US006529217B1

(12) **United States Patent**
Maguire, III et al.

(10) **Patent No.: US 6,529,217 B1**
(45) **Date of Patent: Mar. 4, 2003**

(54) **SYSTEM AND METHOD FOR GRAPHICALLY DISPLAYING A SET OF DATA FIELDS**

(75) Inventors: **Justin M. Maguire, III**, Seattle, WA (US); **David L. Stearns**, Seattle, WA (US); **Jeanell D. Sullivan**, Carnation, WA (US); **Andrew J. Verprauskus**, Seattle, WA (US); **Wenli Zhu**, Redmond, WA (US)

(73) Assignee: **Microsoft Corporation**, Redmond, WA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/333,737**

(22) Filed: **Jun. 15, 1999**

(51) **Int. Cl.**[7] **G09G 5/00**
(52) **U.S. Cl.** **345/769**; 345/765; 345/440
(58) **Field of Search** 345/769, 765, 345/835, 440, 866

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,461,708 A * 10/1995 Kahn 345/440
5,535,324 A * 7/1996 Alvarez et al. 345/440
5,581,677 A * 12/1996 Myers et al. 345/440
5,588,108 A * 12/1996 Kumar et al. 345/765
5,619,631 A * 4/1997 Schott 345/440
5,768,578 A * 6/1998 Kirk et al. 707/100
5,894,311 A * 4/1999 Jackson 345/440
6,075,530 A * 6/2000 Lucas et al. 345/804
6,188,403 B1 * 2/2001 Sacerdoti et al. 345/440
6,233,719 B1 * 5/2001 Hardikar et al. 345/866
6,333,748 B1 * 12/2001 Takiguchi et al. 345/589

* cited by examiner

Primary Examiner—Sy D. Luu
(74) *Attorney, Agent, or Firm*—Mark R. Hennings; Merchant & Gould

(57) **ABSTRACT**

A method for graphically displaying a set of data fields includes creating a graphical display of a set of data fields through the use of icons and drop areas. To graphically display the data fields, a user first selects a range of data points, grouped into data fields, to be included in the graphical display. A list of icons corresponding to each of the data fields is then generated. A graph template is displayed, comprising a set of drop areas and a field list. The icons are displayed within the field list. Each drop area displays a watermark and may receive a number of icons. A user may drag and drop an icon from the field list into any one of the drop areas, which causes the data field associated with that icon to be graphically displayed in a manner dependent on the drop area.

22 Claims, 10 Drawing Sheets

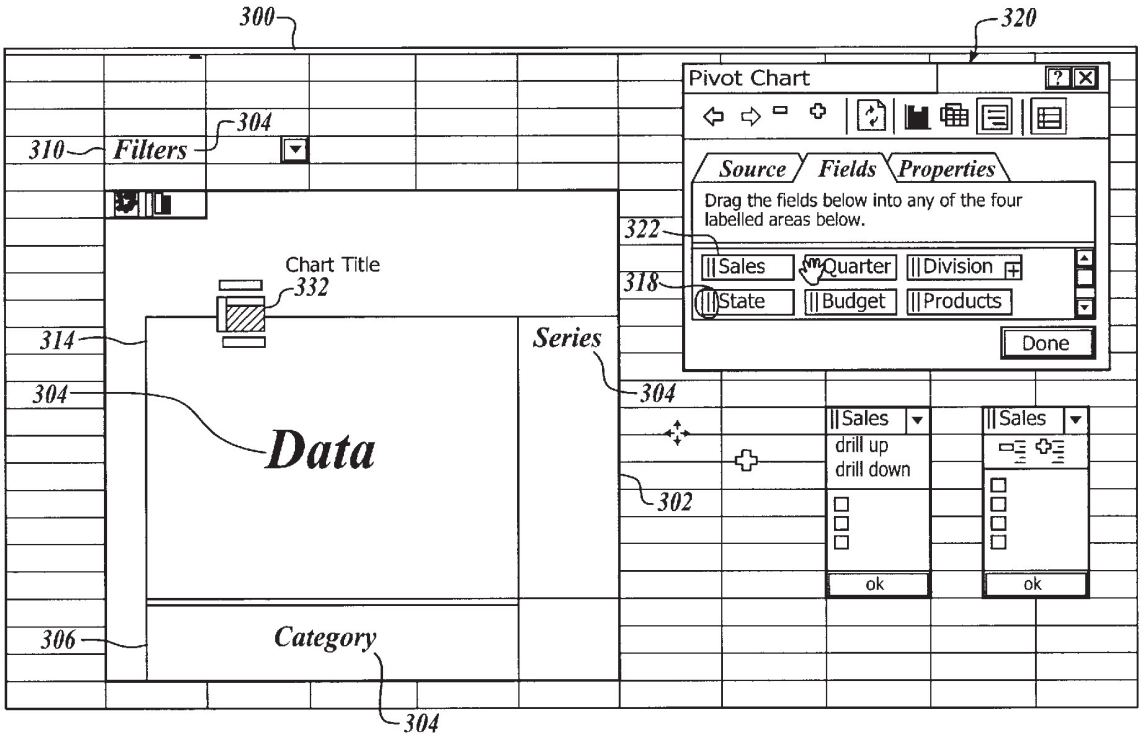


Tableau EX1055
IPR2024-01388
U.S. Patent No. 9,712,595

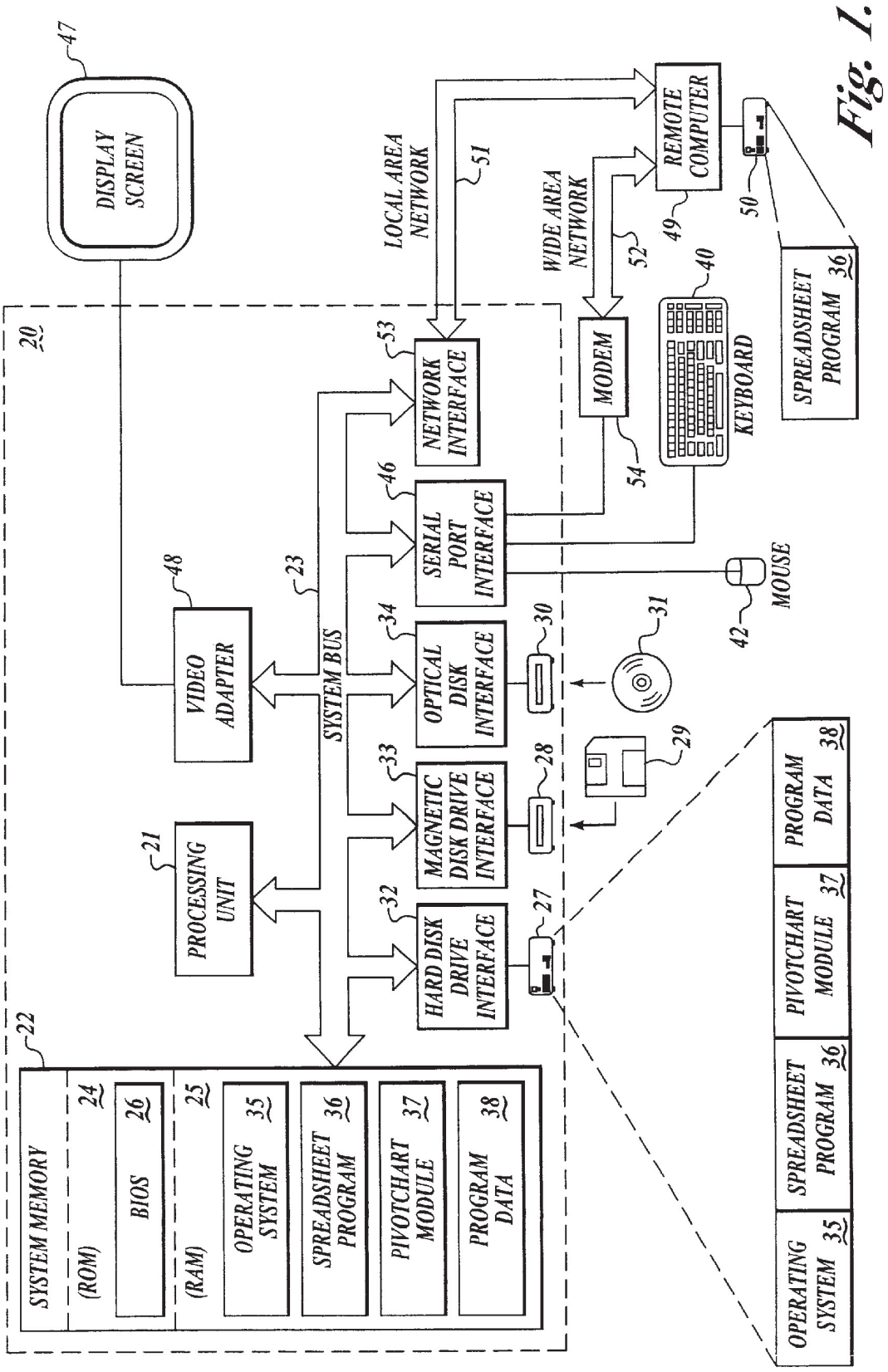
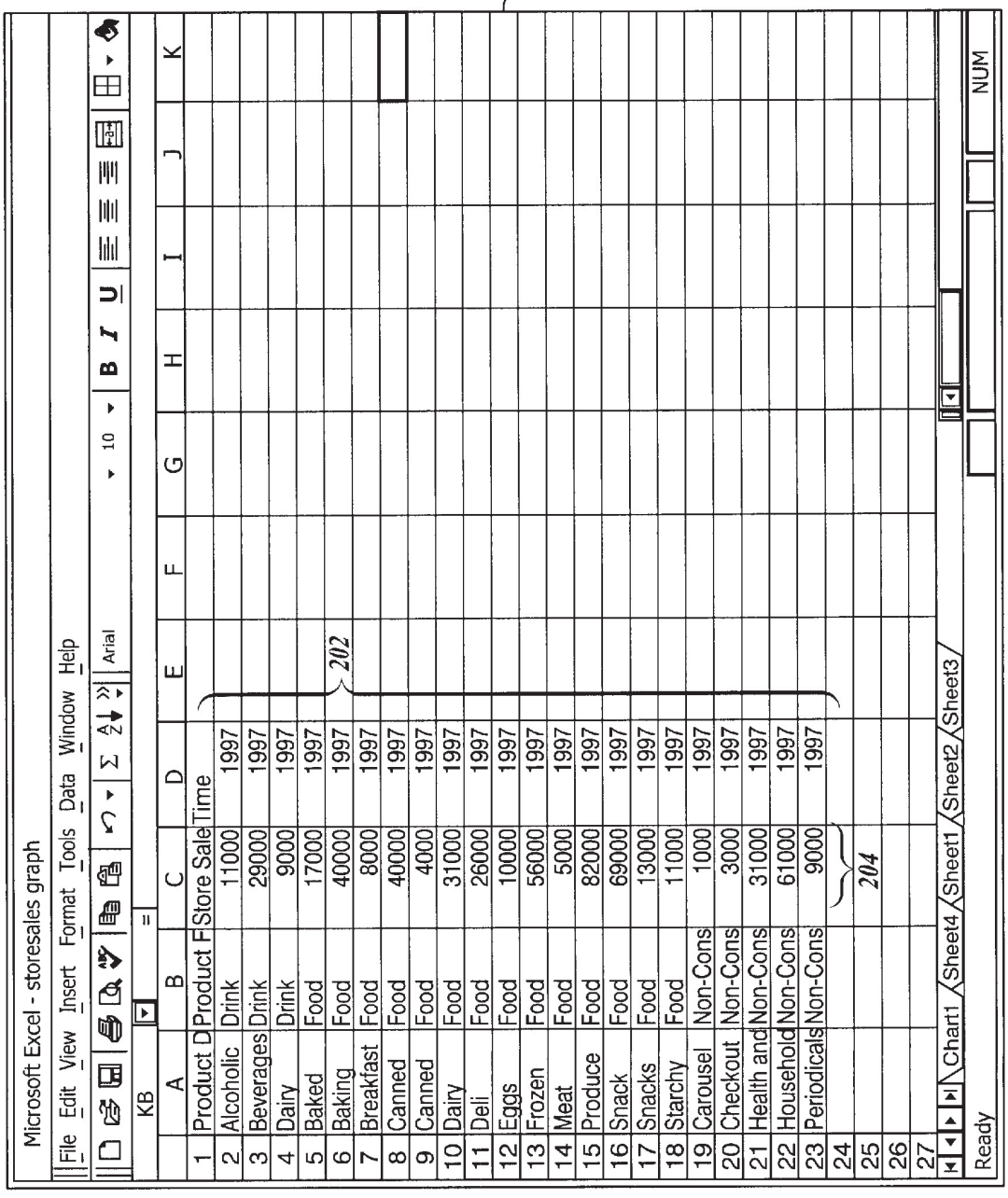

DISPLAY SCREEN
47
20
LOCAL AREA NETWORK
51
WIDE AREA NETWORK
REMOTE COMPUTER
49
50
52
40
NETWORK INTERFACE
53
MODEM
54
KEYBOARD
SPREADSHEET PROGRAM
36
SERIAL PORT INTERFACE
46
48
VIDEO ADAPTER
23
SYSTEM BUS
34
OPTICAL DISK INTERFACE
30
31
MOUSE
42
21
PROCESSING UNIT
33
MAGNETIC DISK DRIVE INTERFACE
28
29
32
HARD DISK DRIVE INTERFACE
27
22
SYSTEM MEMORY
(ROM)
24
BIOS
26
(RAM)
25
OPERATING SYSTEM
35
SPREADSHEET PROGRAM
36
PIVOTCHART MODULE
37
PROGRAM DATA
38

Fig. 1.



	A	B	C	D
1	Product D	Product F	Store Sale	Time
2	Alcoholic	Drink	11000	1997
3	Beverages	Drink	29000	1997
4	Dairy	Drink	9000	1997
5	Baked	Food	17000	1997
6	Baking	Food	40000	1997
7	Breakfast	Food	8000	1997
8	Canned	Food	40000	1997
9	Canned	Food	4000	1997
10	Dairy	Food	31000	1997
11	Deli	Food	26000	1997
12	Eggs	Food	10000	1997
13	Frozen	Food	56000	1997
14	Meat	Food	5000	1997
15	Produce	Food	82000	1997
16	Snack	Food	69000	1997
17	Snacks	Food	13000	1997
18	Starchy	Food	11000	1997
19	Carousel	Non-Cons	1000	1997
20	Checkout	Non-Cons	3000	1997
21	Health and	Non-Cons	31000	1997
22	Household	Non-Cons	61000	1997
23	Periodicals	Non-Cons	9000	1997
24				
25				
26				
27				

Fig. 2.

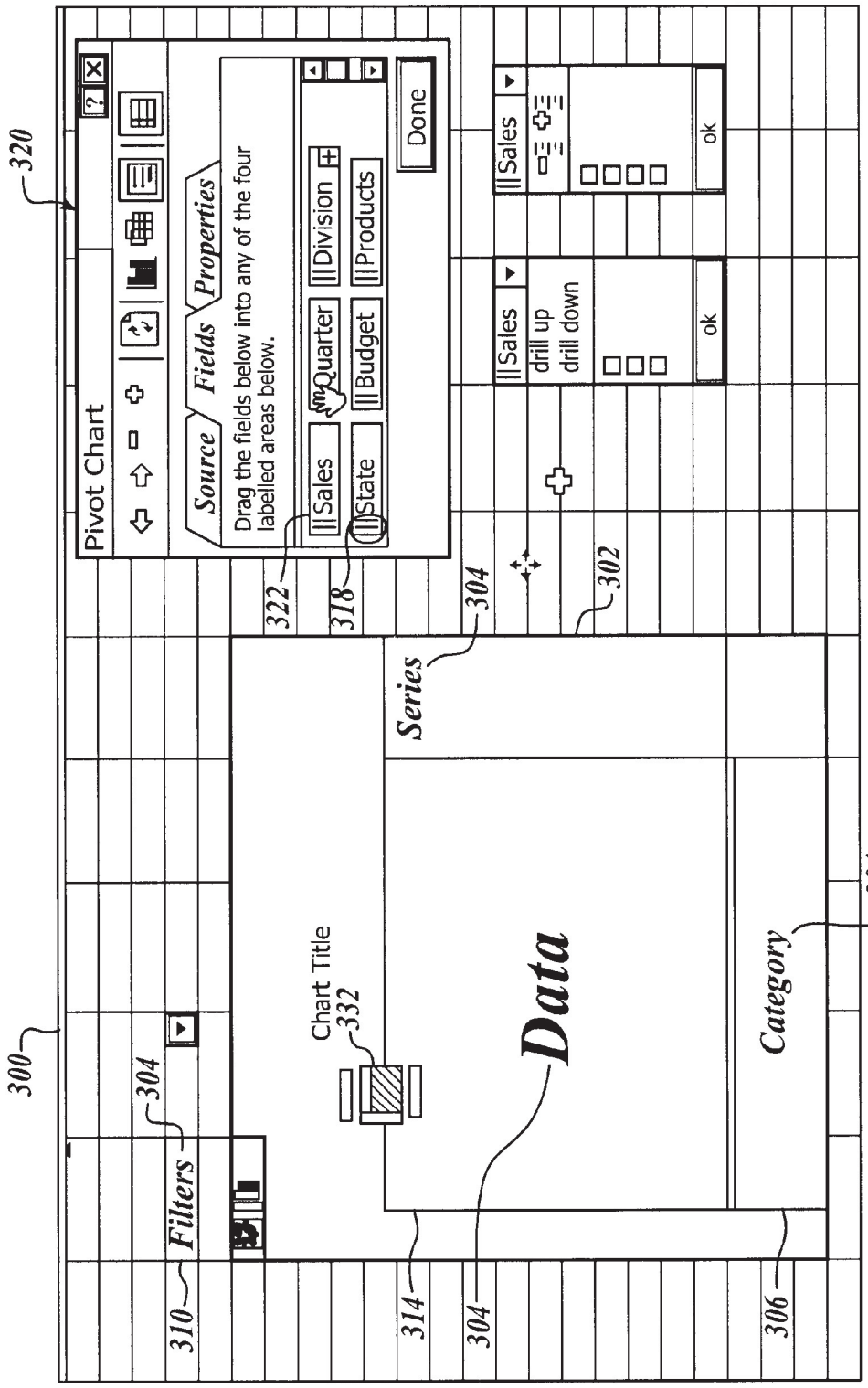

320
Pivot Chart
Source
Fields
Properties
Drag the fields below into any of the four labelled areas below.
Sales
Quarter
Division
State
Budget
Products
Done
322
318
Sales
drill up
drill down
ok
304
302
Series
300
Chart Title
332
Data
Category
Filters
310
314
306

Fig. 3.

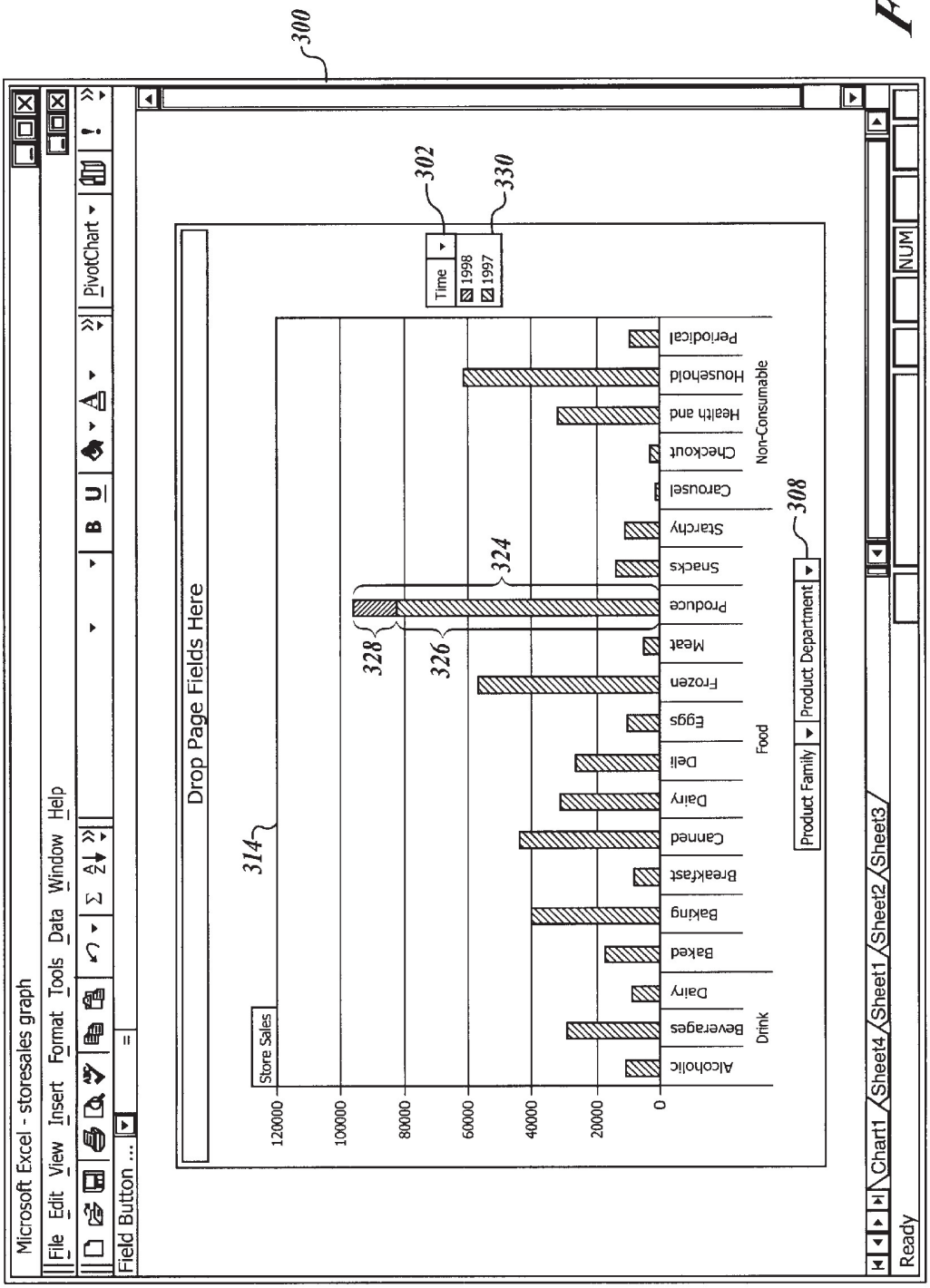

300
Microsoft Excel - storesales graph
File Edit View Insert Format Tools Data Window Help
PivotChart
Field Button ...
Drop Page Fields Here
302
330
Time
1998
1997
314
Store Sales
120000
100000
80000
60000
40000
20000
0
328
326
324
Alcoholic
Beverages
Dairy
Baked
Baking
Breakfast
Canned
Dairy
Deli
Eggs
Frozen
Meat
Produce
Snacks
Starchy
Carousel
Checkout
Health and
Household
Periodical
Drink
Food
Non-Consumable
Product Family
Product Department
308
Chart1
Sheet4
Sheet1
Sheet2
Sheet3
Ready
NUM

Fig. 3A.

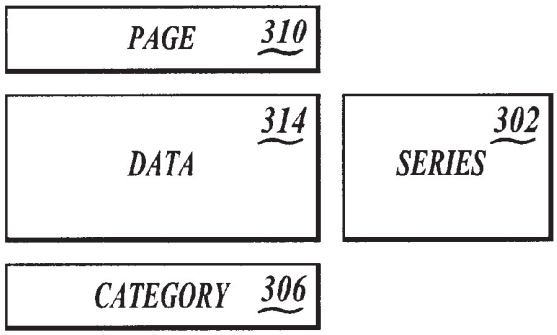


Fig. 4A.

COLUMN CHART

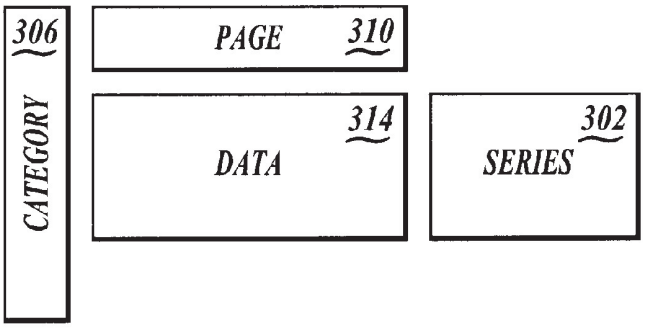


Fig. 4B.

BAR CHART

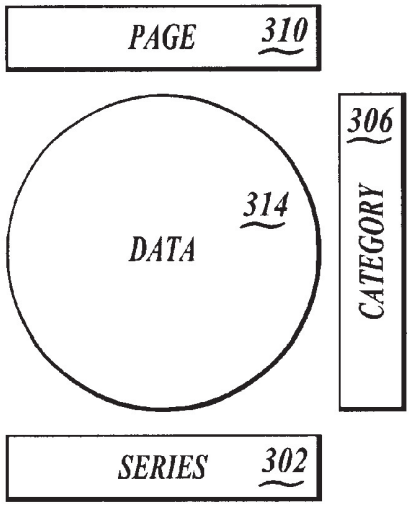


Fig. 4C.

PIE CHART

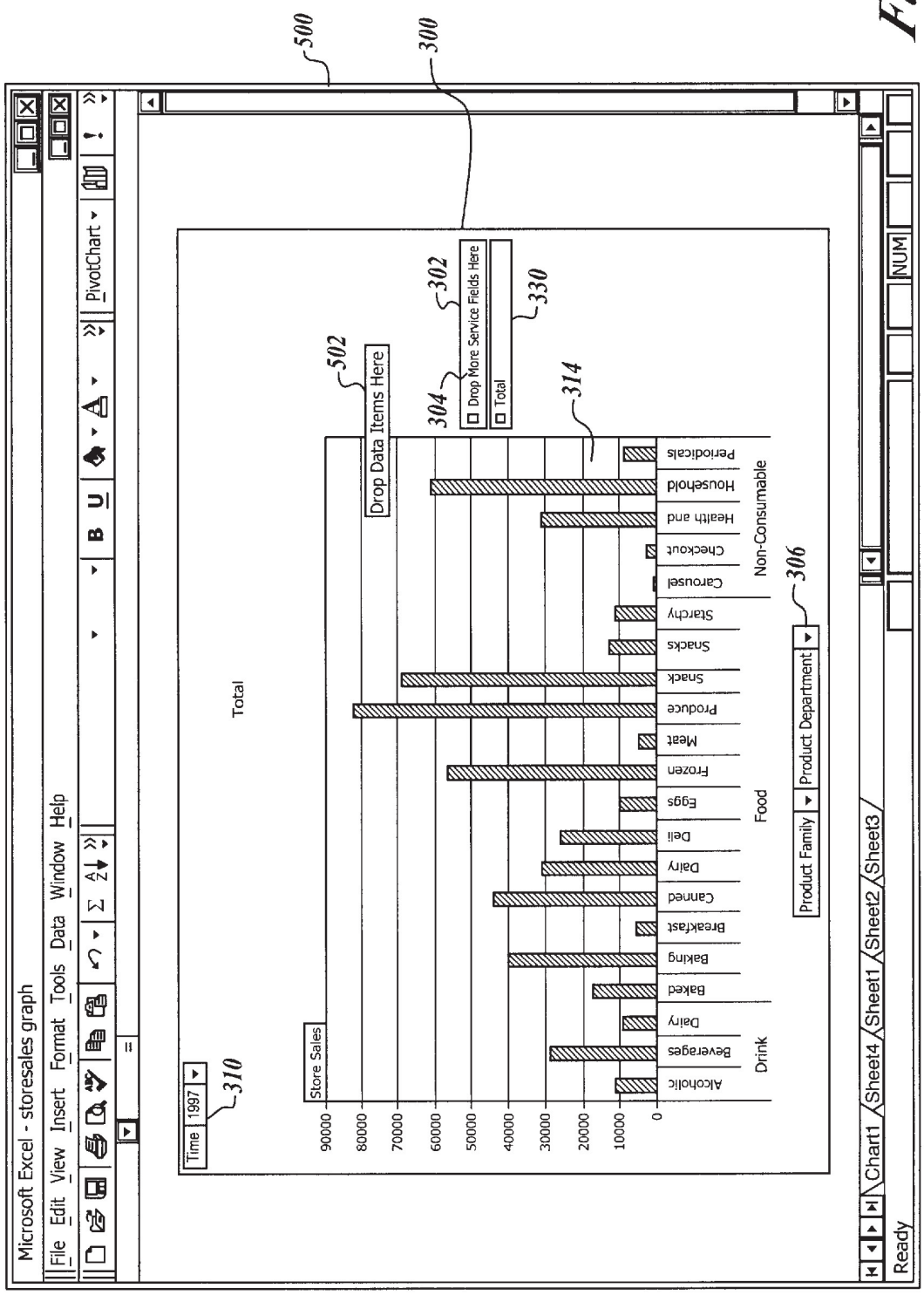

500
300
Microsoft Excel - storesales graph
File Edit View Insert Format Tools Data Window Help
PivotChart
Time 1997
310
Total
Store Sales
502
Drop Data Items Here
304
302
Drop More Service Fields Here
Total
330
314
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
Alcoholic
Beverages
Dairy
Baked
Baking
Breakfast
Canned
Dairy
Deli
Eggs
Frozen
Meat
Produce
Snack
Snacks
Starchy
Carousel
Checkout
Health and
Household
Periodicals
Drink
Food
Non-Consumable
Product Family
Product Department
306
Chart1 Sheet4 Sheet1 Sheet2 Sheet3
Ready
NUM

Fig. 5.

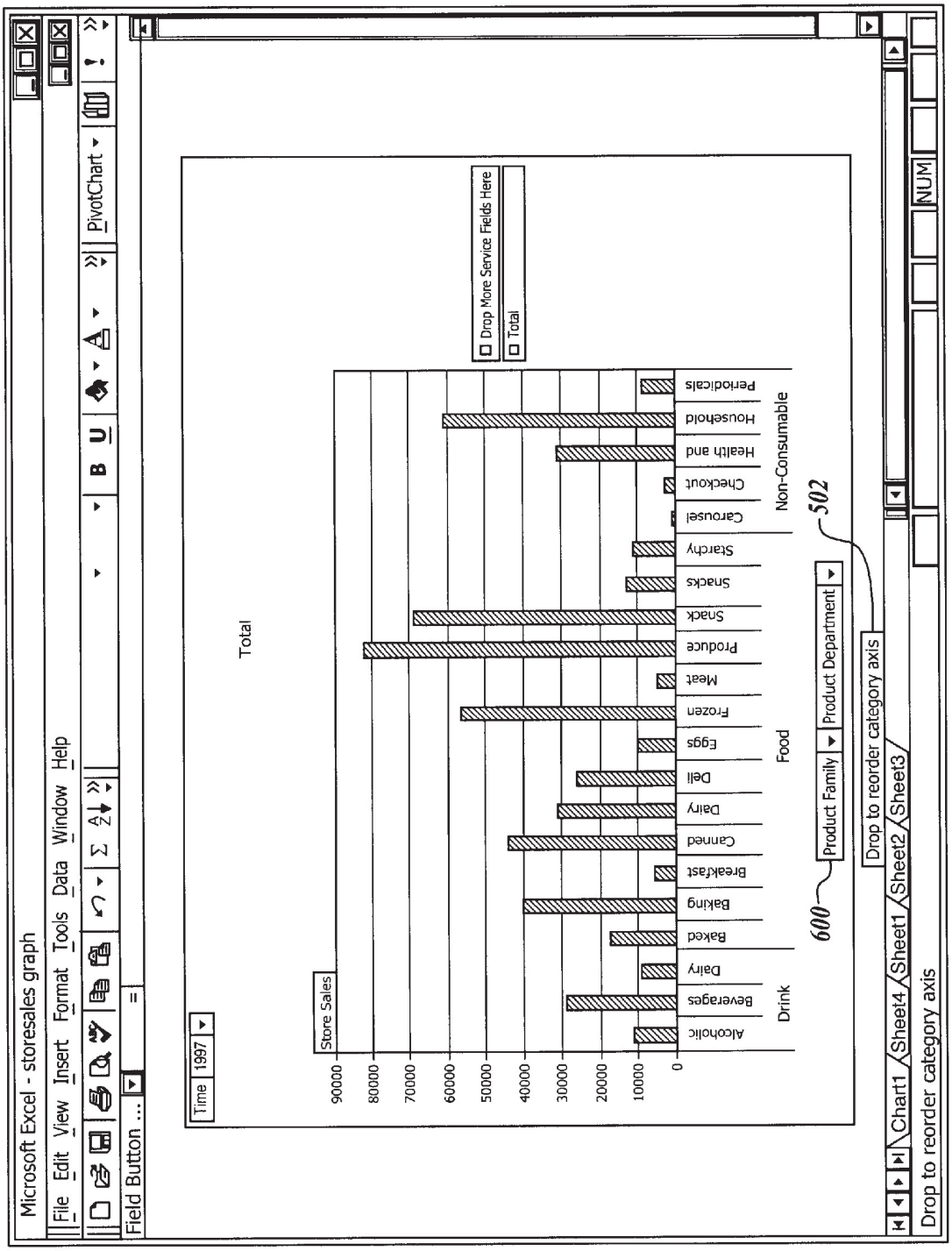

Microsoft Excel - storesales graph
File Edit View Insert Format Tools Data Window Help
PivotChart
Field Button ...
Time 1997
Total
Store Sales
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
Drop More Service Fields Here
Total
Alcoholic
Beverages
Dairy
Baked
Baking
Breakfast
Canned
Dairy
Deli
Eggs
Frozen
Meat
Produce
Snack
Snacks
Starchy
Carousel
Checkout
Health and
Household
Periodicals
Drink
Food
Non-Consumable
600
Product Family
Product Department
502
Drop to reorder category axis
Chart1 Sheet4 Sheet1 Sheet2 Sheet3
Drop to reorder category axis
NUM

Fig. 6.

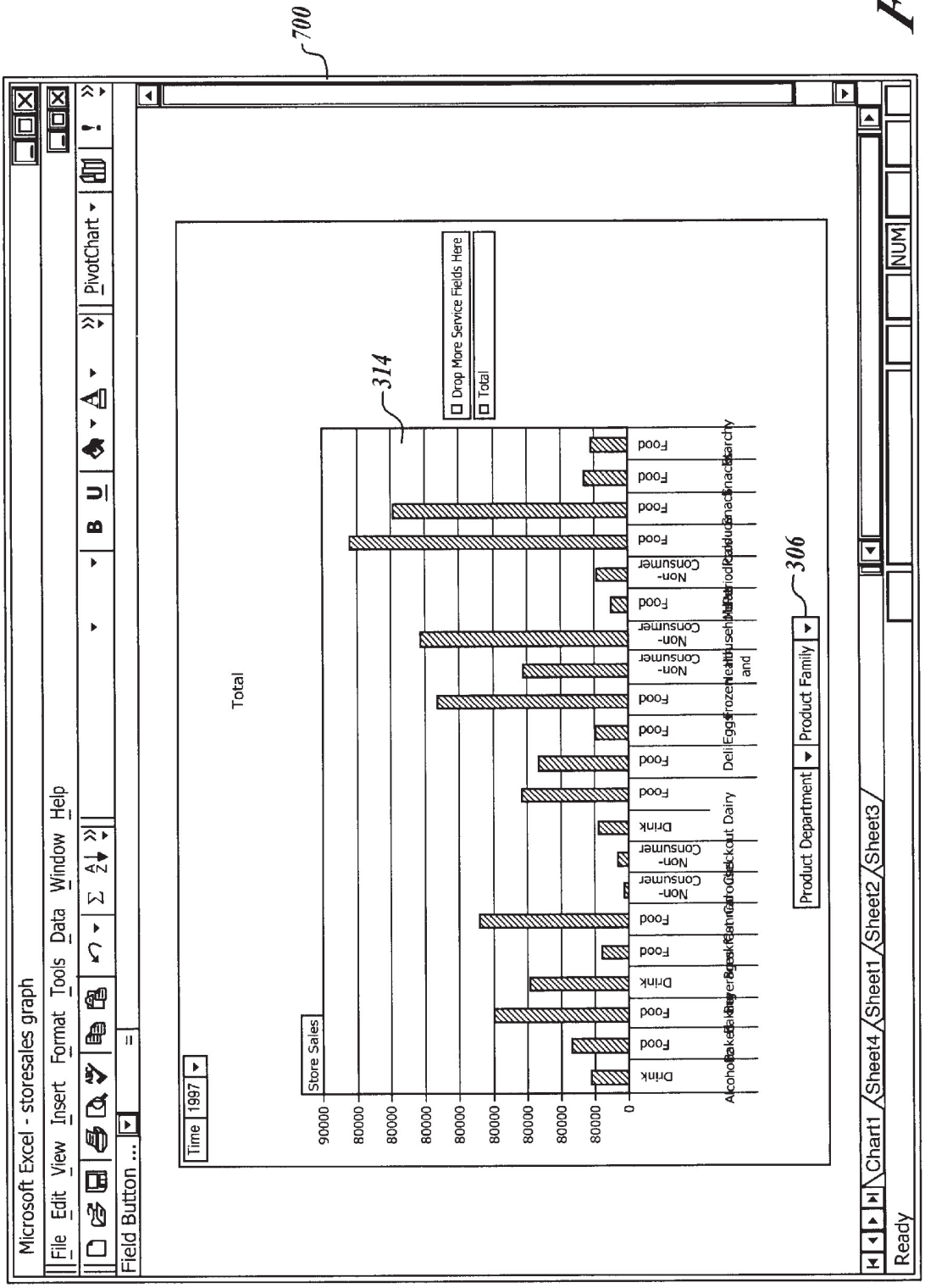

700
Microsoft Excel - storesales graph
File Edit View Insert Format Tools Data Window Help
PivotChart
Field Button ...
Time 1997
Total
Store Sales
314
Drop More Service Fields Here
Total
306
Product Department
Product Family
Ready
Chart1 Sheet4 Sheet1 Sheet2 Sheet3
NUM

Fig. 7.

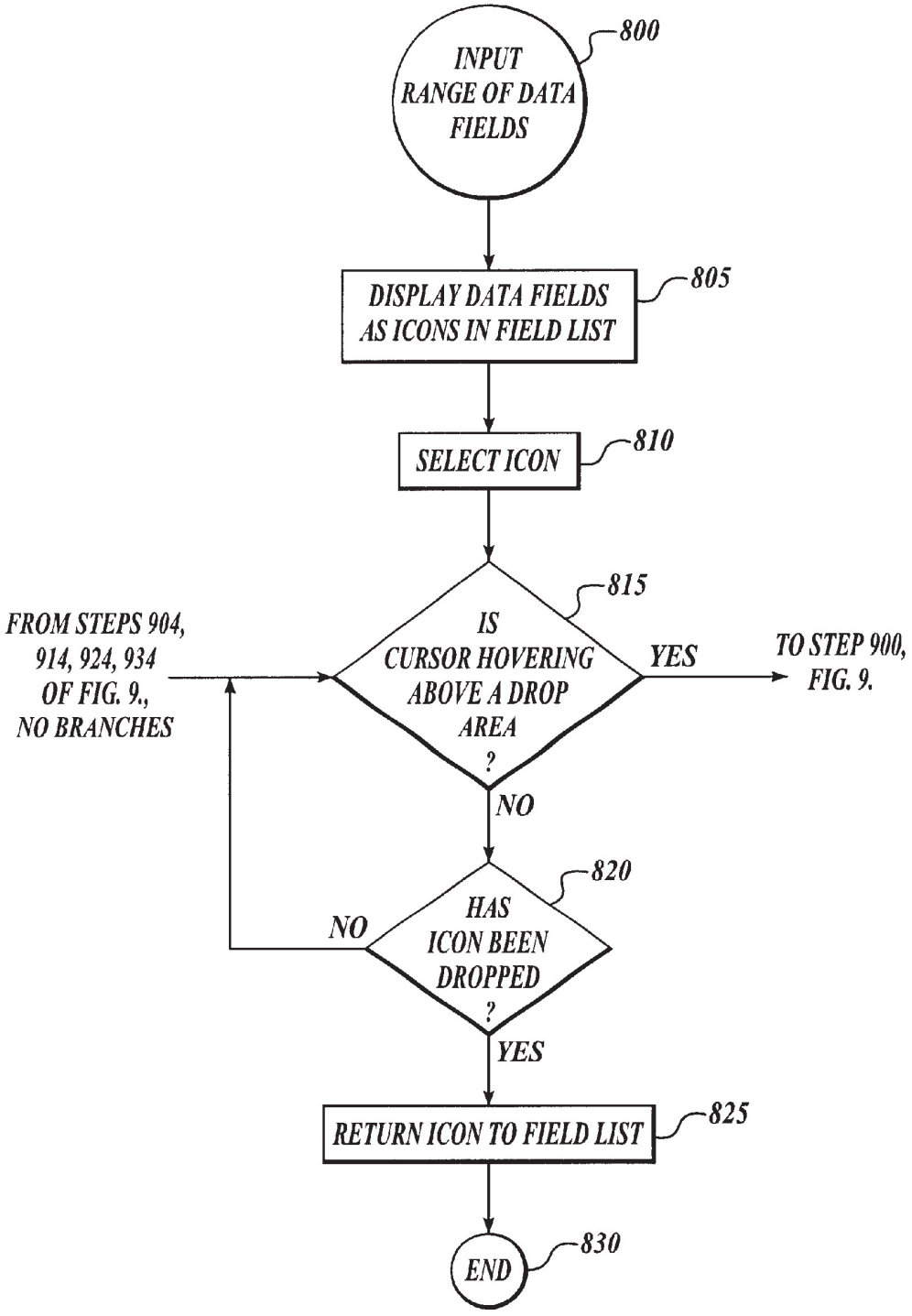

INPUT RANGE OF DATA FIELDS
800
DISPLAY DATA FIELDS AS ICONS IN FIELD LIST
805
SELECT ICON
810
IS CURSOR HOVERING ABOVE A DROP AREA ?
815
YES
TO STEP 900, FIG. 9.
FROM STEPS 904, 914, 924, 934 OF FIG. 9., NO BRANCHES
NO
HAS ICON BEEN DROPPED ?
820
NO
YES
RETURN ICON TO FIELD LIST
825
END
830

Fig. 8.

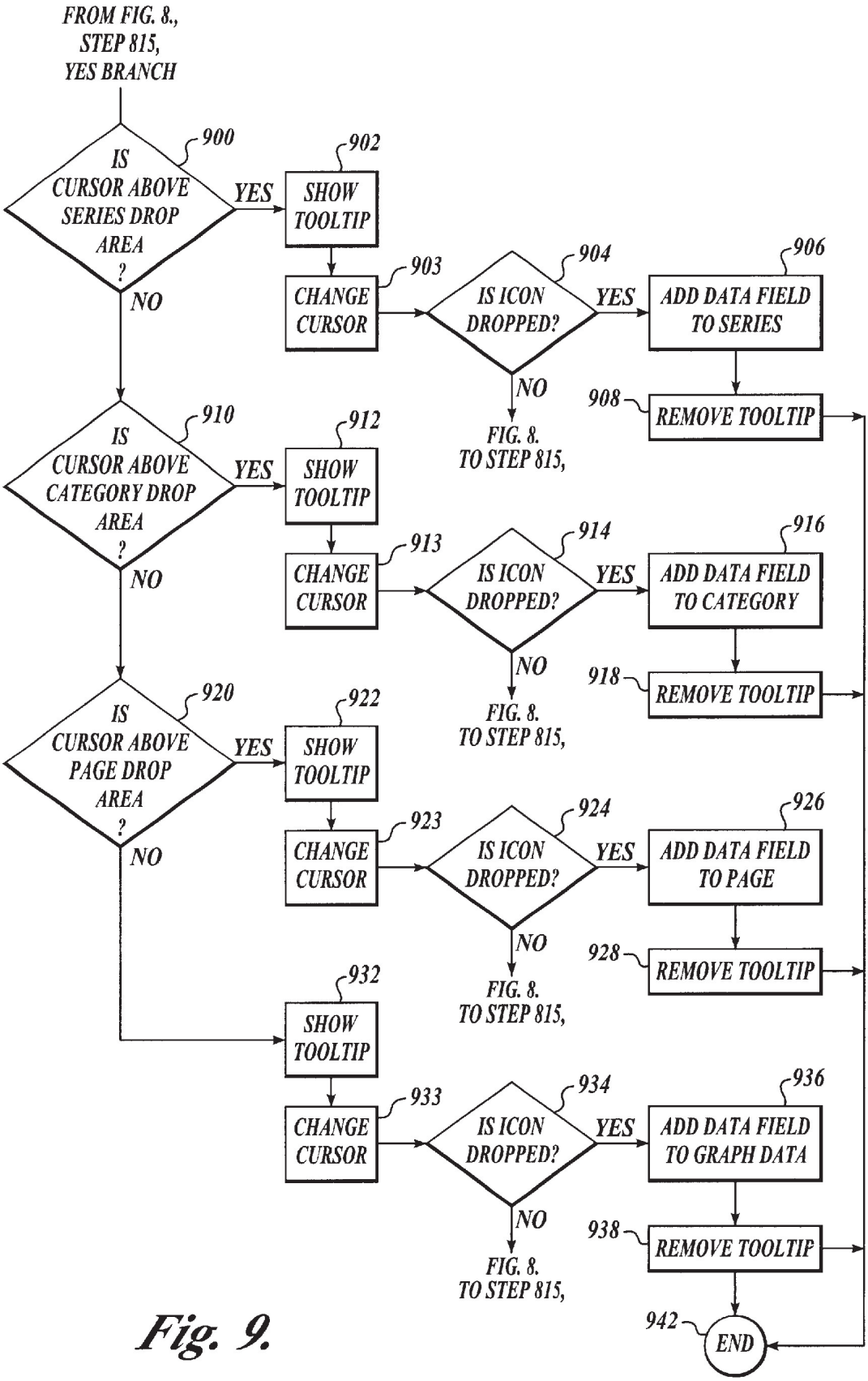

FROM FIG. 8., STEP 815, YES BRANCH
900
IS CURSOR ABOVE SERIES DROP AREA ?
YES
902
SHOW TOOLTIP
NO
903
CHANGE CURSOR
904
IS ICON DROPPED?
YES
906
ADD DATA FIELD TO SERIES
NO
908
REMOVE TOOLTIP
FIG. 8. TO STEP 815,
910
IS CURSOR ABOVE CATEGORY DROP AREA ?
YES
912
SHOW TOOLTIP
NO
913
CHANGE CURSOR
914
IS ICON DROPPED?
YES
916
ADD DATA FIELD TO CATEGORY
NO
918
REMOVE TOOLTIP
FIG. 8. TO STEP 815,
920
IS CURSOR ABOVE PAGE DROP AREA ?
YES
922
SHOW TOOLTIP
NO
923
CHANGE CURSOR
924
IS ICON DROPPED?
YES
926
ADD DATA FIELD TO PAGE
NO
928
REMOVE TOOLTIP
FIG. 8. TO STEP 815,
932
SHOW TOOLTIP
933
CHANGE CURSOR
934
IS ICON DROPPED?
YES
936
ADD DATA FIELD TO GRAPH DATA
NO
938
REMOVE TOOLTIP
FIG. 8. TO STEP 815,
942
END

Fig. 9.

SYSTEM AND METHOD FOR GRAPHICALLY DISPLAYING A SET OF DATA FIELDS

TECHNICAL FIELD

The present invention relates to graphically displaying data fields, and is more particularly directed to creating a graph through the use of an improved user interface containing icons representing data fields, drop areas, and enhanced user feedback.

BACKGROUND OF THE INVENTION

Spreadsheet programs are a useful tool in performing computational tasks such as keeping household budgets, work schedules, tracking bank accounts, maintaining inventories, and so on. As the use of personal computers within the home and business environments becomes more common, so too does the use of the spreadsheet program. The versatility of spreadsheet applications and the ease with which they are adapted to various tasks has resulted in their widespread use. With ongoing advances in the speed and capabilities of personal computers, enhanced features have been developed for spreadsheet programs.

Most spreadsheet and data management programs allow a user to create a graph of data points organized into data fields. Typically, a table displaying the interrelationships between various data fields must first be created. Next, the chart or graph is created, using this table as its basis. This necessitates first creating the table from the spreadsheet data, and then mapping the table to the chart. This method adds an additional level of abstraction to the chart creation process, leading to both increased modeling time on the part of the user and additional user confusion as the intermediate step is confronted. Thus, there is a need for a method of graphically displaying data fields that minimizes user input time and confusion.

Further, the traditional method for creating a chart often leads to graphing irregularities as the underlying data is modified, in part due to the additional level of abstraction between the data and the chart. Oftentimes, this renders the resulting chart unreadable. Therefore, there is also a need for a method of creating a graph from that allows a user to directly manipulate data fields on the graph itself, rather than relying on abstracting the data from an underlying table.

Most data management and manipulation programs give minimal feedback when a user is creating a graph of a set of data fields. This often leads to confusion on the part of a user as to the consequences of his actions, and may further lead to user error in graphing data fields. Thus, there is a further need for enhanced user feedback when creating a graphical display of data fields.

SUMMARY OF THE INVENTION

The invention is a system and a method for graphically displaying data by creating a graph with the use of a graphical user interface (GUI) containing icons representing data fields, drop areas displayed on the surface of a graph template, and enhanced user feedback. The invention allows a user to drag and drop data fields within a graph template containing several drop areas. A user may drag icons indicating various fields, or categories of data, directly onto these drop areas. As data fields are dropped on the various drop areas, the data is automatically charted on the graphical display. Further, as data fields are dropped in series or category drop areas, the axes of the graph template are automatically updated to reflect the new series or category fields. These drop areas change size and position depending on the type of graph being constructed. This keeps the drop area next to the axis on which the data field's items would be placed. Additionally, the graph template may be changed at any time during or after the graph creation process, thus allowing a user to alter the graphical display at will.

To enhance user feedback, text watermarks are visible within the drop areas. These watermarks indicate what types of fields should be dropped in each drop zone. For example, the series drop zone watermark reads: "Drop More Series Fields Here." This allows a user to easily and quickly comprehend the purpose of each drop area, as well as what effect will occur when dropping a specific data field into a specific drop area.

To further enhance user feedback, a variety of cursors are employed. The cursor changes shape depending on its current position in the graph template. As the cursor passes across a drop area, it changes shape to resemble the layout of the graph template. Additionally, the portion of the template corresponding to the drop area over which the cursor hovers is shaded. Thus, a user will know which drop area is underneath the cursor simply by looking at the cursor shape and coloring.

Finally, a user of the invention may easily reorder fields within an axis. The user simply clicks on the field he desires to move and drags the field to its new position. As a user interface enhancement, the cursor changes to an I-bar shape as the field is moved, thus showing a user exactly where the field will be placed if dropped. This allows a user to easily determine precise field placement when reordering fields along an axis.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram of a personal computer that provides an exemplary operating environment for an exemplary embodiment of the present invention.

FIG. **2** is a screen display illustrating a range of data points and data fields in accordance with an exemplary embodiment of the present invention.

FIG. **3** is a screen display illustrating a graph template in accordance with an exemplary embodiment of the present invention.

FIG. **3A** is a screen display illustrating a graphical display of a data field in accordance with an exemplary embodiment of the present invention.

FIG. **4A** is a diagram showing the layout of drop areas for a column column graph template in accordance with an exemplary embodiment of the present invention.

FIG. **4B** is a diagram showing the layout of drop areas for a bar column graph template in accordance with an exemplary embodiment of the present invention.

FIG. **4C** is a diagram showing the layout of drop areas for a pie column graph template in accordance with an exemplary embodiment of the present invention.

FIG. **5** is a screen display illustrating a graphical display of a data field in accordance with an exemplary embodiment of the present invention.

FIG. **6** is a screen display illustrating the initial steps in reordering data along a graph axis in accordance with an exemplary embodiment of the present invention.

FIG. **7** is a screen display illustrating a graphical display of a data field where the data fields have been reordered along the category axis in accordance with an exemplary embodiment of the present invention.

FIG. **8** is a flowchart illustrating a method for creating a graphical display of data fields in accordance with an exemplary embodiment of the present invention.

FIG. **9** is a continuation of the flowchart of FIG. **8**, further illustrating a method for creating a graphical display of data fields in accordance with an exemplary embodiment of the present invention.

DETAILED DESCRIPTION

The present invention is directed to a system and method for graphically displaying a set of data fields. In an exemplary embodiment, the invention is incorporated into the Microsoft EXCEL program, which is one of the applications in the Microsoft OFFICE application suite, as a PivotChart module. EXCEL and OFFICE are produced and distributed by Microsoft Corporation of Redmond, Wash. Briefly described, Microsoft OFFICE is a suite of application programs commonly used by both home and business users, and EXCEL is a spreadsheet and data manipulation program. In general, spreadsheet programs allow a user to enter and manipulate data, as well as display data in a tabular format. It is often desirable to graphically display this data. A PivotChart module allows a user to graphically display and manipulate data. The capabilities of the present invention, specifically the graphical display capabilities, will be described in greater detail herein below with respect to FIGS. **1–9**, wherein like elements are represented by like numerals throughout the several figures.

Now turning to FIG. **1**, an exemplary operating environment in accordance with the exemplary embodiment of the present invention is now described.

Exemplary Operating Environment

FIG. **1** and the following discussion are intended to provide a brief, general description of a suitable computing environment in which the invention may be implemented. While the invention will be described in the general context of an application program that runs on an operating system in conjunction with a personal computer, those skilled in the art will recognize that the invention also may be implemented in combination with other program modules. Generally, program modules include routines, programs, components, data structures, and so on that perform particular tasks or implement particular abstract data types. Moreover, those skilled in the art will appreciate that the invention may be practiced with other computer system configurations, including hand-held devices, multiprocessor systems, microprocessor-based or programmable consumer electronics, minicomputers, mainframe computers, and the like. The invention may also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications network. In a distributed computing environment, program modules may be located in both local and remote memory storage devices.

With reference to FIG. **1**, an exemplary system for implementing the invention includes a conventional personal computer **20**, including a processing unit **21**, a system memory **22**, and a system bus **23** that couples the system memory to the processing unit **21**. The system memory **22** includes read only memory (ROM) **24** and random access memory (RAM) **25**. A basic input/output system **26** (BIOS), containing the basic routines that help to transfer information between elements within the personal computer **20**, such as during start-up, is stored in ROM **24**. The personal computer **20** further includes a hard disk drive **27**, a magnetic disk drive **28**, e.g., to read from or write to a removable disk **29**, and an optical disk drive **30**, e.g., for reading a CD-ROM disk **31** or to read from or write to other optical media. The hard disk drive **27**, magnetic disk drive **28**, and optical disk drive **30** are connected to the system bus **23** by a hard disk drive interface **32**, a magnetic disk drive interface **33**, and an optical drive interface **34**, respectively. The drives and their associated computer-readable media provide nonvolatile storage for the personal computer **20**. Although the description of computer-readable media above refers to a hard disk, a removable magnetic disk and a CD-ROM disk, it should be appreciated by those skilled in the art that other types of media which are readable by a computer, such as magnetic cassettes, flash memory cards, digital video disks, Bernoulli cartridges, and the like, may also be used in the exemplary operating environment.

A number of program modules may be stored in the drives and RAM **25**, including an operating system **35**, one or more application programs such as a database program **36**, a PivotChart module **37**, and program data **38**. A user may enter commands and information into the personal computer **20** through conventional input devices, including a keyboard **40** and pointing device, such as a mouse **42**. Other input devices (not shown) may include a pen, touch-operated device, microphone, joystick, game pad, satellite dish, scanner, or the like. These and other input devices are often connected to the processing unit **21** through a serial port interface **46** that is coupled to the system bus, but may be connected by other interfaces, such as a game port or a universal serial bus (USB). A display screen **47** or other type of display device is also connected to the system bus **23** via an interface, such as a video adapter **48**. In addition to the display screen **47**, personal computers typically include other peripheral output devices (not shown), such as speakers or printers.

The personal computer **20** may operate in a networked environment using logical connections to one or more remote computers, such as a remote computer **49**. The remote computer **49** may be a server, a router, a peer device or other common network node, and typically includes many or all of the elements described relative to the personal computer **20**, although only a memory storage device **50** has been illustrated in FIG. **1**. The logical connections depicted in FIG. **1** include a local area network (LAN) **51** and a wide area network (WAN) **52**. Such networking environments are commonplace in offices, enterprise-wide computer networks, intranets and the Internet.

When used in a LAN networking environment, the personal computer **20** is connected to the LAN **51** through a network interface **53**. When used in a WAN networking environment, the personal computer **20** typically includes a modem **54** or other means for establishing communications over the WAN **52**, such as the Internet. The modem **54**, which may be internal or external, is connected to the system bus **23** via the serial port interface **46**. In a networked environment, application programs depicted relative to the personal computer **20**, or portions thereof, may be stored in the remote memory storage device. It will be appreciated that the network connections shown are exemplary and other means of establishing a communications link between the computers may be used.

Exemplary Method for Graphically Displaying a Set of Data Fields

FIGS. **2** through **7** illustrate screen displays that depict a process by which a user may graphically display data fields comprised of data points. In an exemplary embodiment, these data fields may be represented by rows or columns in a chart.

FIG. **2** depicts a portion of a typical spreadsheet. The spreadsheetwindow **200** contains multiple data points **204**.

These data points **204** are organized into data fields **202**, such as the "Time" data field, which occupies column D of the spreadsheetwindow **200**. A user of an exemplary embodiment may select the range of data fields **202** that he desires to graphically display. Typically, this is done by highlighting or otherwise selecting the data fields **202** through the use of an input device such as a mouse **42**.

Once a range of data fields **202** are selected for graphical display, an exemplary embodiment can display a graph template. Turning now to FIG. **3**, an example of a graph template **300** is shown. The graph template **300** contains a series drop area **302**, a category drop area **306**, a page drop area **310**, a data drop area **314**, and a field list **320**. Each of these elements will be discussed in turn.

The field list **320** contains a list of icons **322**. Each icon corresponds to a data field **202**. In an exemplary embodiment, a user may move an icon **322** and place, or "drop", it in the series drop area **302**, the category drop area **306**, the page drop area **310**, or the data drop area **314**. Dropping an icon **322** on any other portion of the graph template **300** results in the icon being returned to the field list **320**.

A user may manipulate an icon **322** through the use of an input device, such as a mouse **42**. Typically, a user performs a "drag and drop" operation by positioning the cursor **332** over the icon **322** that a user wishes to move, depressing the mouse **42** button, and moving the mouse while the mouse button is depressed. The icon **322** is dropped by releasing the mouse **42** button when the icon is positioned over the desired drop area. It will be apparent to those skilled in the art that icons may also be manipulated through the use of a keyboard **40**, joystick, trackball, light pen, or another similar input device. This list is intended as a means of illustration rather than limitation. Other means for manipulating icons **322** may be used without departing from the spirit or scope of this description or the following claims.

Each icon **322** displayed in the field list **320** further contains an icon drop indicator **318**. In an exemplary embodiment, the icon drop indicator **318** may appear as a set of parallel bars located in the left hand corner of the icon **322**. If the icon drop indicator **318** is present, then the icon **322** may be dragged and dropped into one of the drop areas on the graph template **300**. If an icon **322** has already been dropped in one of the drop areas, then the icon drop indicator **318** will not be present. Thus, the icon drop indicator **318** enhances the user feedback in an exemplary embodiment by indicating to a user what icons **322** have already been dropped in data fields, and which icons are still available for use.

In an exemplary embodiment, a graph template **300** has four drop areas: the series drop area **302**; the category drop area **306**; the page drop area **310**; and the data drop area **314**. As an icon **322** is dropped into one of the drop areas, the data field **202** and its attendant data points **204** are added to the graph template **300**. This results in either creating or modifying a graphical display of a data field.

Dropping an icon **322** in the category drop area **306** of the graph template **300** of an exemplary embodiment places the data field **202** along the x-axis of the graph template. For example, placing the icon **322** corresponding to the Product Department data field **202** displayed in column A of FIG. **2** in the category drop area **306** of the graph template **300** would result in graphically displaying every data point **204** contained in column A along the x-axis of the graph template.

Dropping an icon **322** in the page drop area **310** allows a user of an exemplary embodiment to filter data shown on the graph template **300** by the data field **202** corresponding to the icon placed in the page drop area. A user of an exemplary embodiment may then filter the data displayed on a fully completed graph by selecting entries corresponding to the data points **204** of the data field **202** present in the page drop area. Turning briefly back to FIG. **2**, an example will be provided. FIG. **2** displays a data field **202** in column D labeled "Time." Presuming that the Time data field has two possible entries, 1997 and 1998, a user of an exemplary embodiment may desire to see only the sales information corresponding to a particular year. If a user desires to filter data in this manner, the user may drop the icon **322** corresponding to the Time data field **202** in the page drop area **310**. A user may then be presented with the option to view a data graph on a graph template **300** corresponding only to 1997 sales, 1998 sales, or to the sales from both years. Essentially, this creates separate "pages" on the graph template **300**, each with a different set of data corresponding to the selected entry of the data field **202** and the page drop area **310**.

Icons **322** placed in the data drop area **314** will be graphically displayed in the data portion of a completed graph **500**. The data drop area **314** serves to receive icons **322** corresponding to data fields **202** that a user of an exemplary embodiment desires to graphically display. An exemplary graph will be discussed with respect to FIG. **5**.

The graph template **300** further contains a series drop area **302**. As icons **322** are dropped into the series drop area **302**, data fields **202** graphically displayed in the data drop area **314** are subdivided according to the constituent data points **204** of the data field corresponding to the icon dropped into the series drop area. An illustrative example follows.

Turning flow to FIG. **3A**, a sample graph template **300** may be seen. The Product Family and Product Department icons **322** have been dropped in the category drop area **306**. As a result, the data points **204** corresponding to these data fields **202** are displayed along the x-axis. Similarly, the Stores Sales data fields **202** has been dropped in the data drop area **314**, resulting in the data points **204** comprising the Store Sales data field being graphically displayed in the data drop area **314**. It may further be seen that the Time data field **202** has been dropped in the series drop area **302**. The placement of the Time data field **202** in the series drop area **302** subdivides the data points **204** comprising the Store Sales data field graphically displayed in the data drop area. The series display **330** shows all possible values for the data field placed in the series drop area. In the instant example, data points **204** comprising the Time data field **202** may have one or two values: 1998 or 1997. In an exemplary embodiment, the series display **330** may also indicate a color for each type of data point **204** graphed in the data drop area **314**. These colors indicate which series of data points is shown in the data drop area.

To illustrate, the produce graphical display **324**, it is apparent that the produce graphical display is comprised of two separate, differently colored elements. Referring back to the series display **330**, it may be seen that the colored elements comprising the produce graphical display **324** correspond to series data points **202** "1997" and "1998". Therefore, the produce graphical display **324** is comprised of a 1997 produce graphical display **326** and a 1998 produce graphical display **328**. Thus, a user of an exemplary embodiment examining the graph template **300** displayed in FIG. **3A** may easily see not only a graphical display **324** of total produce sales for both years, but also a graphical display of 1997 produce sales **326** and a graphical display of 1998 produce sales **328**. This breakout of graphically tabulated

data by series allows a user to conveniently correlate an overall graph with constituent series elements.

Returning to FIG. **3**, a watermark **304** may be seen in each of the drop areas. For example, the series drop area **302** contains a watermark **304** reading simply "series." Similarly, the category drop area **306** contains a "category" watermark **304**. In an exemplary embodiment, the watermark **304** in each drop area may display the name of that drop area. These watermarks allow a user to quickly and easily identify the name of each drop area as well as its function. Once an icon **322** has been dropped in a drop area, the watermark **304** may be removed. Since the graph template **300** is updated to reflect the dropping of the icon **322** into a drop area, the function of the drop area will become immediately apparent and the watermark serves no further purpose.

In addition to the watermarks **304**, the cursor **332** also provides user feedback. As the cursor passes over drop areas, it changes shape to alert a user of an exemplary embodiment as to the consequences of dropping an icon in the drop area over which the cursor **332** hovers. For example, FIG. **3** displays a cursor **332** hovering partially over the data drop area **314**. The shape of the cursor **332** is changed in response to hovering over the data drop area **314** from an arrow to a rectangular shape consisting of four smaller rectangles. Each rectangle corresponds to a different drop area. As the cursor hovers over one of the drop areas, the rectangle corresponding to that drop area is shaded on the cursor **332**. Continuing the example of FIG. **3**, the large bottom right-hand-corner box is shaded. This indicates that the cursor is hovering above the data drop area **314**. If the cursor were to hover above the series drop area **302**, the leftmost rectangle of the cursor **332** would be shaded. Similarly, were the cursor to hover above the category drop area **306**, the middle rectangle would be shaded, and were the cursor to hover above the page drop area, the topmost rectangle would be shaded. The locations of the rectangles comprising the shape of the cursor **332** as it hovers over a drop area were chosen in order to reflect the approximate positions of those drop areas on the graph template **300**. Thus, a user may easily and quickly determine over which drop area the cursor **332** is positioned by examining which of the rectangles within the cursor is shaded. This enhanced user feedback allows a user of a exemplary embodiment to more quickly, easily, and efficiently create a graphical display of a set of data fields **202**.

FIGS. **4**A, **4**B, and **4**C display varying placements of the drop areas according to the style of graph template **300** selected. In FIG. **4**A, the drop area layout for a column column graph template **300** is displayed. When creating a column chart, the series drop area **302** is positioned to the right of the data drop area **314**, while the category drop area **306** and the page drop area **310** are positioned below and above the data drop area respectively. In an exemplary embodiment, the column chart layout comprises the default graph template **300**.

However, a user may elect to create a different type of graph. In this case, the layout of the graph template **300** depends on what type of alternate graph is chosen. FIG. **4**B displays a layout of the graph template **300** for a bar chart. When creating a bar chart, the series drop area **302** is again located to the right of the data drop area **314**. Similarly, the page drop area **310** is again located above the data drop area **314**. However, unlike the layout of the graph template **300** when creating a column chart, the category drop area **306** is located to the left of the data drop area **314** rather than beneath it.

Finally, a user may opt to create a pie chart. FIG. **4**C displays the layout of the graph template **300** in this event. Here not only are the layouts of the drop areas changed, but the shape of several of the drop areas vary as well. The data drop area is circular, rather than rectangular. This reflects the fact that a pie chart, unlike a column chart or a bar chart, is round. Although the page drop area **310** is still located above the data drop area **314**, the positions of the category drop area **306** and the series drop area **302** are changed. The category drop area **306** is located to the right of the data drop area **314**. The series drop area **302** is located beneath the data drop area **314**. Further, the series drop area has less height than it does in the graph template **300** for either a column chart or a bar chart. Essentially, when creating a pie chart, the positions of the category drop area **306** and the series drop area **302** are reversed from their respective positions in the column column graph template **300** shown in FIG. **4**A.

In addition to allowing a user to create multiple styles of graphs, an exemplary embodiment may also allow a user to change between graph styles during creation or viewing of a graph, or "on the fly." Oftentimes, a user may desire to view a completed or partially completed graph in a different format. An exemplary embodiment may allow a user to take such a graph and alter its style without recreating the graph on a new graph template **300**. Instead of forcing a user to regraph data fields **202** by dropping icons **322** into drop areas, a user of an exemplary embodiment may simply select a new graph style from a menu. The exemplary embodiment then not only updates the position of the drop areas in the graph template **300**, but also regraphs the data fields **202** as well. Allowing a user to switch between graph templates **300** on the fly is advantageous in that it saves valuable user time and effort that would otherwise be directed to regraphing data fields **202**.

FIG. **5** displays an exemplary graph window **500** containing an exemplary completed graph based on the data fields **202** shown in FIG. **2**, and displayed on the graph template discussed with respect to FIG. **3**. The graph template displayed in the exemplary graph window **500** is a column graph. Since no icons **322** have been dropped in the series drop area **302**, the watermark **304** is still present. Further, because no icons **322** have been dropped in the series drop area **302**, the only entry in the series display **330** reads "Total." This signifies that the data points **204** corresponding to the data fields **202** displayed in the data drop area **314** are aggregate totals, rather than being broken out by series. Breaking out graphs by series is more fully discussed with respect to FIG. **3**A.

Two icons **322** have been dropped in the category drop area **306**. These icons represent the Product Family and Product Department data fields **202**. It can be seen that there are two sets of entries along the x-axis of the graph template **300** displayed in the exemplary graph window **500**. One set of entries, corresponding to the Product Department data field **202**, has twenty-one entries ranging from "Alcoholic" to "Periodicals." These are the individual data fields **202** for which store sales are graphed in the data drop area **314**. The second set of entries corresponds to the Product Family data field **202**. There are three possible values for data points **204** in the Product Family data field: Drink, Food, and Non-Consumable. Because there are two separate data fields **202** within the category drop area **306**, one data field is necessarily nested within the other. In the example of FIG. **5**, the Product Department data field **202** is nested within the Product Family data field. That is, while all twenty-one individual data points **204** of the Product Department data field are listed on the x-axis of the exemplary graph window **500**, they are grouped according to the type of Product Family to which each belongs. For example, the Alcoholic,

Beverages, and Dairy Product Departments are parts of the Drink Product Family.

A user may wish to place more than one field on the x-axis in order to see one data field **202** broken out in terms of a second data field. In the current example, a user may have determined that simply graphing all store sales in terms of Drink, Food, and Non-consumable items is insufficiently detailed. However, a user may still be interested in these broad categories in order to determine which of the three is most profitable. Therefore, it becomes necessary for the user to view each Product Department broken out by Product Family. In order to permit such an in-depth view of data, an exemplary embodiment may permit the placement of more than one data field **202** on an axis. Typically, the leftmost data field **202** displayed in the category drop area **306** corresponds to the data field by which the data field immediately to the right is broken out. It is possible to nest multiple data fields **202** in this manner.

Continuing with the example of FIG. **5**, tooltip **502** is shown. The tooltip **502** appears when the cursor **332** is positioned proximate to over a drop area. The tooltip provides a level of user feedback beyond that given by changing the shape of the cursor **332**. Typically, the tooltip **502** explains the consequences of dropping an icon **322** in a specific drop area. In the current example, the tooltip **502** indicates that any icons **322** dropped in the data drop area **314** will become data items by displaying the text "Drop Data Items Here." Similar tooltips exists for the other drop areas. In addition to appearing when the cursor **332** is positioned proximate to a data field, the tooltip will follow the motion of the cursor.

While the tooltip **502** follows the motion of the cursor **332**, it disappears from the display screen **47** in the event that the cursor exceeds the boundaries of the drop area over which it was positioned. This is done in order to ensure that only proper user feedback is given, rather than indicating to a user that an icon may be dropped beyond the boundaries of a drop area and still be incorporated into the drop area.

As previously discussed, a user may nest one data field **202** within another in either the category drop area **306** or the series drop area **302** in order to view various data breakouts. An exemplary embodiment may further allow a user to reorder these data fields within the series drop area or the category drop area. This allows a user to view different graphical permutations of the same set of data without requiring the user to redisplay the data on a new graph template **300**. FIGS. **6** and **7** display this process.

Turning now to FIG. **6**, the initial steps in reordering data fields **202** within the category drop area **306** may be seen. In an exemplary embodiment, a user first selects an icon **322** within the category drop area **306** corresponding to the data field **202** which he wishes to move. As the icon is moved within the category drop area, the cursor **332** assumes an I-bar shape **600** in order to indicate where the icon will be placed if it is dropped. Further user feedback is provided by the appearance of a tooltip **502** stating, "Drop to reorder category axis." The combination of these two features allows an exemplary embodiment to indicate the consequences of reordering an icon **322** within either the category drop area **306** or the series drop area **302**.

FIG. **7** displays a graph within a reordered graph window **700**. While the data fields **202** and data points **204** are identical to those displayed in FIG. **5**, the Product Department and Product Family data fields have been reordered within the category drop area **306**. Thus, instead of breaking out each product department by its product family (for example, showing Alcoholic, Beverages, and Dairy as subcategories of Drink), now the Product Family data field **202** is broken out by the Product Department data field. Thus, a user may take multiple views of the same set of data fields **202** without going through the process of creating a new graphical display on a new graph template **300**.

FIGS. **8** and **9** depict flowcharts detailing the steps taken by an exemplary embodiment operating in the exemplary operating environment in order to graphically display data fields **202** within a graph template **300**. The flowchart begins with step **800** on FIG. **8**. In step **800**, a range of data fields to be graphically displayed is inputted. After the data fields are determined, step **805** is entered.

In step **805**, the data fields inputted in step **800** are displayed as icons **322** in a field list **320**. Next, an icon is selected in step **810**. Typically, an icon **322** may be selected through the use of an input device, such as a mouse **42**, by positioning a cursor **332** over the desired icon located in the field list **320**, depressing a mouse button, and moving the mouse while keeping the mouse button depressed. Other input devices may also be used for the selection of an icon in step **810**, such as a keyboard **40**, trackball, light pen, joystick, microphone, and others that will occur to those skilled in the art. These examples are offered by way of illustration rather than limitation. Alternative input devices may be used without departing from the spirit or letter of this invention. Once an icon **322** has been selected, the icon may be freely moved about the screen until a "drop" command is initiated. After step **810** is executed, decision step **815** is entered.

A determination is made in step **815** whether the cursor is positioned proximate to a drop area. If so, then step **900** of FIG. **9** is accessed. Generally, FIG. **9** deals with the addition of an icon **322** to a drop area and the resulting graphical display of the data field **202** associated with that icon. A detailed discussion of FIG. **9** follows this discussion of FIG. **8**.

If it is determined in decision step **815** that the cursor is not positioned proximate to a drop area, then in step **820** it must be determined if the icon **322** selected in step **810** has been dropped. Typically, an icon is dropped by releasing the mouse **42** button depressed in step **805**. Releasing the mouse button indicates that a user no longer wishes to drag or otherwise manipulate the selected icon **322**, but instead wishes to place it on the area of the screen over which the cursor **332** currently is positioned. Again, an icon **322** may be dropped in other ways apparent to those skilled in the art, such as the initiation of a drop signal through the use of an input device such as a keyboard **40**. These alternatives are fully embraced by this specification and the claims that follow.

If the icon **322** is not dropped in step **820**, then step **815** is once again accessed to determine whether the cursor is positioned proximate to a drop area. This loop is repeated as quickly as the exemplary operating environment allows in order to repeatedly poll for the presence of the cursor **332** over a drop area, or alternately the dropping of the icon **322**.

However, in the event that it is determined in step **820** that the icon **322** is dropped, then step **825** is accessed. In step **825**, the icon **322** is returned to the field list **320**. The icon is replaced in the field list in step **825** because it was placed on a portion of the graph template **300** other than a designated drop area; that is, the icon was dropped over a section of the graph template that does not accept or allow for the manipulation of icons. In this event, the placement of the icon **322** does not result in the graphical display of any data fields **202** on the graph template **300**. Instead, the icon **322** is returned to the field list **320** in order to allow a user to

reselect and place it in one of the drop areas provided on the graph template. Once the icon is returned to the field list **320** in step **825**, end state **830** is accessed.

FIG. **9** displays the portion of the flowchart entered if it is determined in step **815** of FIG. **8** that the cursor is hovering above a drop area. From step **815**, step **900** of FIG. **9** is entered. In step **900**, it is determined whether the cursor **332** is hovering above the series drop area **302**. If this decision yields a positive result, then step **902** is entered. In step **902**, the tooltip **502** corresponding to the series drop area **302** is displayed. Typically, this tooltip reads "Drop series fields here." The tooltip **502** gives the user valuable feedback describing the consequences of dropping the icon **322** in this particular drop area; namely, that the data field **202** associated with the icon will be added to the series drop area **302**.

Once step **920** is executed, step **903** is initiated. In step **903**, the shape of the cursor is changed to a representation of a graph template **300**. As a further element of user feedback, the portion of the changed cursor corresponding to the drop area over which the cursor is positioned is shaded. This informs the user which drop area an icon will be added to if it is dropped at this point. In step **903**, the shaded portion of the cursor **332** is the leftmost rectangle, signifying that the cursor is positioned over the series drop area **302**.

Following step **903**, it must be decided in step **904** whether the icon **322** has been dropped in the series drop area **302**. If not, then step **815** of FIG. **8** is entered. This is done in order to reflect the fact that a user may be dragging an icon **322** across the series drop area **302** in order to reach another portion of the graph template **300**, such as the data drop area **314**. In this example, it must be continuously reevaluated whether the cursor remains over the series drop area **302**, has passed into an intermediate portion of the graph template **300**, or is now in the data drop area **314**. This continuous poll is implemented by returning to step **815** of FIG. **8** and stepping through the decision logic again.

Alternatively, it may be determined in step **904** that the icon **322** has been dropped in the series drop area **302**. If so, step **906** is accessed and the data field **202** represented by the icon **322** is added to the series drop area **302**. This results in the graphical display of the data field in the series drop area, as well as the subdivision of any data graphically displayed in the data drop area **314**. This subdivision of data was more fully discussed with respect to FIG. **3**A.

Following step **906**, the tooltip **502** is removed from the display screen **47** in step **908**. Finally, end step **942** is accessed.

However, it may be determined in step **900** that the cursor **332** is not positioned above the series drop area **302**. In this event, decision step **910** is entered and a determination is made whether the cursor **332** is currently positioned above the category drop area **306**.

If this decision yields a positive result, then step **912** is entered. In step **912**, the tooltip **502** corresponding to the category drop area **306** is displayed. Typically, this tooltip reads "Drop category fields here." The tooltip **502** gives the user valuable feedback describing the consequences of dropping the icon **322** in this particular drop area; namely, that the data field **202** associated with the icon will be added to the category drop area **306**.

Once step **912** is executed, step **913** is initiated. In step **913**, the shape of the cursor is changed to a representation of a graph template **300**. As a further element of user feedback, the portion of the changed cursor corresponding to the drop area over which the cursor is positioned is shaded. This informs the user which drop area an icon will be added to if it is dropped at this point. In step **913**, the shaded portion of the cursor **332** is the middle rectangle, signifying that the cursor is positioned over the category drop area **306**.

Following step **913**, it must be decided in step **914** whether the icon **322** has been dropped in the category drop area **306**. If not, then step **815** of FIG. **8** is entered.

Alternately, it may be determined in step **914** that the icon **322** has, been dropped in the category drop area **306**. If so, step **916** is accessed and the data field **202** represented by the icon **322** is added to the category drop area **306**. This results in the graphical display of the data field in the category drop area, as well as the regraphing of any data graphically displayed in the data drop area **314**.

Following step **916**, the tooltip **502** is removed from the display screen **47** in step **918**. Finally, end step **942** is accessed.

It may be determined in step **910** that the cursor **332** is not positioned above the category drop area **306**. In this event, decision step **920** is entered and a determination is made whether the cursor **332** is currently positioned above the page drop area **310**.

If this decision yields a positive result, then step **922** is entered. In step **922**, the tooltip **502** corresponding to the page drop area **310** is displayed. Typically, this tooltip reads "Drop page fields here." The tooltip **502** gives the user valuable feedback describing the consequences of dropping the icon **322** in this particular drop area; namely, that the data field **202** associated with the icon will be added to the page drop area **310**.

Once step **922** is executed, step **923** is initiated. In step **923**, the shape of the cursor is changed to a representation of a graph template **300**. As a further element of user feedback, the portion of the changed cursor corresponding to the drop area over which the cursor is positioned is shaded. This informs the user which drop area an icon will be added to if it is dropped at this point. In step **923**, the shaded portion of the cursor **332** is the topmost rectangle, signifying that the cursor is positioned over the page drop area **310**.

Following step **923**, it must be decided in step **924** whether the icon **322** has been dropped in the page drop area **310**. If not, then step **815** of FIG. **8** is entered.

Alternatively, it may be determined in step **924** that the icon **322** has been dropped in the page drop area **310**. If so, step **926** is accessed and the data field **202** represented by the icon **322** is added to the page drop area **310**. This results in the graphical display of the data field associated with the drop icon in the page drop area, as well as the subdivision of any data graphically displayed in the data drop area **314**. This subdivision of data into separate pages was more fully discussed with respect to FIG. **3**.

Following step **926**, the tooltip **502** is removed from the display screen **47** in step **928**. Finally, end step **942** is accessed.

In the event that it is determined in step **920** that the cursor **332** is not hovering above the page drop area **310**, then step **932** is entered. In step **932**, the tooltip **502** corresponding to the data drop area **314** is a displayed. Typically, this tooltip reads "Drop data fields here." The tooltip **502** gives the user valuable feedback describing the consequences of dropping the icon **322** in this particular drop area; namely, that the data field **202** associated with the icon will be added to the data drop area **314**.

Once step **922** is executed, step **933** is initiated. In step **933**, the shape of the cursor is changed to a representation of a graph template **300**. In order to provide additional user feedback, the portion of the changed cursor corresponding to the drop area over which the cursor is positioned is shaded.

This informs the user which drop area an icon will be added to if it is dropped at this point. In step **933**, the shaded portion of the cursor **332** is the bottom right rectangle, signifying that the cursor is positioned over the data drop area **314**.

Following step **933**, it must be decided in step **934** whether the icon **322** has been dropped in the data drop area **314**. If not, then step **815** of FIG. **8** is entered for the reasons discussed above with respect to step **904**.

Alternatively, it may be determined in step **934** that the icon **322** has been dropped in the data drop area **314**. If so, step **936** is accessed and the data field **202** represented by the icon **322** is added to the data drop area **314**. This results in the graphical display of the data field associated with the dropped icon in the data drop area, as discussed with respect to FIG. **3**.

Next, in step **938** the tooltip **502** is removed. Following the removal of the tooltip in step **938**, end state **942** is accessed.

Conclusion

From the foregoing description, it will be appreciated that an exemplary embodiment supports a method for graphically displaying data fields. Specifically, an exemplary embodiment allows a user to select a range of data points grouped into data fields, choose a graph template, and graphically display the data fields of his choice through manipulating icons representing those data fields within the drop areas of the graph template. As a result, the user may more conveniently access and manipulate information stored in a database format.

The invention may conveniently be implemented in one or more program modules that are based upon the flowcharts of FIGS. **8** and **9** and the features illustrated in FIGS. **2–7**. No particular programming language has been described for carrying out the various procedures described above because it is considered that the operations, steps, and procedures described above and illustrated in the accompanying drawings are sufficiently disclosed to permit one of ordinary skill in the art to practice an exemplary embodiment. Moreover, there are many computers and operating systems which may be used in practicing an exemplary embodiment and therefore no detailed computer program could be provided which would be applicable to all of these many different systems. Each user of a particular computer will be aware of the language and tools which are most useful for that user's needs and purposes.

Although an exemplary embodiment was described using a spreadsheet database as the exemplary program, those skilled in the art will appreciate that an exemplary embodiment is not limited to this arrangement, but may include any means of accessing a set of data fields and manipulating those data fields. For example, the display of a spreadsheet on a web browser in HTML is embraced by the spirit of an exemplary embodiment. Further, although the term "spreadsheet" has been used throughout this document, an exemplary embodiment may manipulate any form of database or data fields. Further, although an exemplary embodiment was described using a mouse as the input device, those skilled in the art will appreciate that an exemplary embodiment is not limited to this arrangement, but may include multiple forms of input devices, such as trackballs, keyboards, light pens, joysticks, and so forth.

Alternative embodiments will become apparent to those skilled in the art to which an exemplary embodiment pertains without departing from its spirit and scope. Accordingly, the scope of an exemplary embodiment is defined by the appended claims rather than the foregoing description.

We claim:

1. A method for graphically representing a set of data fields, comprising:

displaying a plurality of icons on a display screen, the icons corresponding to the data fields;

providing on the display screen a data drop area and a non-data drop area to which the icons may be dragged, wherein the non-data drop area is selected from a group consisting of a series drop area, a category drop area, and a page drop area, and wherein the data drop area and the non-data drop area correspond to a portion of a graph template;

dragging a certain one of the icons to a selected one of the provided drop areas;

dropping the certain icon in the selected provided drop area; and

displaying in graphical format on the display screen the data field corresponding to the certain icon in the portion of the graph template corresponding to the selected provided drop area.

2. The method of claim **1**, further comprising:

selecting one of a plurality of graph templates; and

rearranging the graphically displayed data field according to the selected graph template.

3. The method of claim **2**, wherein the position of the drop areas on the display screen varies according to the selected graph template.

4. The method of claim **1**, wherein a watermark stating the function of the drop area is displayed within the drop area.

5. The method of claim **4**, wherein the watermark displays the name of the drop area.

6. The method of claim **4**, further comprising removing the watermark from the drop area in response to dropping the certain icon in the drop area.

7. A computer-implemented method for creating a computer database graph, comprising:

selecting a plurality of data fields from a database, each data field comprising a plurality of data points;

displaying a graph template comprising a series drop area, a category drop area, a data drop area, a page drop area, and a field list;

displaying in the field list a plurality of icons corresponding to the data fields;

receiving a first indication signal that a one of the icons has been selected;

in response to receiving the first indication signal, permitting the selected icon to be moved from the field list;

receiving a second indication signal that the selected icon has been moved to a certain one of the series, category, page, or data drop areas;

in response to receiving the second indication signal, displaying the data field corresponding to the selected icon in graphical format within a certain one of the series drop area, an axis of the graph template, the page drop area, or the data drop area.

8. The computer-implemented method of claim **7**, wherein the graph template is chosen from a group comprising a bar graph, a pie graph, and a column graph.

9. The computer-implemented method of claim **7**, further comprising:

receiving a third indication signal that another graph template has been selected; and

in response to receiving the third indication signal, changing the positions and shapes of the data fields displayed on the selected graph template.

10. The computer-implemented method of claim 7, further comprising:

receiving a third indication signal that a cursor is positioned proximate to a portion of the graph template; and

in response to receiving the third indication signal, displaying on a display screen text proximate to the cursor indicating the features of the portion of the graph template.

11. The computer-implemented method of claim 10, further comprising:

moving the cursor;

moving the text to follow the cursor;

receiving a fourth indication signal that a cursor has moved beyond the portion of the graph template; and

in response to receiving the fourth indication signal, removing the text from the display screen.

12. The computer-implemented method of claim 7, wherein the series drop area, category drop area, data drop area, and page drop area contain text designating the name of each area.

13. The computer-implemented method of claim 7, further comprising ordering the data points graphically displayed in the data drop area according to the order of the data fields displayed in the series and category drop areas.

14. The method of claim 13, further comprising:

displaying the names of the data fields corresponding to the icons dropped in the category drop area in a row;

receiving an indication signal that one of the names of the data fields has been moved;

in response to receiving an indication signal that one of the names of the data fields has been moved, displaying a marker indicating the position of the name;

receiving an indication signal that the name of the data field has been reordered;

in response to receiving the indication signal that the name of the data field has been reordered, placing the name in the row at the position corresponding to the marker; and

reordering the data points displayed in the data drop area according to the new arrangement of data fields displayed in the category drop area.

15. The method of claim 13, further comprising:

displaying the names of the data fields corresponding to the icons dropped in the series drop area in a column;

receiving an indication signal that one of the names of the data fields has been moved;

in response to receiving an indication signal that one of the names of the data fields has been moved, displaying a marker indicating the position of the name;

receiving an indication signal that the name of the data field has been reordered;

in response to receiving the indication signal that the name of the data field has been dropped, placing the name in the column at the position corresponding to the marker; and

reordering the data fields displayed in the data drop area according to the new arrangement of data fields displayed in the series drop area.

16. A computer-readable medium on which is stored a program module for creating a database graph, the program module comprising instructions which, when executed by a computer, perform the steps of:

selecting a plurality of data fields from a database, each data field comprising a plurality of data points;

displaying a graph template comprising a series drop area, a category drop area, a data drop area, a page drop area, and a field list;

displaying in the field list a plurality of icons corresponding to the data fields;

receiving a first indication signal that an icon has been selected through the use of a cursor;

in response to receiving the first indication signal, permitting the selected icon to be moved from the field list;

receiving a second indication signal that the selected icon and cursor have been positioned proximate to the series, category, page, or data drop areas;

in response to receiving the second indication signal, displaying text on a display screen indicating the features of the portion of the graph template;

receiving a third indication signal that the selected icon has been dropped in a certain one of the series, category, page, or data drop areas; and

in response to receiving the third indication signal, displaying the data field corresponding to the selected icon in graphical format within a certain one of the series drop area, an axis of the graph template, the page drop area, or the data drop area.

17. The computer-readable medium of claim 16, further comprising:

receiving a fourth indication signal that the cursor has moved;

in response to receiving the fourth indication signal, tracking the movement of the cursor with the help text;

receiving a fifth indication signal that the cursor is no longer positioned proximate to a certain one of the series, category, page, or data drop areas; and

in response to receiving the fifth indication signal, removing the text from the display screen.

18. The computer-readable medium of claim 16, further comprising:

receiving an indication that the cursor is positioned proximate to the series drop area;

in response to receiving the indication that the cursor is positioned proximate to the series drop area, changing the shape of a cursor to that of a column chart with four divisions, the leftmost division highlighted;

receiving an indication that the cursor is hovering over the category drop area;

in response to receiving the indication that a cursor is positioned proximate to the category drop area, changing the shape of the cursor to that of a column chart with four divisions, the bottommost division highlighted;

receiving an indication that a cursor is positioned proximate to the page drop area;

in response to receiving the indication that a cursor is positioned proximate to the page drop area, changing the shape of the cursor to that of a column chart with four divisions, the topmost division highlighted;

receiving an indication that a cursor is is positioned proximate to the data drop area; and

in response to receiving the indication that a cursor is positioned proximate to the data drop area, changing the shape of the cursor to that of a column chart with four divisions, the middle division highlighted.

19. The computer-readable medium of claim 16, wherein the positions of the series drop area, the category drop area, the data drop area, and the page drop area vary according to which of a plurality of graph templates is selected.

20. The computer-readable medium of claim **16**, wherein the data points graphically displayed in the data drop area are ordered according to the order of the data fields graphically displayed in the series drop area and the category drop area.

21. The computer-readable medium of claim **16**, further comprising:

displaying the data fields in the category drop area in a row;

receiving a third indication signal that one of the data fields displayed in the category drop area has been moved to another portion of the row;

in response to receiving the third indication signal, reordering the data fields in the row to accommodate the movement of the moved data field; and

reordering the graphical display of the data points in the data drop area according to the new order of the data fields displayed in the row.

22. The computer-readable medium of claim **16**, wherein the field list contains an indicator operative to indicate whether an icon has been placed in a drop area.

* * * * *