must be written, starting with a template of what the class should look like, providing an empty, public constructor, adding in member variables, and providing a public getter/setter pair. Since this preferred

embodiment makes use of beans support classes to access properties, JavaBeans conventions are used when naming these methods.

It is important to note that, in the preferred embodiments, traders provide vital feedback and oversight. Moreover, the embodiments evolve through use. There may be a lengthy tuning and feedback phase of algorithm development. The embodiments fit within a scalable architecture, and as the algorithms become more complex and widely used, the embodiments adapt and scale. Additionally, the embodiments must have fast Release Cycles. The preferred embodiments are flexible and separate the algorithm from the engine. Also, the algorithm should be as orthogonal as possible to the rest of the system. By use of this structure in the preferred embodiments, the embodiments can be used to trade and transact across virtually any instruments or exchanges.

In the preferred embodiments, the algorithms are tested for use. Of course, in other embodiments testing may not be desired. There are two main testing stages in a preferred embodiment. The first stage involves soliciting feedback with the traders and salespeople using the algorithm. The algorithm will not work right the first time, situations will not have been thought of, parameters will be wrong, failsafes will not be good enough and so on. The feedback at this early stage of development ensures not only a quick release but also that modifications can be made in situ.

The second stage of testing in this embodiment involves the continued evolution and updating of an algorithm once it is in production. It is important to have a very extensive series of tests that cover a multitude of trading situations. When changes are made to an algorithm, no matter how slight, every test is run and verified. This is necessary for production systems with a large number of users. Without high confidence that any changes made will not have any unforeseen follow-on effects, the release cycle becomes intolerably long. Of course, other embodiments may utilize different testing methods, including providing sample market feeds rather than real time feeds. The term "executing a trade" and its variants as used herein is meant to cover both actual and simulated execution of a trade.

The preferred embodiments implement a recovery mechanism, which assists the programmer in analyzing and/or recovering from crashes. The recovery process restores execution of orders by taking a number of steps. Those steps comprise:

Recovering the state of the orders. This involves rebuilding the order hierarchy (parent/child relationships, executed quantities, etc.) as it existed prior to the crash.

Recovering the exchange information. This involves making sure that all executions/corrections/cancellations that might have been pending when the embodiment crashed and had taken place during its blackout now get reflected in the embodiment's order hierarchy. This is done so that future algorithm decisions get based on the current state of the world, and not the one present before the crash.

Restarting all algorithms. This is now possible since the algorithms will have their information up-to-date in order to make correct decisions on how to continue their execution. Depending on the complexity of the algorithms involved, this step may be as simple as setting up the event-action mappings for the algorithm context.

The recovery process in this embodiment includes writing to log or journal file. Of course other embodiments may have other recovery processes or recovery steps.

Figure 8 provides a flowchart summarizing processes of a preferred embodiment, from installation to trading. Figure 9 provides a flowchart summarizing a process for changing a plug-in. Other embodiments may have these processes or other processes with the same or similar steps in these or other orders.

Figure 10 shows a schematic diagram of an especially preferred embodiment. The Core Processing Area 30 is, in this embodiment, the logic engine which processes the order. The Core Processing Area 30 is shown with various interfaces in the form of inputs and outputs. The especially preferred embodiments of the present invention accept input and output from a variety of sources. The sources may change according to the embodiment and in the especially preferred embodiments, the nature of the financial instrument traded (e.g. a particular stock, bond, etc.) helps determine the input and output sources. (It should be noted that input includes but is not limited to inputting data feeds as well as data blocks, such as for example retrieving messages

from a message queue. Output includes but is not limited to outputting data feeds as well as data blocks, such as for example outputting messages to a message queue.)

The embodiment of Figure 10 is configured for trading stocks on the New York Exchange by way of Market Plug-In 31. Stock orders are entered into Ordering System 40 and/or Ordering System 41 (and any other ordering system that may be used) by a trader or another (“trader”) using a Graphic User Interface (“GUI”). The GUI provides the trader with the option of selecting various algorithm plug ins to be used. The ordering system in turn interfaces with the logic engine, or in the embodiment of Figure 10, with the Core Processing Area 30.

An order may be one of two types. One type of order, SimpleOrder, uses simple actions, such as Limit orders (e.g., “Sell 15,000 shares of Microsoft at 35”) or Market orders (e.g., “Buy 10,000 shares of Sun at Market”.) SimpleOrders are, in this embodiment, not sent to the Core Processing Area 30. Rather, they are executed by some other mechanism, such as by the ordering system, e.g., by 40B or 41B of the Ordering Systems 40 or 41 in Figure 10.

A second type of order, ComplexOrders, uses higher level algorithms such as Volume Weighted Average Price; Ratio; Gamma Hedge; Aggressive Short Sell; Iceberg; Auto Trader; CB Delta Hedge; Stop Loss; and Short Sell. ComplexOrders usually comprise one or more Suborders. These Suborders can be either other ComplexOrders (which can have further suborders, possibly several levels deep) or SimpleOrders.

For example, assume a trader places a ComplexOrder using a Ratio algorithm:

BUY 10,000 SUNW and SELL 15,000 MSFT whenever the Ratio between the two exceeds 1.2

This order can be deconstructed into two separate Actions, buying 10,000 shares of Sun and selling 15,000 shares of Microsoft, whenever a certain Event happens (the price of Sun over Microsoft exceeds 1.2.) Therefore, this ComplexOrder can be processed by the Core Processing Area 30, into two SimpleOrders, each with an Action (e.g. buying 10,000 shares of Sun) linked to an Event (e.g., when the price of Sun over Microsoft exceeds 1.2.) The two SimpleOrders can then be returned to the Ordering System through an appropriate output driver as is seen in Figure 10 with regard to, for example, Output Driver 33 and Ordering System 40B.

As can be seen by the above example, higher level algorithms used by ComplexOrders can be comprised of Events and Actions. Once the ComplexOrders are processed to Events and Actions by the logic engine of the preferred embodiments, each Event and Action can be repackaged and executed as a SimpleOrder.

Returning now to Figure 10, Ordering System 40 and Ordering System 41 interface with Core Processing Area 30 through input drivers and output drivers as described below. As the orders are entered into Ordering System 40, they form a queue in section 40A of Ordering System 40. The orders are then retrieved from the queue by Input Driver 32. Similarly orders from Ordering System 41A are retrieved by Input Driver 34. It should be noted that input drivers are configured according to the input data configuration, and the information input may vary based upon the instrument traded, the user's desires, etc. (The word "driver" and its variants are used herein to mean any code or data interface.) Other embodiments may accept different inputs, through different input drivers. In these embodiments, the drivers may change as the instruments and/or the nature of the trade changes.

Some of the preferred embodiments are able, if they need to, to off-load any computationally intensive calculations, by using a distributed processing module, which proceeds by messaging amongst the components, such as messaging the results of calculations from a calculation component to the Core Processing Area. This off-loading allows more efficient attention to the ordering tasks. Distributed processing also permits for use of "dynamic" constants in executing a complex order. Dynamic constants as that term is used herein are numbers that are used in an algorithm as constants, but also may change during the lifetime of the algorithm. For example, an off-line component may calculate certain alphas, used as constants, for an algorithm. These constants are then sent to the Core Processing Area to be used in future calculations of that particular algorithm. Thus, with a distributed processing system, the alphas may change, but the underlying algorithm remains the same.

Other inputs to the Core Processing Area 30 provide information necessary to execute the inputted orders by providing information on external conditions that may cause the Events and Actions of the order to be met. For example, in order to execute the Sun-Microsoft ComplexOrder example described above, the price ratio of Sun to Microsoft must be calculated by the Core Processing Area 30. In order to calculate the

price ratio, the prices of Sun and Microsoft are provided to the Core Processing Area 30 by the data feed drivers.

In the embodiment of Figure 10, Data Feed 36 accepts information from “dynamic” data feeds (those real time feeds that typically change in fractions of a second), e.g. Reuters SSL, TIB/Rendezvous, etc. Data Feed 36 also accepts indirect input through intermediary interfaces. Figure 10, for example, shows a CORBA (Common Object Request Broker Architecture) interface into Data Feed Driver 36. The CORBA interface, in turn, collects various market data feeds.

Another input type is static or semi static information flows, e.g., a text file with instrument lot sizes, a database with closing prices, etc. In the embodiment of Figure 10, this input occurs by way of Instrument Information Driver 37. The instrument information driver provides a mechanism to update information from its sources if necessary. For example, a database with stock closing prices will be updated at the close of the trading session. In the preferred embodiments, updating may occur manually or automatically. Multiple drivers can also be set up to locate information about a particular instrument from different data feeds (e.g., stock pricing, options pricing for that stock, etc.)

It should be noted that the exemplary feeds described herein are used in the preferred embodiments described here, however, in other embodiments these and/or other data feeds with associated drivers, if necessary, may be used.

Also shown in Figure 10 are two Exchange Drivers 33 and 35 for Ordering Systems 40 and 41 respectively. These output drivers are responsible for sending any orders created by the Core Processing Area 30 to the ordering systems for execution, as will be explained in further detail below.

A ComplexOrder is executed in the preferred embodiments by use of queues. An input driver retrieves a ComplexOrder object from an order queue. The ordering system will have identified the algorithm used by the ComplexOrder so that the Core Processing Area may wrap the order in a corresponding AlgorithmContext object instance. (The corresponding AlgorithmContext instance is based on the algorithm name specified by the order.)

The AlgorithmContext object will first register itself with specific event interests. Event interests are those relevant to the particular algorithm and the

particular ComplexOrder. So, for example, if the order contains the event “The price of Sun over Microsoft exceeds 1.2” that specific AlgorithmContext object will register the order with an Event Interest object.

It should be noted that a complex ComplexOrder may be used, such as one that contains a multi-instrument order with multi-algorithms. In such an event, an AlgorithmContext Container object is created. This object wraps other AlgorithmContexts within it. The AlgorithmContext Container will then forward all order creation requests to its internal AlgorithmContexts. The instrument identification field for each algorithm provide the necessary identification for proper forwarding. In other embodiments, such as for example when a multi-instrument single algorithm is used, another field besides the instrument identification field may be used to identify the appropriate AlgorithmContext.

Event interests exist in this embodiment to provide a placeholder to an event. A placeholder is needed between the AlgorithmContext object and the event because the event may not exist at the time the order has been input. For example, the Sun-Microsoft price ratio event called for by the above example does not exist. Therefore, any direct call for the event by a AlgorithmContext object would be invalid. Accordingly, an Event Interest object is created instead, which will await the event.

Events may be generated internally, in the Core Processing Area, or be input by way of external sources, or both. So, for example, the Ratio event “The price of Sun over Microsoft exceeds 1.2” is generated internally, as a product of events from external sources. The external sources provide the price tick events, updated through “dynamic” data feeds, that allow the internal calculation and generation of the Ratio event. If the Ratio event reaches the proper level, (“1.2” in the above example) the AlgorithmContext is notified.

Once the events are registered for the particular AlgorithmContext instance, the actions for any particular AlgorithmContext instance will be executed when the events occur. In order to execute the actions for a particular AlgorithmContext, an ActionDispatcher object is used. This object receives requests for dispatching actions when the event occurs and places the actions on an internal queue. So, for example, an ActionDispatcher object might receive an event, e.g. “The price of Sun over Microsoft

exceeds 1.2” -- and place the corresponding action, e.g. “Buy 10,000 shares of Sun; sell 15,000 shares of Microsoft,” – on the internal queue.

Once the action is placed on the internal queue, those actions requiring orders, e.g. “Buy 10,000 shares of Sun; sell 15,000 shares of Microsoft to the ordering system,” send the orders to the ordering system by way of an ActionDispatcher. The order may be sent to any specific ordering system in the various preferred embodiments, and the specific ordering system that the order is sent to will depend upon the interface configuration.

After the ordering system executes the orders, it will send the execution confirmation to the Input driver. If, instead of execution, the order has been cancelled or corrected by the ordering system, the ordering system will send the appropriate message to the Input driver.

Isolating the execution of the actions by means of the ActionDispatcher helps prevent more than one action from the same ComplexOrder executing simultaneously, which is important to accurate execution. For example, if actions did execute simultaneously, there might be an out-of-order result fed back to the ComplexOrder, leading to incorrect execution of the order.

Once the order has been executed by the ordering system, an Order message is fed back to the Exchange driver. The Exchange driver will then create an ExchangeEvent object, which will be disseminated through the Core Processing Area. In an especially preferred embodiment, the ExchangeEvent object is sent to a market gateway component, which creates a SysAction object, to be used internally to update an associated AlgorithmContext object. Of course, it would be possible, in some embodiments, to update the AlgorithmContext object directly. However, the preferred embodiments use of an indirect transfer for the order message helps ensure accuracy in the ordering mechanism by preventing interference with any possible action execution.

The SysAction object is used internally to update the AlgorithmContext object by way of the ActionDispatcher. The ActionDispatcher will also provide any other Event interests with the SysAction object, provided they had registered an interest with that particular AlgorithmContext. When the SysAction object informs the AlgorithmContext object the Actions have been completed (which may include notification of execution, failure to execute, etc.), the AlgorithmContext fires a