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Marshall et al.

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(54) **METHOD AND SYSTEM FOR DISPLAYING RELATED INFORMATION FROM A DATABASE**

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(73) Assignee: **Apple Inc.**, Cupertino, CA (US)

(21) Appl. No.: **10/213,271**

(22) Filed: **Aug. 5, 2002**

(Under 37 CFR 1.47)

Related U.S. Patent Documents

Reissue of:
(64) Patent No.: **6,101,493**
Issued: **Aug. 8, 2000**
Appl. No.: **09/268,859**
Filed: **Mar. 15, 1999**

U.S. Applications:
(63) Continuation of application No. 08/732,705, filed on Oct. 18, 1996, now Pat. No. 5,926,806.

(51) **Int. Cl.**
G06F 17/30 (2006.01)

(52) **U.S. Cl.** ..... **707/3**; 707/2; 707/6; 707/8; 707/103 R; 707/201; 715/530; 715/726; 715/751; 715/804

(58) **Field of Classification Search** ..... 707/2, 707/3, 6, 8, 10, 102, 103 R, 201; 345/803, 345/788, 744, 784; 715/507, 526, 530, 726, 715/750, 804
See application file for complete search history.

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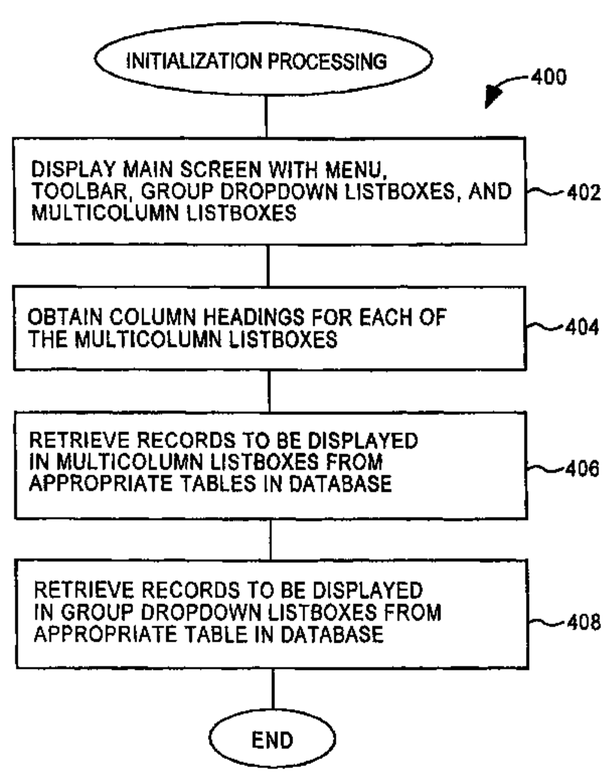
Primary Examiner—Thuy N. Pardo
(74) *Attorney, Agent, or Firm*—Fenwick & West LLP

(57) **ABSTRACT**

A technique for displaying information from related tables of a database in different display windows on a display screen associated with a computer system is disclosed. The different display windows are interlinked such that a selection of one or more entries in one of the display windows causes the other of the display windows to distinguishably and orderly display those entries that are related to the selection. A graphical user interface (GUI) in which a main screen is produced having the interlinked display windows is also disclosed.

76 Claims, 18 Drawing Sheets



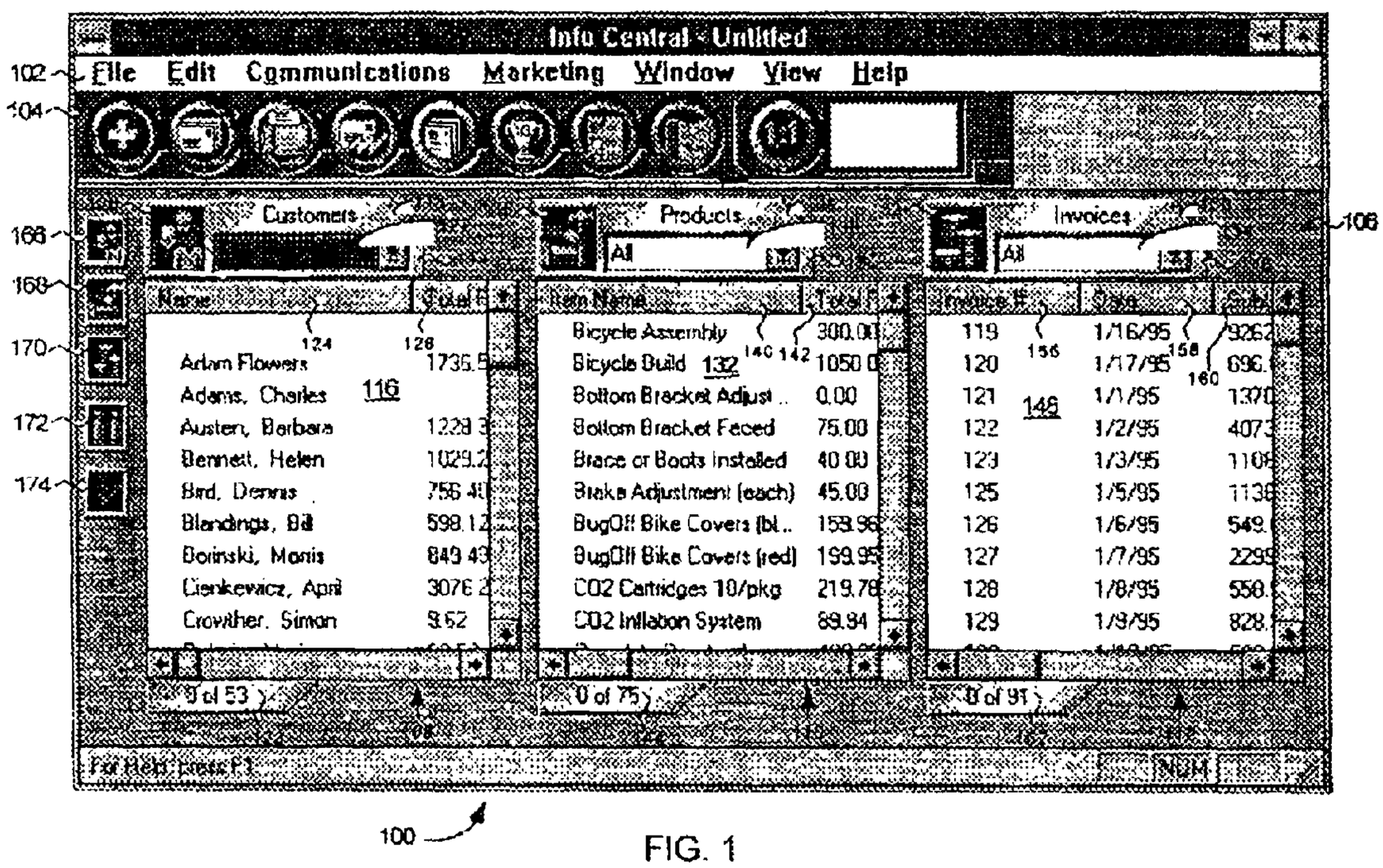

Info Central - Untitled
File Edit Communications Marketing Window View Help
Customers
Products
Invoices
Name
Total
Item Name
Invoice #
Adam Flowers
Adams, Charles
Austen, Barbara
Bennett, Helen
Bird, Dennis
Blandings, Bill
Bolinski, Morris
Cienkewicz, April
Crowther, Simon
Bicycle Assembly
Bicycle Build
Bottom Bracket Adjust
Bottom Bracket Faced
Brace or Boots Installed
Brake Adjustment (each)
BugOff Bike Covers (bl
BugOff Bike Covers (red)
CO2 Cartridges 10/pkg
CO2 Inflation System
For Help, press F1
NUM
102
104
106
100
116
124
126
132
140
142
146
156
158
160
166
168
170
172
174

FIG. 1

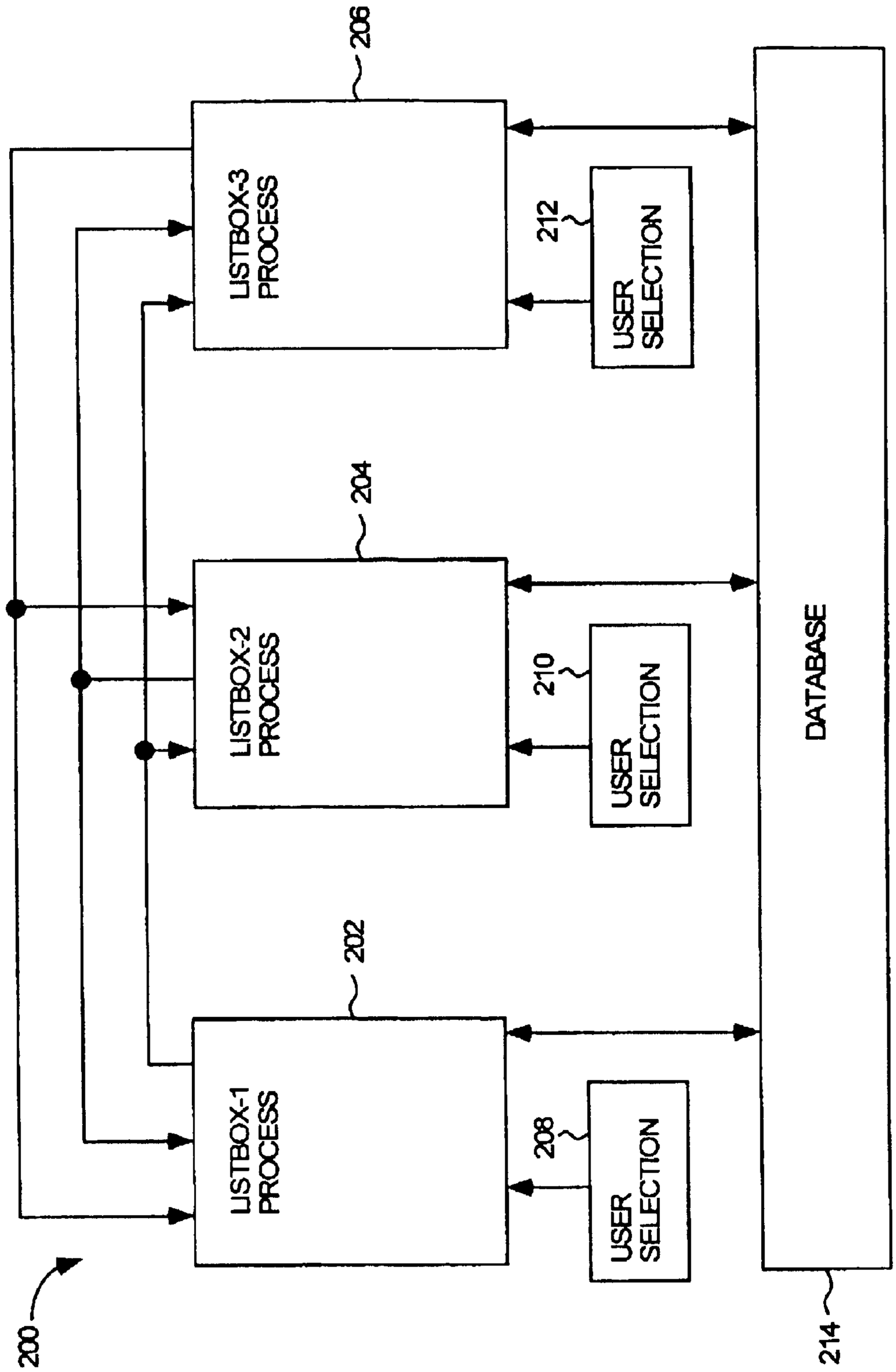

200
LISTBOX-1 PROCESS
202
LISTBOX-2 PROCESS
204
LISTBOX-3 PROCESS
206
USER SELECTION
208
USER SELECTION
210
USER SELECTION
212
DATABASE
214

FIG. 2

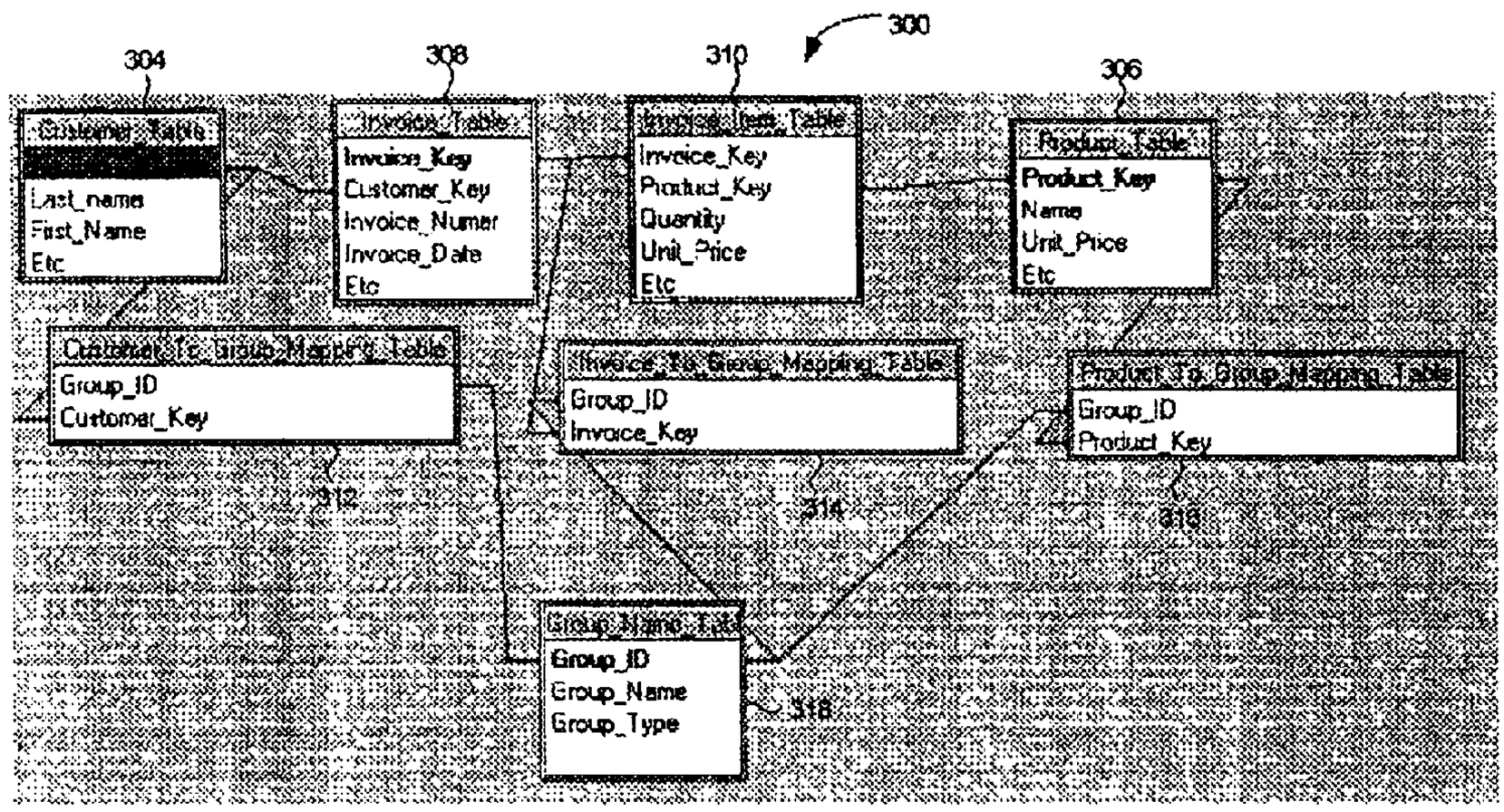

300
304
308
310
306
Customer_Table
Last_name
First_Name
Etc
Invoice_Table
Invoice_Key
Customer_Key
Invoice_Numer
Invoice_Date
Etc
Invoice_Item_Table
Invoice_Key
Product_Key
Quantity
Unit_Price
Etc
Product_Table
Product_Key
Name
Unit_Price
Etc
Customer_To_Group_Mapping_Table
Group_ID
Customer_Key
Invoice_To_Group_Mapping_Table
Group_ID
Invoice_Key
Product_To_Group_Mapping_Table
Group_ID
Product_Key
312
314
316
Group_Name_Table
Group_ID
Group_Name
Group_Type
318

FIG. 3

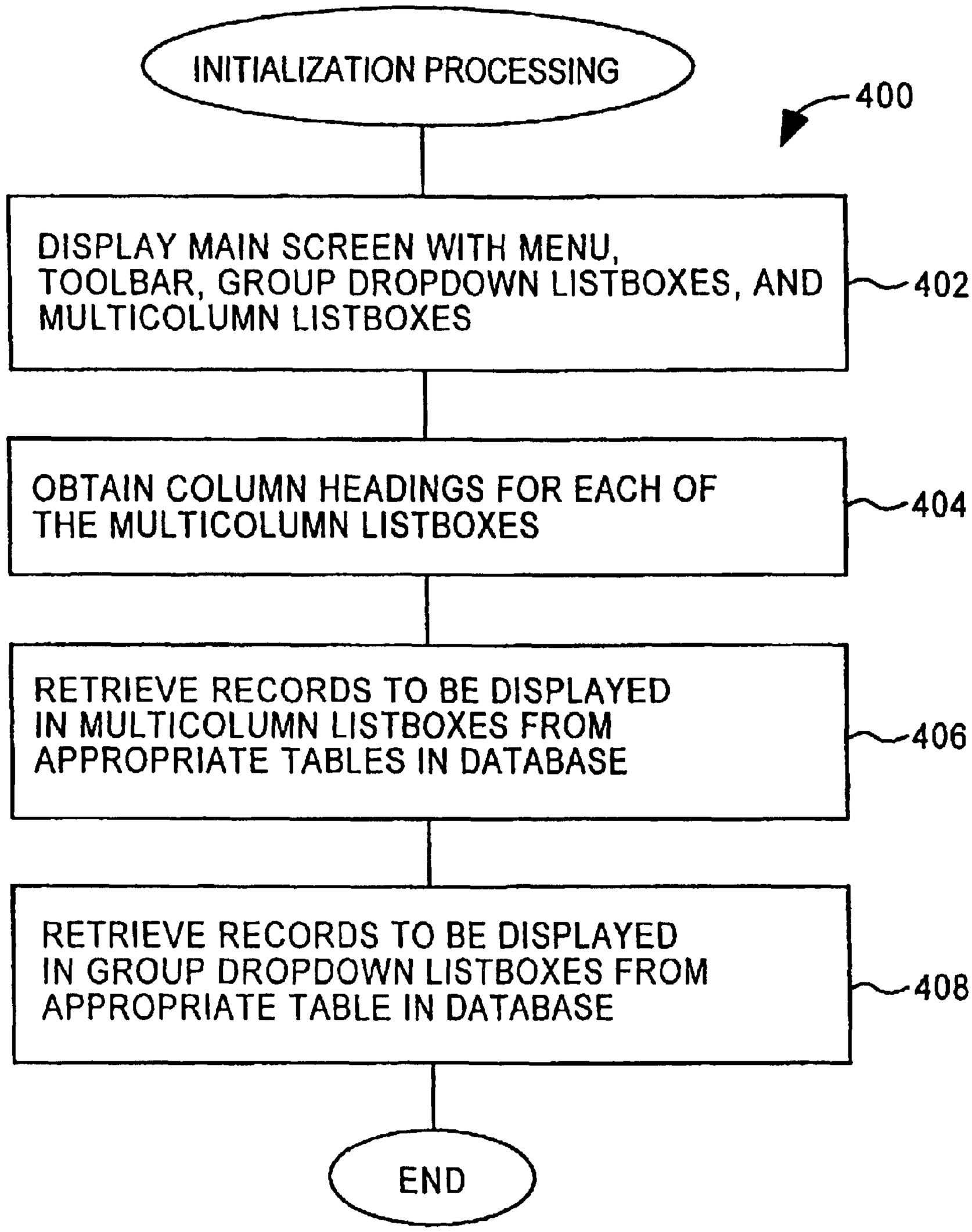

INITIALIZATION PROCESSING
400
DISPLAY MAIN SCREEN WITH MENU, TOOLBAR, GROUP DROPDOWN LISTBOXES, AND MULTICOLUMN LISTBOXES
402
OBTAIN COLUMN HEADINGS FOR EACH OF THE MULTICOLUMN LISTBOXES
404
RETRIEVE RECORDS TO BE DISPLAYED IN MULTICOLUMN LISTBOXES FROM APPROPRIATE TABLES IN DATABASE
406
RETRIEVE RECORDS TO BE DISPLAYED IN GROUP DROPDOWN LISTBOXES FROM APPROPRIATE TABLE IN DATABASE
408
END

FIG. 4

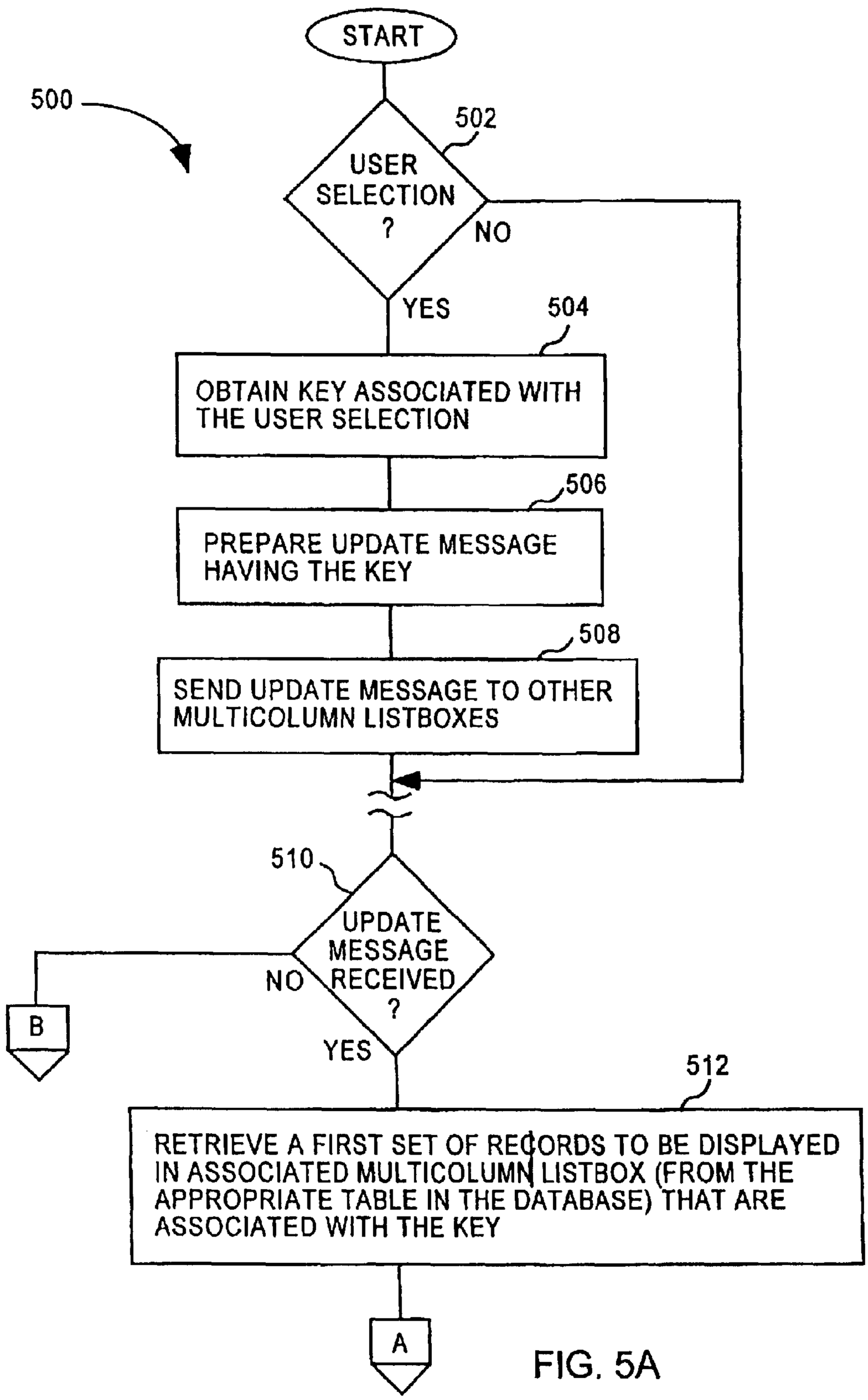

START
500
502
USER SELECTION ?
NO
YES
504
OBTAIN KEY ASSOCIATED WITH THE USER SELECTION
506
PREPARE UPDATE MESSAGE HAVING THE KEY
508
SEND UPDATE MESSAGE TO OTHER MULTICOLUMN LISTBOXES
510
UPDATE MESSAGE RECEIVED ?
NO
B
YES
512
RETRIEVE A FIRST SET OF RECORDS TO BE DISPLAYED IN ASSOCIATED MULTICOLUMN LISTBOX (FROM THE APPROPRIATE TABLE IN THE DATABASE) THAT ARE ASSOCIATED WITH THE KEY
A

FIG. 5A

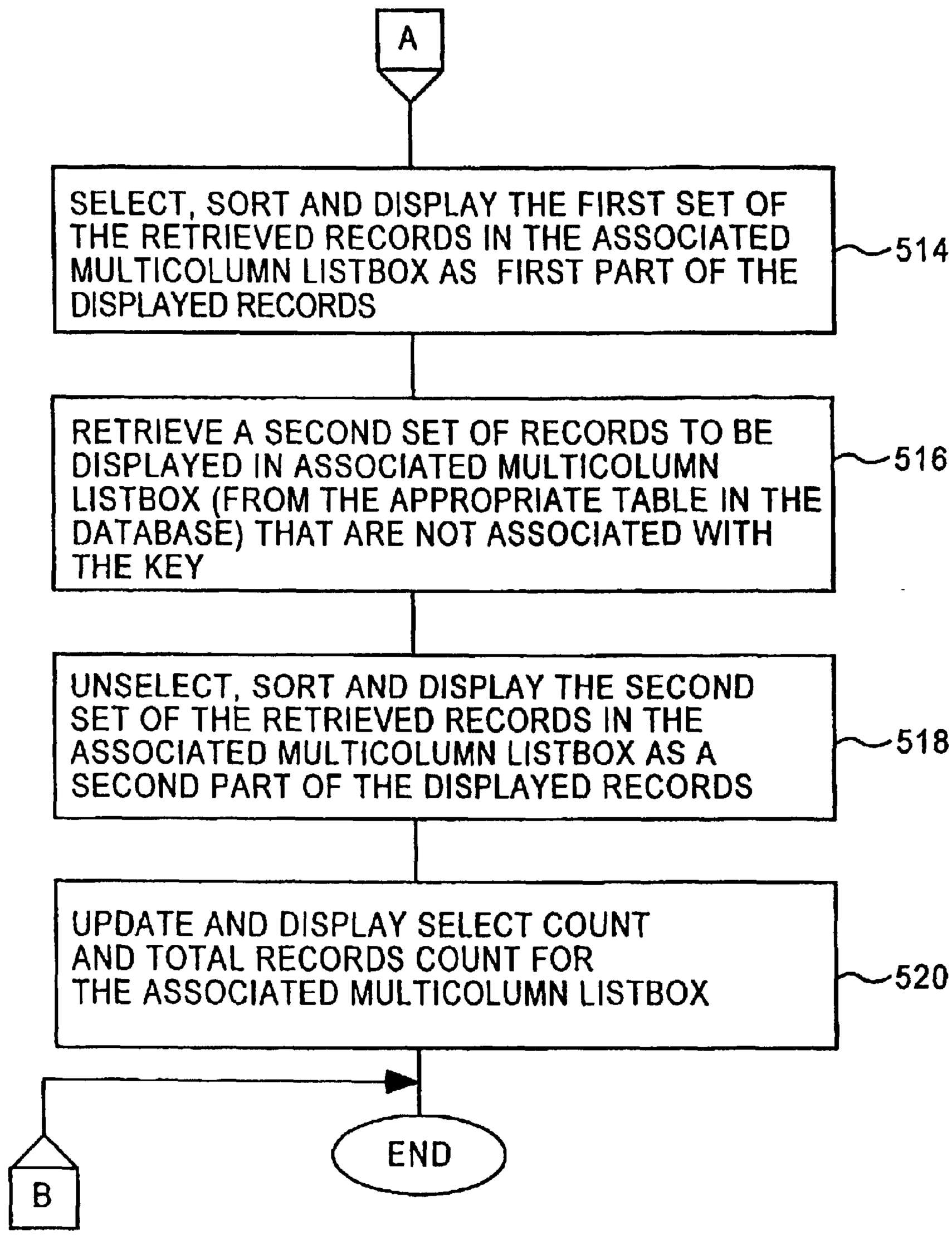

A
SELECT, SORT AND DISPLAY THE FIRST SET OF THE RETRIEVED RECORDS IN THE ASSOCIATED MULTICOLUMN LISTBOX AS FIRST PART OF THE DISPLAYED RECORDS
514
RETRIEVE A SECOND SET OF RECORDS TO BE DISPLAYED IN ASSOCIATED MULTICOLUMN LISTBOX (FROM THE APPROPRIATE TABLE IN THE DATABASE) THAT ARE NOT ASSOCIATED WITH THE KEY
516
UNSELECT, SORT AND DISPLAY THE SECOND SET OF THE RETRIEVED RECORDS IN THE ASSOCIATED MULTICOLUMN LISTBOX AS A SECOND PART OF THE DISPLAYED RECORDS
518
UPDATE AND DISPLAY SELECT COUNT AND TOTAL RECORDS COUNT FOR THE ASSOCIATED MULTICOLUMN LISTBOX
520
END
B

FIG. 5B

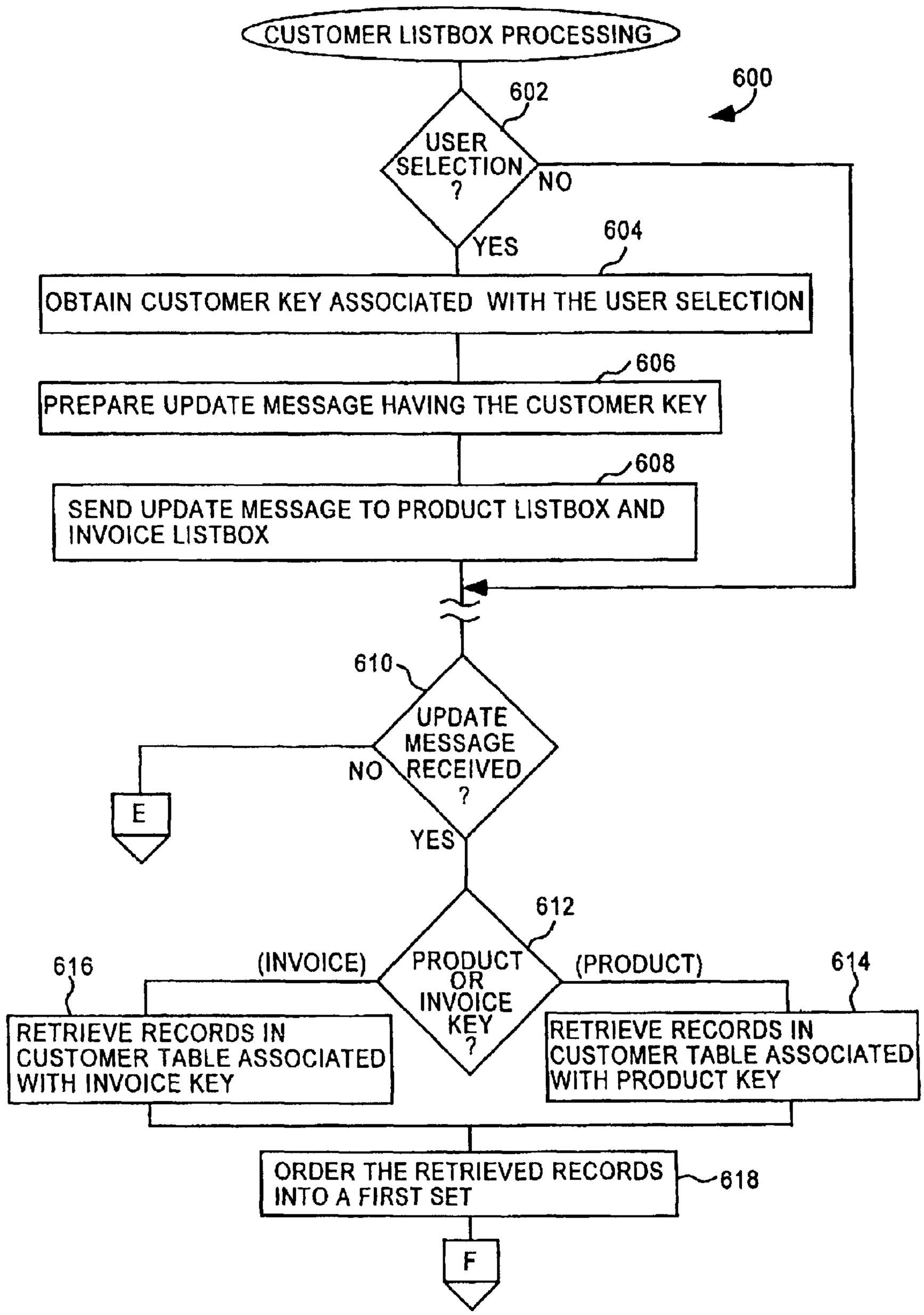

CUSTOMER LISTBOX PROCESSING
600
602
USER SELECTION ?
NO
YES
604
OBTAIN CUSTOMER KEY ASSOCIATED WITH THE USER SELECTION
606
PREPARE UPDATE MESSAGE HAVING THE CUSTOMER KEY
608
SEND UPDATE MESSAGE TO PRODUCT LISTBOX AND INVOICE LISTBOX
610
UPDATE MESSAGE RECEIVED ?
NO
E
YES
612
PRODUCT OR INVOICE KEY ?
(INVOICE)
(PRODUCT)
616
614
RETRIEVE RECORDS IN CUSTOMER TABLE ASSOCIATED WITH INVOICE KEY
RETRIEVE RECORDS IN CUSTOMER TABLE ASSOCIATED WITH PRODUCT KEY
ORDER THE RETRIEVED RECORDS INTO A FIRST SET
618
F

FIG. 6A

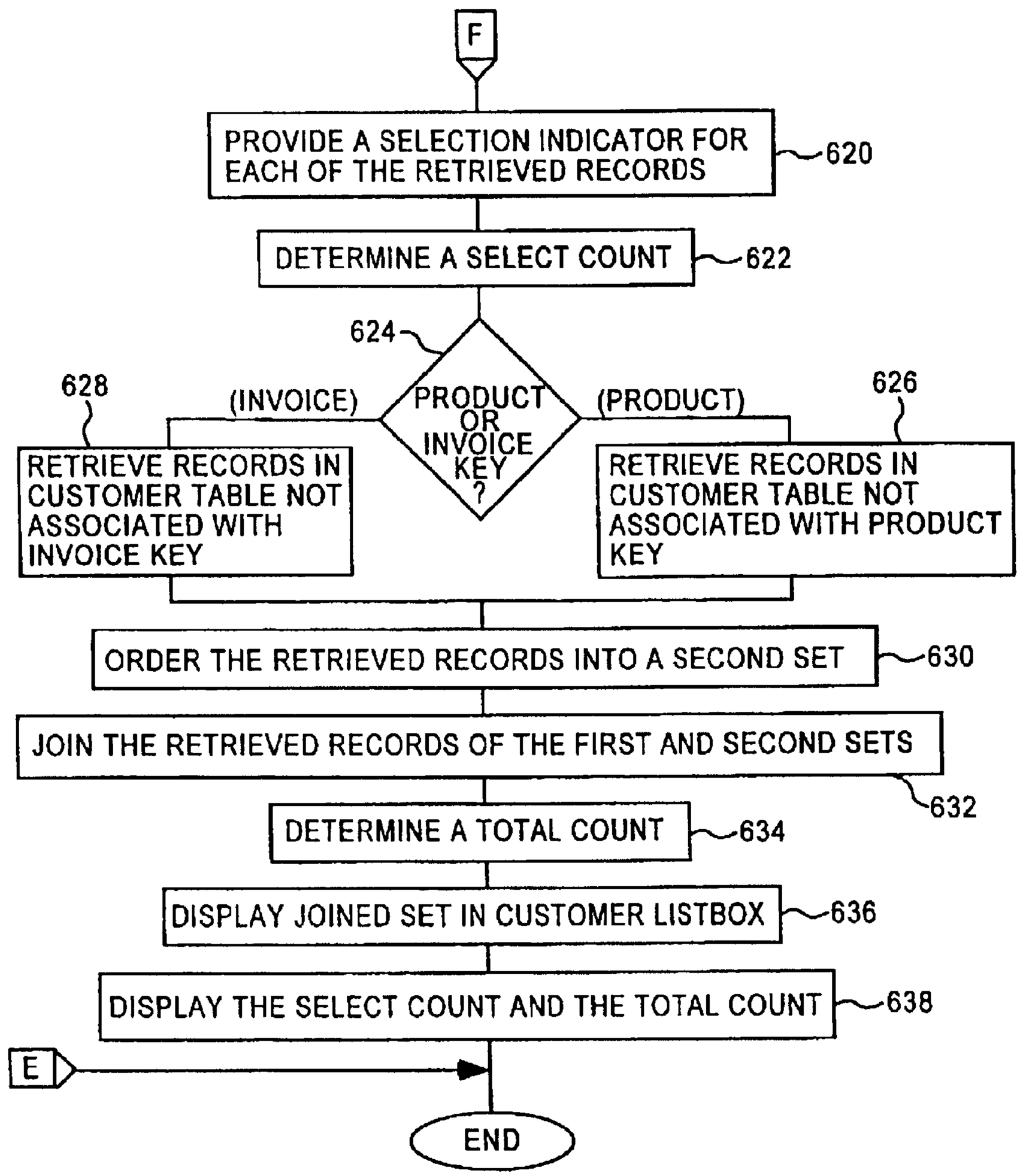

F
PROVIDE A SELECTION INDICATOR FOR EACH OF THE RETRIEVED RECORDS
620
DETERMINE A SELECT COUNT
622
624
PRODUCT OR INVOICE KEY ?
(INVOICE)
(PRODUCT)
628
626
RETRIEVE RECORDS IN CUSTOMER TABLE NOT ASSOCIATED WITH INVOICE KEY
RETRIEVE RECORDS IN CUSTOMER TABLE NOT ASSOCIATED WITH PRODUCT KEY
ORDER THE RETRIEVED RECORDS INTO A SECOND SET
630
JOIN THE RETRIEVED RECORDS OF THE FIRST AND SECOND SETS
632
DETERMINE A TOTAL COUNT
634
DISPLAY JOINED SET IN CUSTOMER LISTBOX
636
DISPLAY THE SELECT COUNT AND THE TOTAL COUNT
638
E
END

FIG. 6B

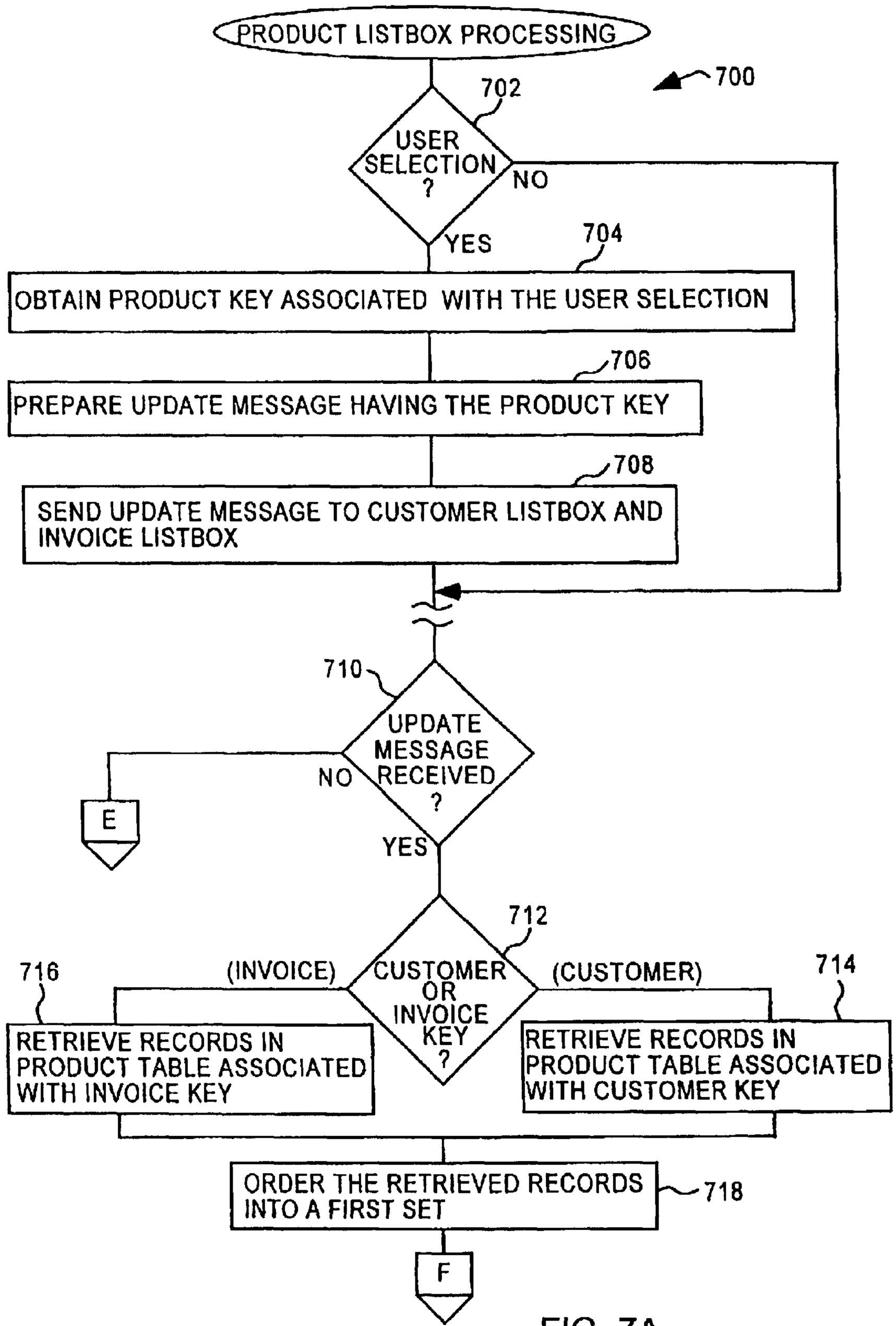

PRODUCT LISTBOX PROCESSING
700
702
USER SELECTION ?
NO
YES
704
OBTAIN PRODUCT KEY ASSOCIATED WITH THE USER SELECTION
706
PREPARE UPDATE MESSAGE HAVING THE PRODUCT KEY
708
SEND UPDATE MESSAGE TO CUSTOMER LISTBOX AND INVOICE LISTBOX
710
UPDATE MESSAGE RECEIVED ?
NO
E
YES
712
CUSTOMER OR INVOICE KEY ?
(INVOICE)
(CUSTOMER)
716
714
RETRIEVE RECORDS IN PRODUCT TABLE ASSOCIATED WITH INVOICE KEY
RETRIEVE RECORDS IN PRODUCT TABLE ASSOCIATED WITH CUSTOMER KEY
ORDER THE RETRIEVED RECORDS INTO A FIRST SET
718
F

FIG. 7A

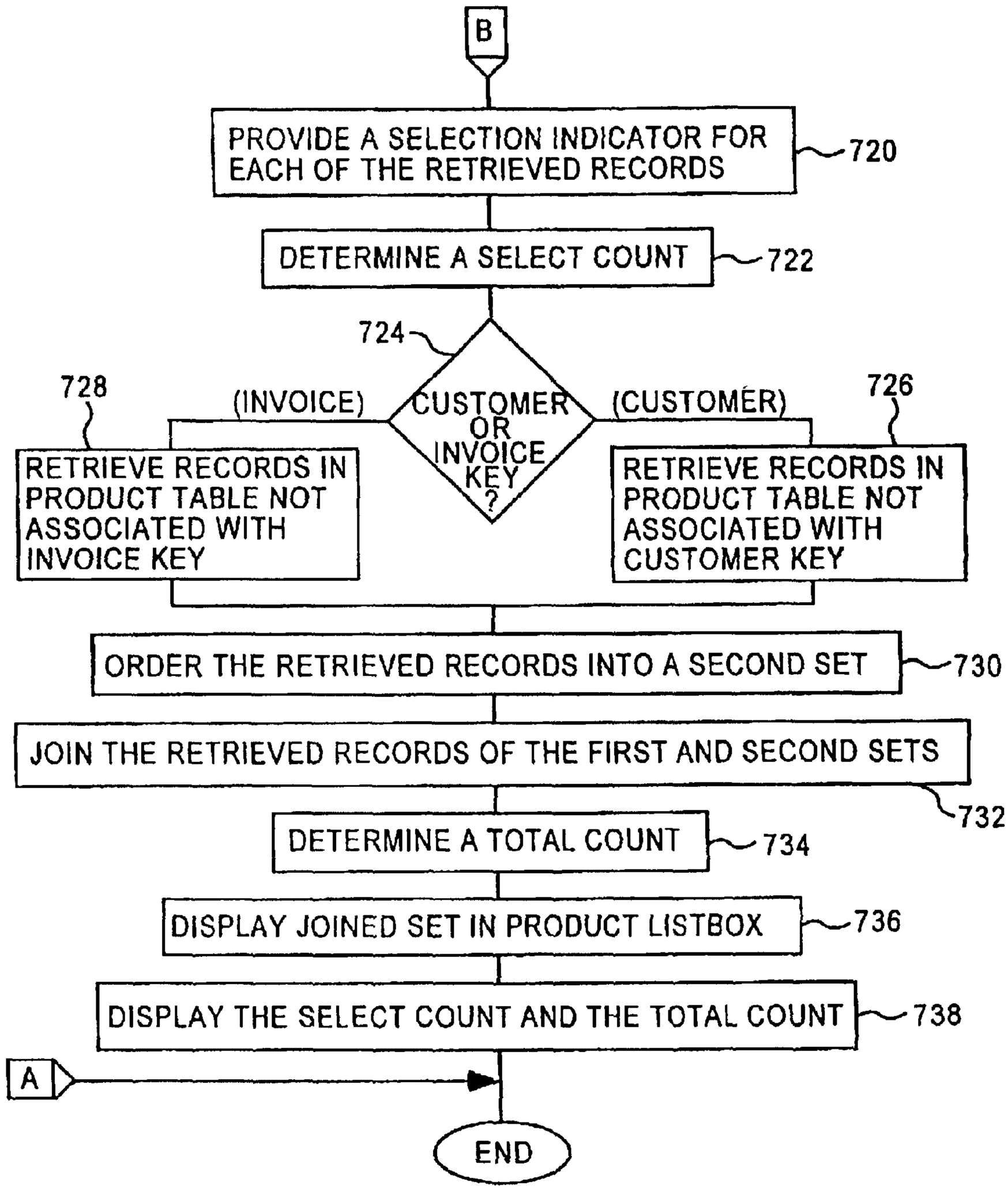

B
PROVIDE A SELECTION INDICATOR FOR EACH OF THE RETRIEVED RECORDS
720
DETERMINE A SELECT COUNT
722
724
CUSTOMER OR INVOICE KEY ?
(INVOICE)
(CUSTOMER)
728
726
RETRIEVE RECORDS IN PRODUCT TABLE NOT ASSOCIATED WITH INVOICE KEY
RETRIEVE RECORDS IN PRODUCT TABLE NOT ASSOCIATED WITH CUSTOMER KEY
ORDER THE RETRIEVED RECORDS INTO A SECOND SET
730
JOIN THE RETRIEVED RECORDS OF THE FIRST AND SECOND SETS
732
DETERMINE A TOTAL COUNT
734
DISPLAY JOINED SET IN PRODUCT LISTBOX
736
DISPLAY THE SELECT COUNT AND THE TOTAL COUNT
738
A
END

FIG. 7B

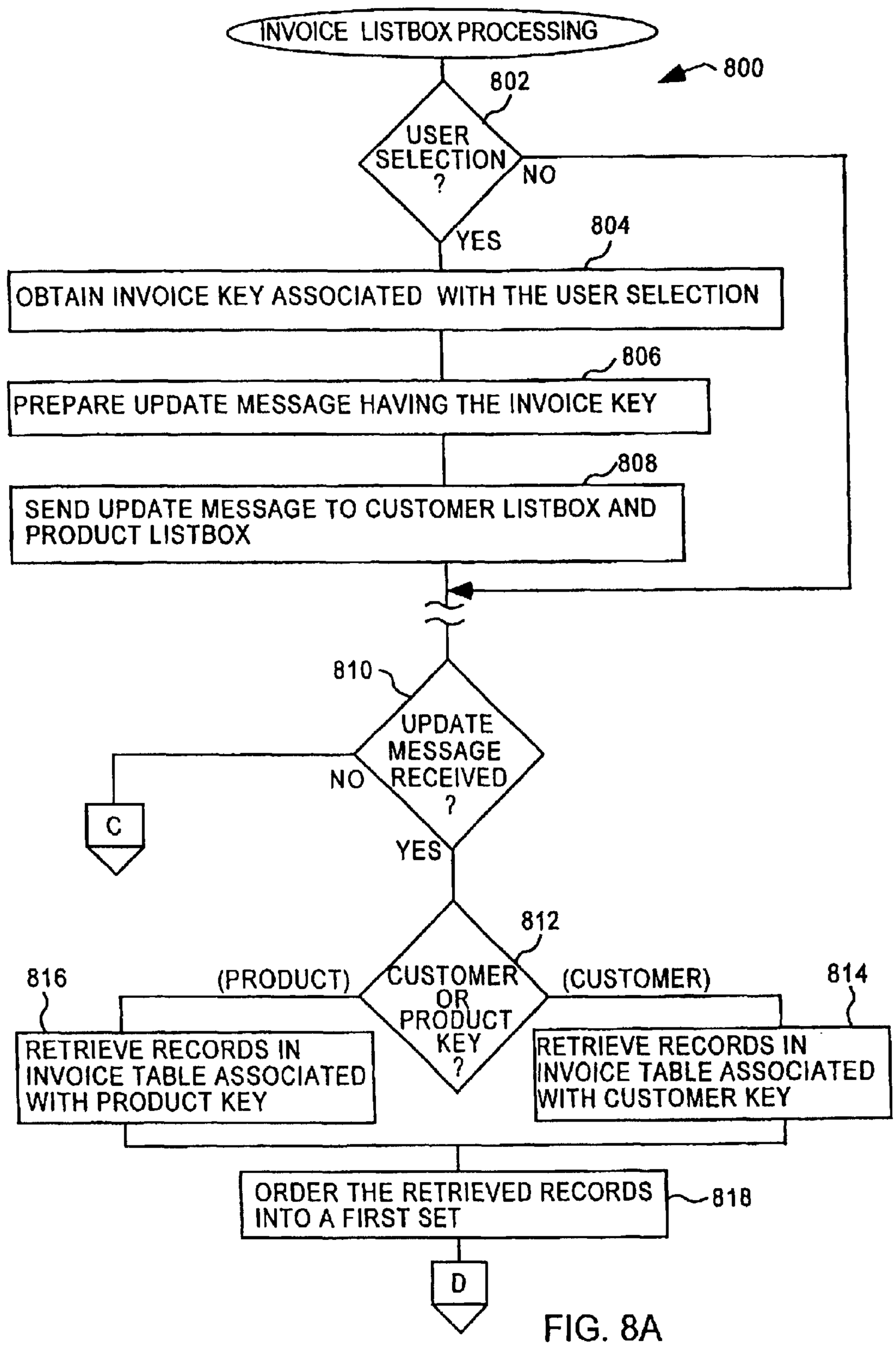

INVOICE LISTBOX PROCESSING
800
802
USER SELECTION ?
NO
YES
804
OBTAIN INVOICE KEY ASSOCIATED WITH THE USER SELECTION
806
PREPARE UPDATE MESSAGE HAVING THE INVOICE KEY
808
SEND UPDATE MESSAGE TO CUSTOMER LISTBOX AND PRODUCT LISTBOX
810
UPDATE MESSAGE RECEIVED ?
NO
C
YES
812
CUSTOMER OR PRODUCT KEY ?
(PRODUCT)
(CUSTOMER)
816
814
RETRIEVE RECORDS IN INVOICE TABLE ASSOCIATED WITH PRODUCT KEY
RETRIEVE RECORDS IN INVOICE TABLE ASSOCIATED WITH CUSTOMER KEY
ORDER THE RETRIEVED RECORDS INTO A FIRST SET
818
D

FIG. 8A

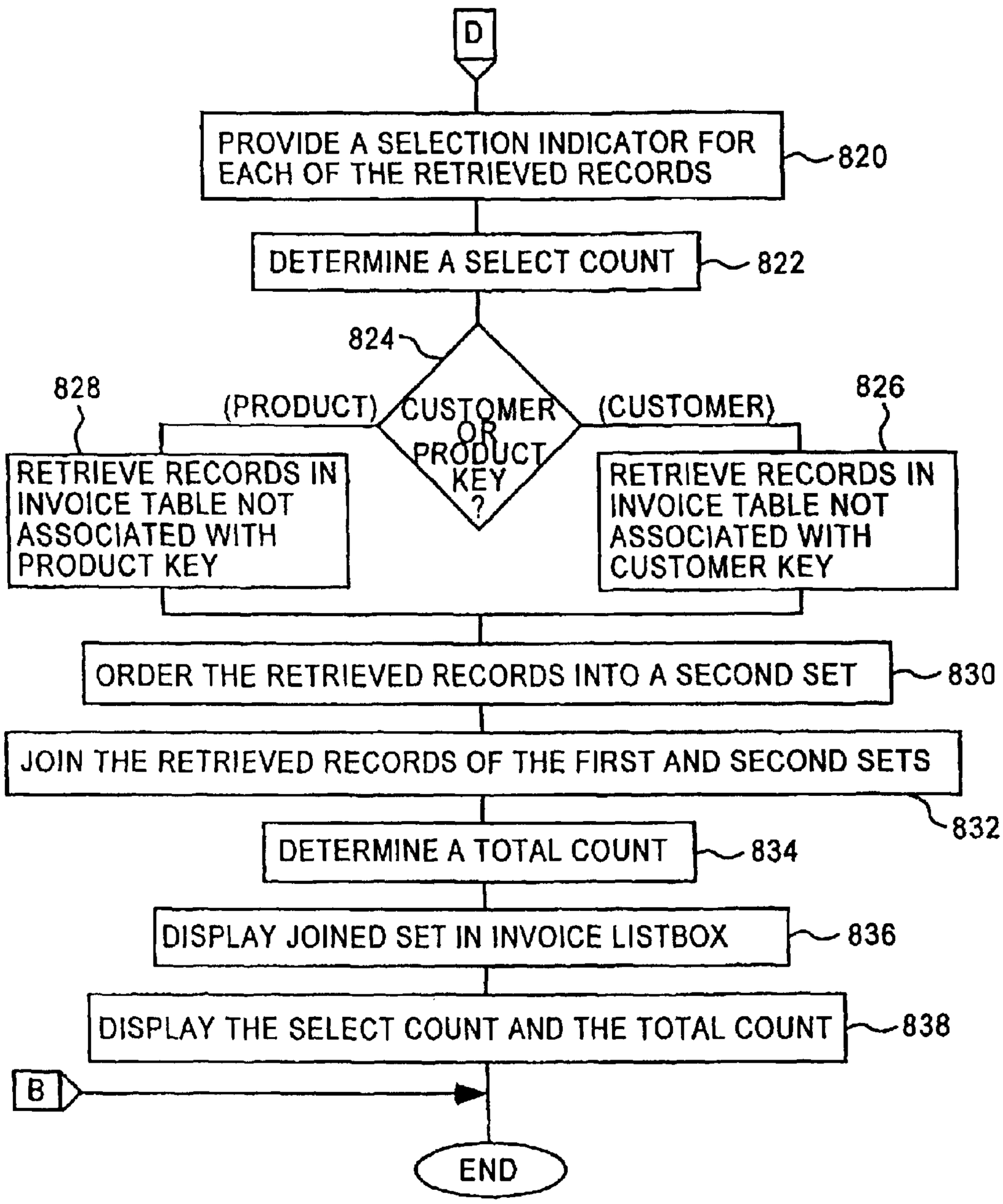

D
PROVIDE A SELECTION INDICATOR FOR EACH OF THE RETRIEVED RECORDS
820
DETERMINE A SELECT COUNT
822
824
CUSTOMER OR PRODUCT KEY ?
(PRODUCT)
(CUSTOMER)
828
826
RETRIEVE RECORDS IN INVOICE TABLE NOT ASSOCIATED WITH PRODUCT KEY
RETRIEVE RECORDS IN INVOICE TABLE NOT ASSOCIATED WITH CUSTOMER KEY
ORDER THE RETRIEVED RECORDS INTO A SECOND SET
830
JOIN THE RETRIEVED RECORDS OF THE FIRST AND SECOND SETS
832
DETERMINE A TOTAL COUNT
834
DISPLAY JOINED SET IN INVOICE LISTBOX
836
DISPLAY THE SELECT COUNT AND THE TOTAL COUNT
838
B
END

FIG. 8B

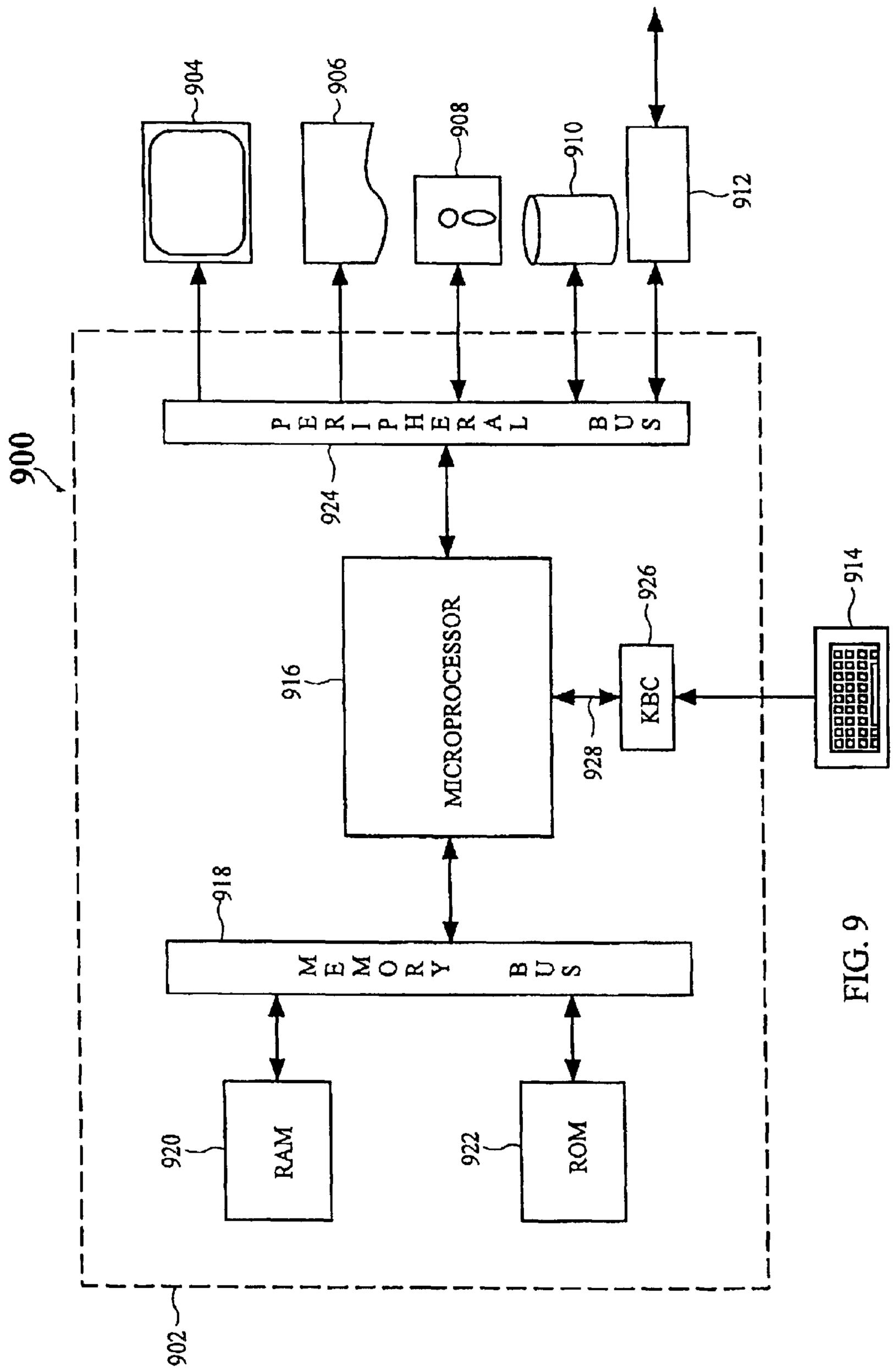

900
904
906
908
910
912
PERIPHERAL BUS
924
MICROPROCESSOR
916
926
KBC
928
914
MEMORY BUS
918
RAM
920
ROM
922
902

FIG. 9

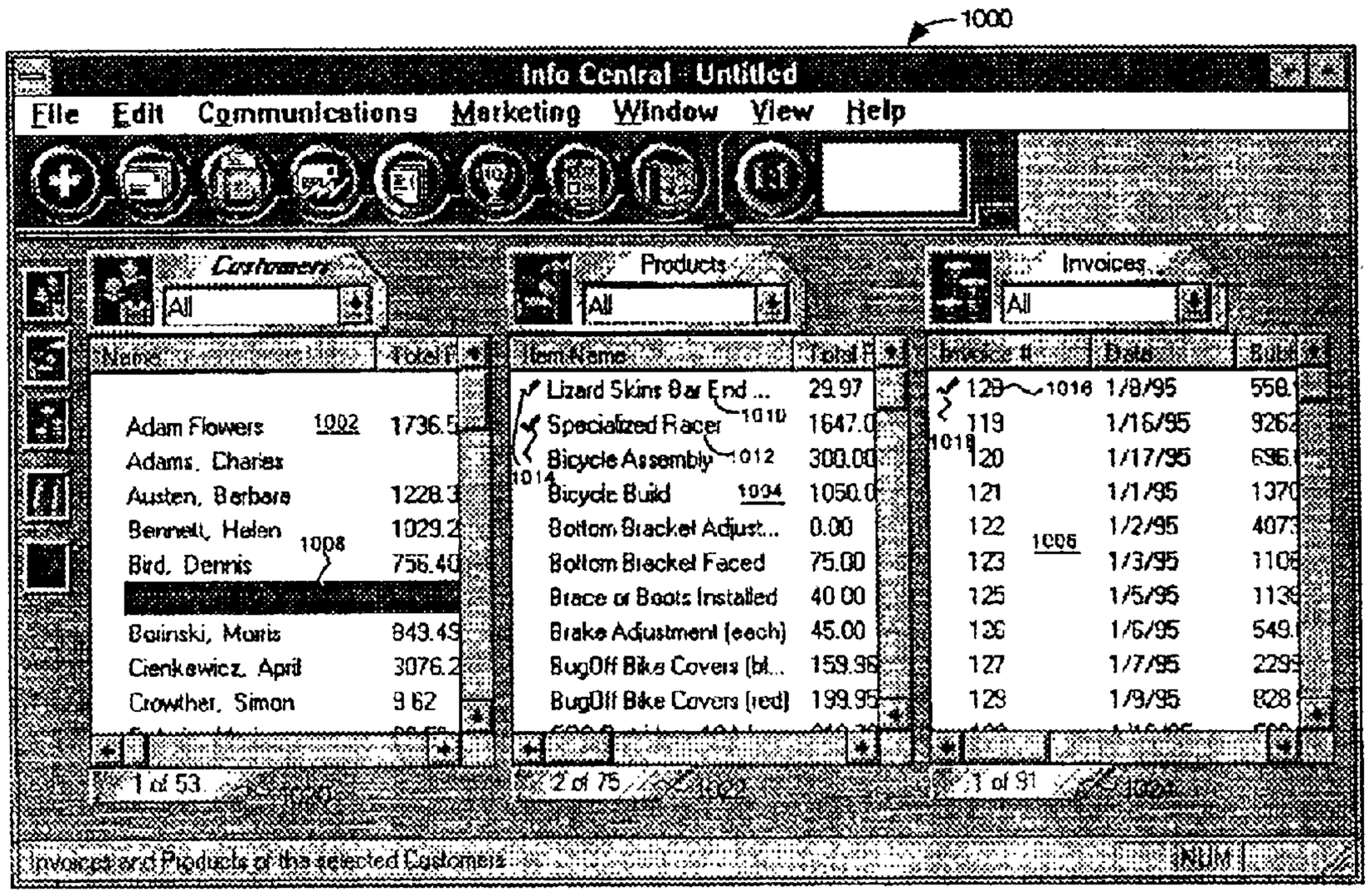

1000
Info Central - Untitled
File Edit Communications Marketing Window View Help
Customers
Products
Invoices
All
Name
Total
Item Name
Invoice #
Date
Adam Flowers 1002
Adams, Charles
Austen, Barbara
Bennett, Helen
Bird, Dennis 1008
Boinski, Morris
Cienkewicz, April
Crowther, Simon
Lizard Skins Bar End ...
Specialized Racer 1010
Bicycle Assembly 1012
Bicycle Build 1004
Bottom Bracket Adjust...
Bottom Bracket Faced
Brace or Boots Installed
Brake Adjustment (each)
BugOff Bike Covers (bl...
BugOff Bike Covers (red)
1014
1016
1018
1006
1 of 53
2 of 75
1 of 91
Invoices and Products of the selected Customers
NUM

FIG. 10

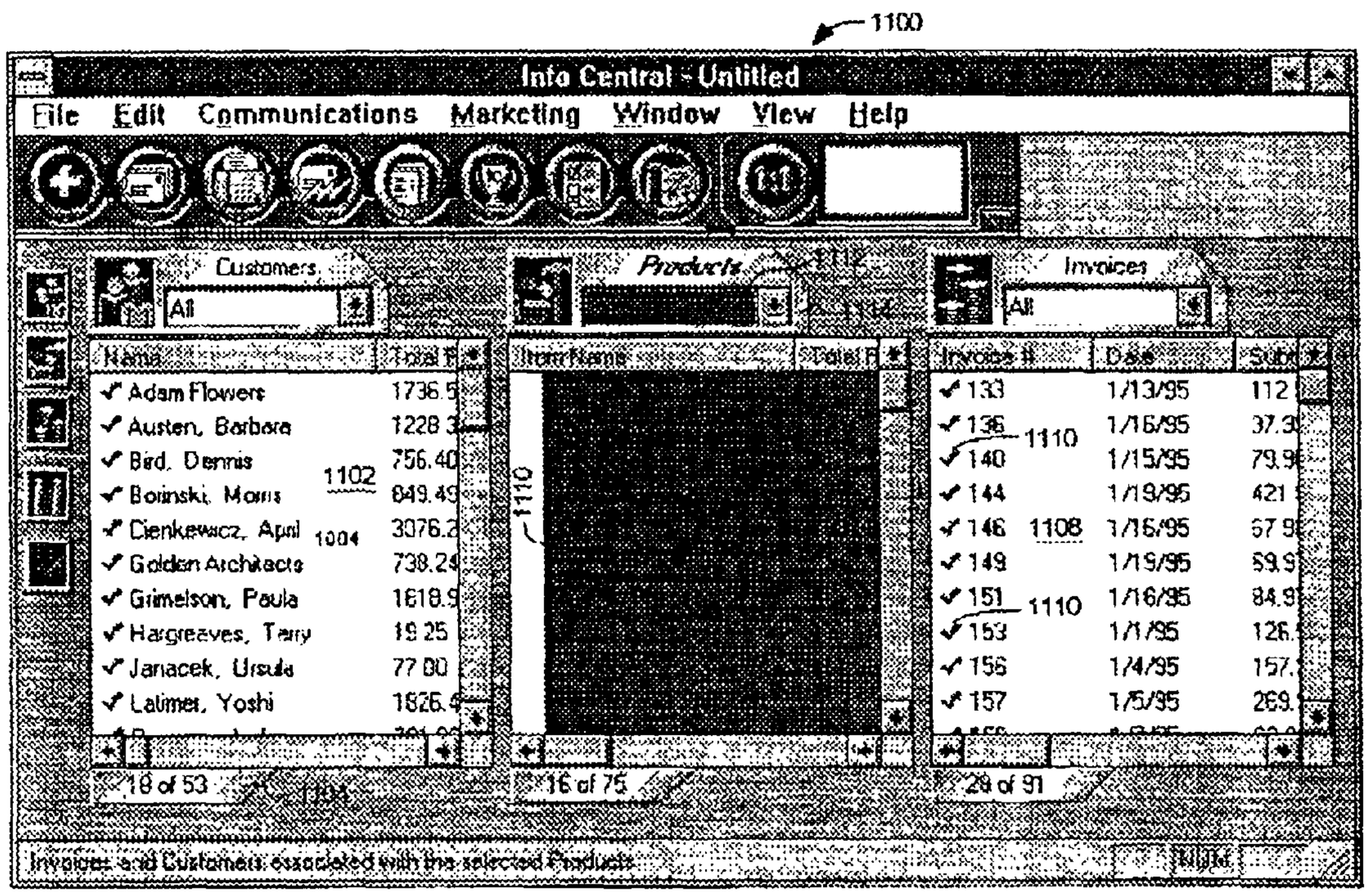

1100
Info Central - Untitled
File Edit Communications Marketing Window View Help
Customers
All
Products
1112
Invoices
All
Name
Total
Item Name
Invoice #
Date
Adam Flowers
Austen, Barbara
Bird, Dennis
Borinski, Morris
Cienkewicz, April
Golden Architects
Grimelson, Paula
Hargreaves, Terry
Janacek, Ursula
Lalimer, Yoshi
1102
1104
1110
1108
133
136
140
144
146
149
151
153
156
157
1/13/95
1/16/95
1/15/95
1/19/95
1/16/95
1/19/95
1/16/95
1/1/95
1/4/95
1/5/95
18 of 53
16 of 75
29 of 91
Invoices and Customers associated with the selected Products

FIG. 11

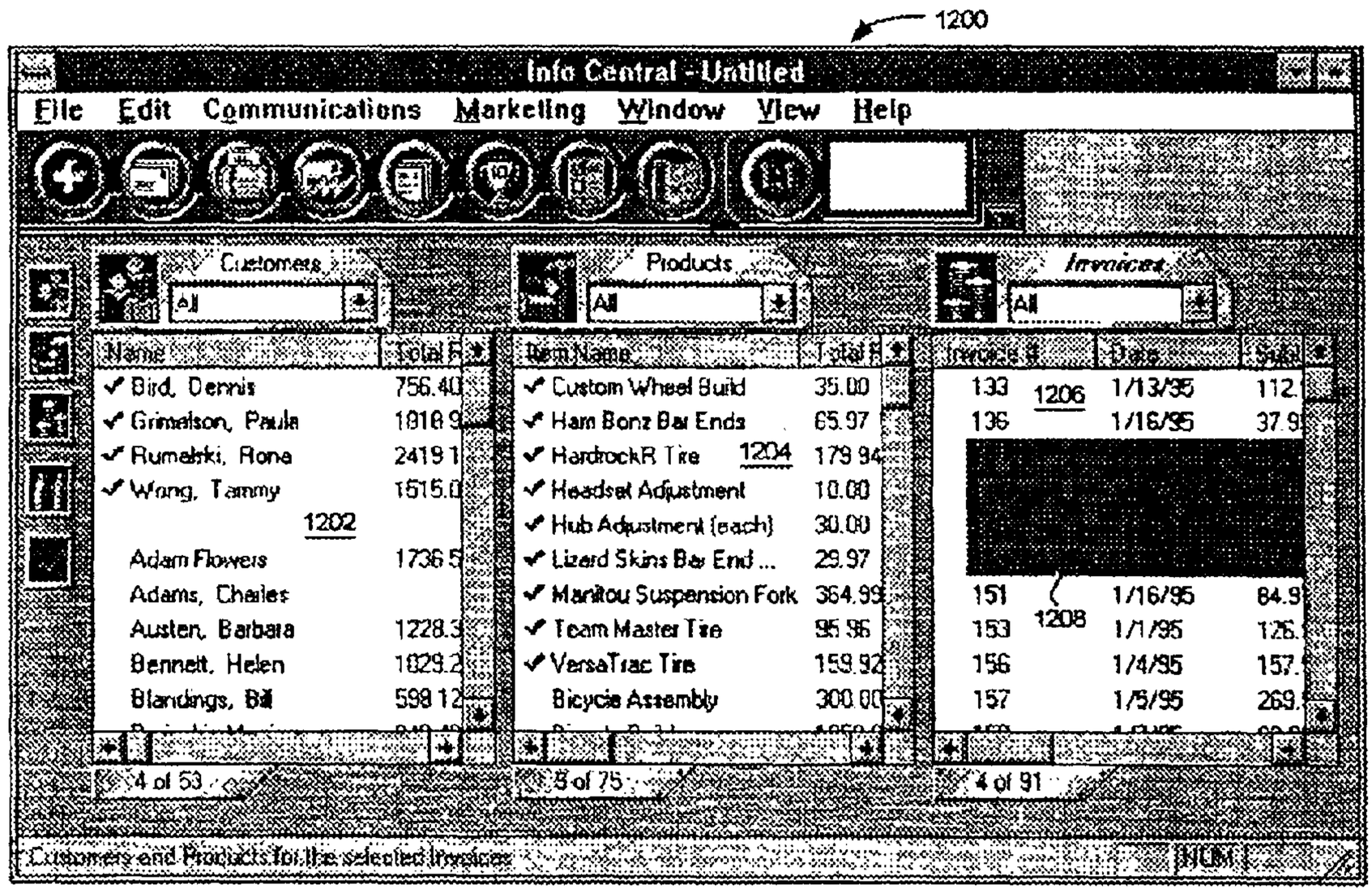

1200
Info Central - Untitled
File Edit Communications Marketing Window View Help
Customers
Products
Invoices
All
Name
Total
Bird, Dennis
Grimelson, Paula
Rumelski, Rona
Wong, Tammy
1202
Adam Flowers
Adams, Charles
Austen, Barbara
Bennett, Helen
Blandings, Bill
4 of 53
Item Name
Custom Wheel Build
Ham Bonz Bar Ends
HardrockR Tire
1204
Headset Adjustment
Hub Adjustment (each)
Lizard Skins Bar End ...
Manitou Suspension Fork
Team Master Tire
VersaTrac Tire
Bicycle Assembly
5 of 75
Invoice #
Date
133
1206
1/13/95
136
1/16/95
151
1208
1/16/95
153
1/1/95
156
1/4/95
157
1/5/95
4 of 91
Customers and Products for the selected Invoices
NUM

FIG. 12

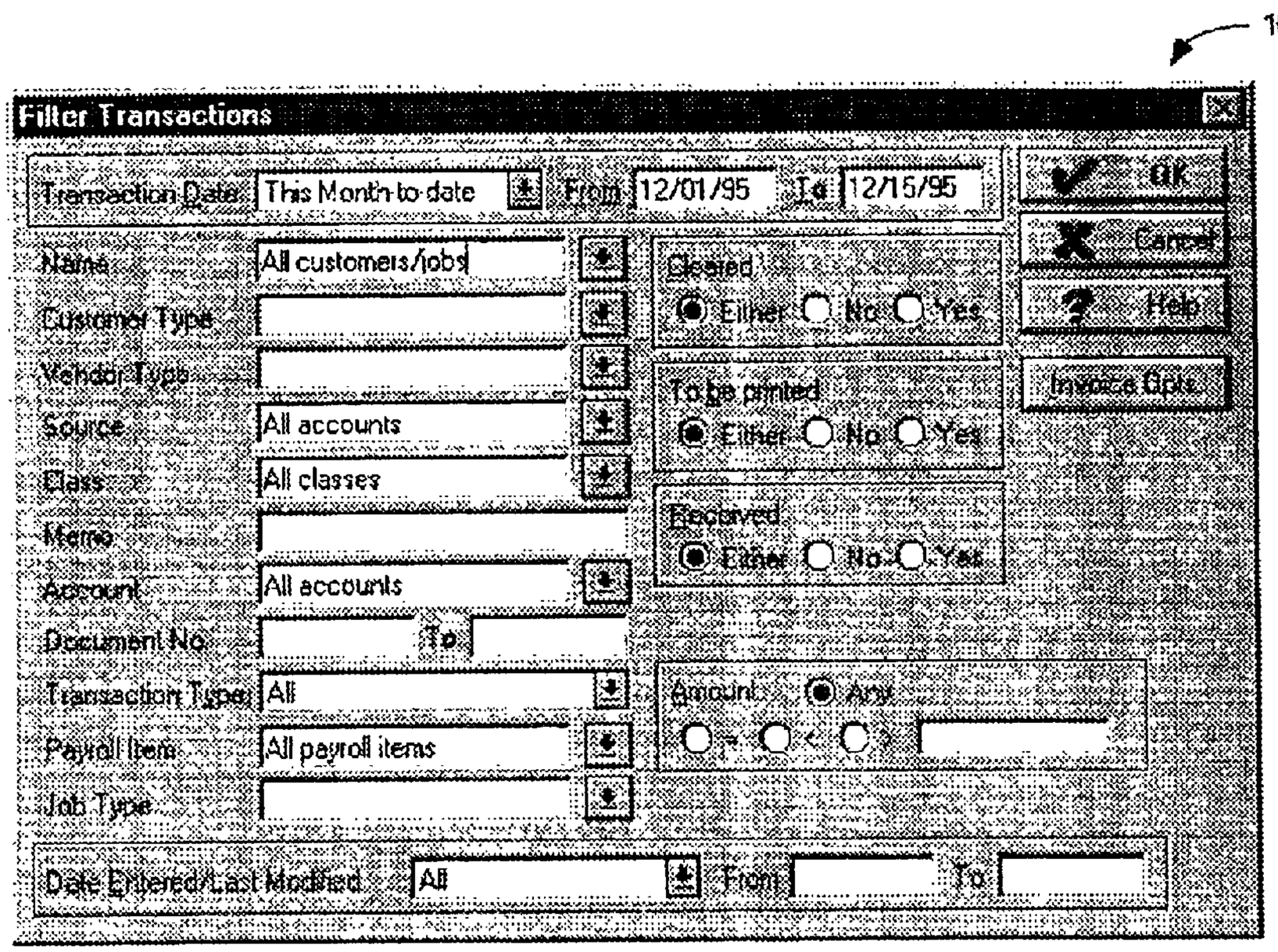

10
Filter Transactions
Transaction Date
This Month to date
From
12/01/95
To
12/15/95
OK
Cancel
Help
Invoice Opts.
Name
All customers/jobs
Customer Type
Vendor Type
Source
All accounts
Class
All classes
Memo
Account
All accounts
Document No
To
Transaction Type
All
Payroll Item
All payroll items
Job Type
Cleared
Either
No
Yes
To be printed
Either
No
Yes
Received
Either
No
Yes
Amount
Any
Date Entered/Last Modified
All
From
To

FIG. 13

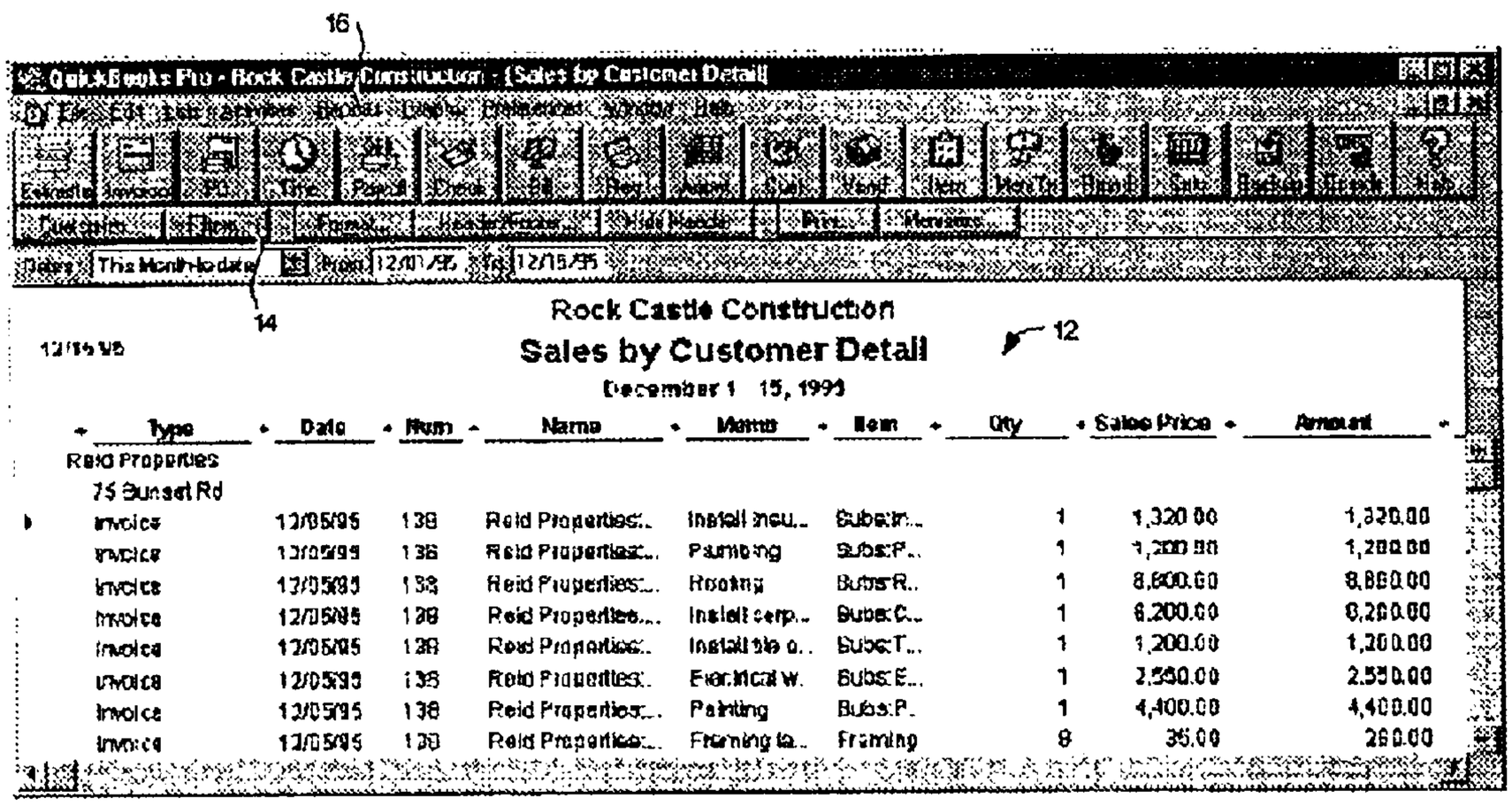

16
14
12
Rock Castle Construction
Sales by Customer Detail
December 1 15, 1995
Type
Date
Num
Name
Memo
Item
Qty
Sales Price
Amount
Reid Properties
75 Sunset Rd
Invoice 12/05/95 138 Reid Properties:.. Install insu.. Subcon... 1 1,320.00 1,320.00
Invoice 12/05/95 136 Reid Properties:.. Plumbing Subcon:P... 1 1,200.00 1,200.00
Invoice 12/05/95 133 Reid Properties:.. Roofing Subcon:R... 1 8,800.00 8,800.00
Invoice 12/05/95 139 Reid Properties:.. Install carp.. Subcon:C... 1 8,200.00 8,200.00
Invoice 12/05/95 139 Reid Properties:.. Install tile o.. Subcon:T... 1 1,200.00 1,200.00
Invoice 12/05/95 139 Reid Properties:.. Electrical w.. Subcon:E... 1 2,550.00 2,550.00
Invoice 12/05/95 138 Reid Properties:.. Painting Subcon:P... 1 4,400.00 4,400.00
Invoice 12/05/95 139 Reid Properties:.. Framing la.. Framing 8 35.00 280.00

FIG. 14

METHOD AND SYSTEM FOR DISPLAYING RELATED INFORMATION FROM A DATABASE

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

This application is a continuation application of prior application Ser. No. 08/732,705 filed on Oct. 18, 1996, now U.S. Pat. No. 5,926,806 the disclosure of which is incorporated herein by reference.

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BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a computer system having a database and, more particularly, to a method and system for displaying related information from a database to a computer system user.

2. Description of the Related Art

Application programs conventionally operate to present data to users in windows on a computer screen. Word-processing applications typically have a single window in which a user creates, views and modifies a document. Some word-processing applications allow two windows (i.e., two pages of a document) to be simultaneously displayed side-by-side. Spreadsheet applications and database applications also tend to interact with a user through a single window. Operating systems, such as Microsoft Windows® (hereafter Windows) and UNIX, have for many years enabled a user to open many different windows on a single computer screen. With Windows, only one of the windows can be active at a time but multiple windows can be viewed so long as no one window utilizes the entire computer screen. With UNIX, multiple windows can also be viewed but multiple windows can be active concurrently. In any event, each window in these examples is largely independent of any other window simultaneously available.

In data management applications, including database development and retrieval applications as well as bookkeeping and accounting programs, data is entered, viewed and modified in accordance with the purposes of the application and the desires of the user. The data is stored by the application in records which form a database. To view the data stored in the database, a query is manually created and then presented to the database to request the particular portion of the data the user is interested in viewing. In response to the query, the appropriate data records are returned from the database. The returned data records are then displayed in a window to the user. However, the manual generation of queries is not only burdensome but also typically restricted to particular tables of the database. Hence, a separate query must be later made to other particular tables of the database to return data records for these other particular tables. The returned data records are normally displayed in or over the window displaying the results of the previous query.

Therefore, the need to use separate queries is very detrimental to one's ability to retrieve and view related information across different tables in the database.

For example, one popular small business management program known as Quickbooks from Intuit, Inc. is able to view or provide reports in certain categories of information. FIG. **13** is a pictorial diagram of an exemplary screen **10** of Quickbooks for a "Filter" configure operation in which certain transactions for a business can be retrieved and placed in a report. The certain transactions are identified by settings for various of the fields shown in the screen **10**. For example, as illustrated in the screen **10**, the transactions selected are those transactions dated from Dec. 1, 1995 to Dec. 15, 1995. Once the filter is configured, a query to a database is made to retrieved desired data for the certain transactions. FIG. **14** illustrates a representative report screen **12** produced by Quickbooks. The reports screen **12** in this example is a report of Sales by Customer Detail for Rock Castle Construction dated Dec. 1-15, 1995. The report screen **12** is organized by invoice data and produced by selecting a filter button **14** to perform the "Filter" configuration, and then by selecting a reports menu **16** to run a report. Hence, Quickbooks is able to produce reports using only those records of its database that meet the criteria set in the filter configuration. Similarly, a "Find" or "List" type operation can be conventionally invoked to retrieve data from the database that meet certain criteria. Although conventional operations will return to the user the records (e.g., invoices) that meet these limitations, there is no way of obtaining or simultaneously displaying the other information (e.g., product and customer information) from the database (namely in other tables) that is related to the invoices identified without having to specifically request the information using these conventional operations. According to these conventional techniques, the user is not able to readily retrieve the desired related information on products or customers for the identified invoices because such information is not in the invoice category. To retrieve such product or invoice information, the user would have to initiate another conventional operation (e.g., "Find," "List" or "Filter" operation) and utilize only those fields made available to the user. Further, only one window is available on the computer screen to display the retrieved information. Hence, invoking another instance of these conventional techniques, eliminates the displayed results of the previous instance. These deficiencies makes it very difficult or impossible to retrieve and display the desired related information.

Thus, there is a need for techniques to provide more effective ways to retrieve and view interrelated information from a database.

SUMMARY OF THE INVENTION

Broadly speaking, the invention is a technique for displaying information from related tables of a database in different display windows on a display system. The different display windows are interlinked such that a selection of one or more entries in one of the display windows causes the other of the display windows to distinguishably display those entries that are related to the selection. An improved graphical interface for utilizing the technique is also provided.

The invention can be implemented in numerous ways, including as a system, a device, a method, or a computer readable medium. Several embodiments of the invention are discussed below.

As a computer system, an embodiment of the invention includes a database containing tables of data, a display

device and a processor unit. The display device has a plurality of display areas, and each of the display areas displays data from an associated table within the database. The processor unit operates to access the database to retrieve the data from the corresponding associated tables and then display the retrieved data in the display areas corresponding thereto, and to detect a selection associated with one of the display areas and thereafter to automatically modify the data being displayed in the other of the display areas in accordance with the selection. Preferably, the selection operates to select at least one data item in the one of the display areas, and the modification of the data operates to display data items in the other of the display area that are related to the selected at least one data item in a graphically distinct manner.

As a graphical user interface for a display screen of a computer, an embodiment of the invention includes a first display area having a first label and a first data window, the first data window displays a first type of data in multiple rows and columns, and the first label identifies the first type of data; and a second display area having a second label and a second data windows the second data window displays a second type of data in multiple rows and columns, and the second label identifies the second type of data. Either a first selection of at least one of the rows in the first data window or a second selection of at least one of the rows in the second data window can be made. When the first selection of at least one of the rows in the first data window occurs, the rows in the second data window that are associated with the first selection are automatically visually distinguished from other of the rows. When the second selection of at least one of the rows in the second data window occurs, the rows in the first data window that are associated with the second selection are automatically visually distinguished from other of the rows. The graphical user interface, of course, can include additional display areas. The graphical user interface may also further include count indicators that are displayed proximate to the corresponding display area.

As a method for displaying data on a display device of a computer system, the data being obtained from a database associated with the computer system, an embodiment of the invention includes: providing the display device with a plurality of display areas, each of the display areas displays data records from an associated table within the database; and interlinking the display areas via the database such that a selection of certain of the displayed data records in one of the display areas causes data records in at least one of the other display areas that are associated with the selection to be identified.

As a method for displaying data on a display device of a computer system, the data being obtained from tables in a database associated with the computer system, the display device having a plurality of display areas, an embodiment of the invention includes the operations of: displaying entries from the database in the display areas; determining whether a selection of one or more entries being displayed in a particular one of the display areas has occurred; obtaining a key from the database in accordance with the selection; notifying the other of the display areas of the key; and updating the entries in the other of the display areas so as to visually distinguish those of the entries that are associated with the key with those entries that are not associated with the key.

As a computer readable media containing program instructions for displaying data on a display device of a computer system, with the data being obtained from tables in a database associated with the computer system, and the display device having a plurality of display areas, an embodiment of the invention includes: first computer readable code devices for determining whether a selection of one or more entries being displayed in a particular one of the display areas has occurred; second computer readable code devices for obtaining a key from the database in accordance with the selection; third computer readable code devices for notifying the other of the display areas of the key; and fourth computer readable code devices for updating the entries in the other of the display areas so as to visually distinguish those of the entries that are associated with the key from those entries that are not associated with the key.

The advantage of the invention are numerous. One advantage of the invention is that a user is able to obtain and view on a display screen information within a database related to a selection by the user with minimal user effort and frustration. As a result, the user is able to more efficiently and effectively review related information than conventionally possible.

Other aspects and advantages of the invention will become apparent from the following detailed description, taken in conjunction with the accompanying drawings, illustrating by way of example the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be readily understood by the following detailed description in conjunction with the accompanying drawings, wherein like reference numerals designate like structural elements, and in which:

FIG. **1** is a pictorial diagram of a main screen according to an embodiment of the invention;

FIG. **2** is a block diagram of a system arrangement according to an embodiment of the invention;

FIG. **3** is a database according to an embodiment of the invention;

FIG. **4** is a flow digram of initializing processing according to an embodiment of the invention;

FIGS. **5**A and **5**B are flow diagrams illustrating select and update processing according to a basic embodiment of the invention;

FIGS **6**A and **6**B are flow diagrams of customer list box processing according to an embodiment of the invention;

FIGS. **7**A and **7**B are flow diagrams of product list box processing according to an embodiment of the invention;

FIGS. **8**A and **8**B are flow diagrams of invoice list box processing according to an embodiment of the invention;

FIG. **9** is a block diagram of an exemplary computer system for carrying out the processing according to the invention;

FIGS. **10**-**12** are pictorial diagrams of a main screen illustrating operations of embodiments of the invention; and

FIGS. **13** and **14** are pictorial diagrams of an exemplary screens of a conventional software package known as Quickbooks.

DETAILED DESCRIPTION OF THE INVENTION

The invention pertains to a technique for displaying information from related tables of a database in different display windows on a display screen associated with a computer system. The different display windows are interlinked such that a selection of one or more entries in one of the display windows causes the other of the display windows to distinguishably and orderly display those entries that are related to the selection. The invention also pertains to a graphical user interface (GUI in which a main screen is produced having the different display windows that are interlinked.

FIG. **1** is a pictorial diagram of a main screen **100** according to an embodiment of the invention. The main screen **100** is displayed on a display screen associated with a computer system. Hence, the main screen **100** operates as a graphical user interface (GUI) for a user of the computer system.

The main screen **100** includes the menu **102**, a tool bar **104**, and an information display region **106**. The information display region **106** includes a first display area **108**, a second display area **110** and a third display area **112**. As explained in detail below, the first, second and third display areas **108**, **110** and **112** are interlinked such that selections in any of the display areas invoke automatic modifications to the other of the display areas. By interlinking display areas in this manner, related information being displayed in the display areas can be readily identified.

The first display area **108** includes a first information area **114** and a list box **116**. The first information area **114** includes a label plate **118**, a full-size button **120**, and a group drop down list box **122**. The list box **116** is a multicolumn list box. The list box **116** lists or otherwise displays multiple entries with a row and column format. The list box **116** includes column headings **124** and **126** (as well as other column headings that are not illustrated in FIG. **1** partly because the size of the list box **116** is less than its maximum size) which provide labels for the columns of the list box **116**. The first display area **108** also includes a count plate **128** placed at the lower portion of the list box **116**. The count plate **128** displays or otherwise indicates a number of selected entries within the list box **116** as well as a number of total entries within the list box **116**.

The second display area **110** includes a second information area **130** and a list box **132**. The second information area **130** includes a label plate **134**, a full-size button **136**, and a group drop down list box **138**. The list box **132** is a multicolumn list box. The list box **132** includes column headings **140** and **142** (as well as other column headings that are not illustrated in FIG. **1** because the size of the list box **132** is less than its maximum size) which provide labels for the columns of the list box **132**. The list box **132** lists or otherwise displays multiple entries with a row and column format. The second display area **110** also includes a count plate **144** placed at the lower portion of the list box **132**. The count plate **144** displays or otherwise indicates a number of selected entries in the list box **132** as well as the number of total entries within the list box **132**.

The third display area **112** includes a third information area **146** and a list box **148**. The third information area **146** includes a label plate **150**, a full-size button **152**, and a group drop down list box **154**. The list box **148** is a multicolumn list box. The list box **148** includes column headings **156**, **158** and **160** (as well as other column headings that are not illustrated in FIG. **1** because the size of the list box **148** is less than its maximum size) which provide labels for the columns of the list box **148**. The list box **148** lists or otherwise displays multiple entries with a row and column format. The third display area **112** also includes a count plate **162** placed at the lower portion of the list box **148**. The count plate **162** indicates a number of selected entries in the list box **148** as well as a number of total entries within the list box **148**.

The information display region **106** further includes a secondary button area **164**. Within the secondary button area **164**, numerous buttons are provided for additional features. In particular, toggle buttons **166**, **168** and **170** are provided to toggle the list boxes **116**, **132** and **148** between on and off states. As illustrated in FIG. **1**, all the list boxes **116**, **132** and **148** are in their on state. However, if, for example, one of the toggle buttons **116**, **132** or **148** were activated, then the associated list box would be switched to an off state and the remaining list boxes remaining in the on state would preferably expand to fill the screen space vacated by the list box that has been switched to the off state. The secondary button area **164** further includes a detail button **172** that launches a detailed mode (detailed screen) for the selected one of the categories for the selected display area. The list boxes **116**, **132** and **148** in FIG. **1** are illustrated in view mode wherein data can be viewed in the various list boxes. In the detailed mode (not shown) data can be entered or modified, whereas in the view mode data is viewed. A check button **174** may also provided in the secondary button area **164** to deactivate the interlinking of the display areas **108**, **110** and **112** (i.e., list boxes **116**, **132** and **148**).

An exemplary embodiment pertains to use of the invention in the context of a small business application program that executes on a computer system. In this regard, the main screen **100** illustrated in FIG. **1** is associated with such a small business application program. The default set-up preferences for the main screen **100** in the view mode are illustrated in FIG. **1** and are useful for a typical small business. Namely, the first display area **108** pertains to customers, the second display area **110** pertains to products/services, and the third display area **112** corresponds to invoices. Further, in the exemplary embodiment, the tool bar **104** of the main screen **100** enables a user to perform common marketing and communication functions. In particular, the icon buttons illustrated in the main tool bar **104** from left to right are as follows: an add button can be used to create a customer, product/service or invoice, a letters button can be used to create letters, a fax button can be used to send faxes, an e-mail button can be used to send e-mail, a reports button can be used to generate reports, a top-ten report button can be used to create a top-ten report, a to-do-button can be used to bring up a to-do dialog, an introductory button can be used to perform an introductory task such as training the user to perform tasks for a typical small business, and a module button can be used to activate any of a number of modules that are initially provided with the system or later added, such as a marketing advisor and a futures module.

FIG. **2** is a block diagram of a system arrangement **200** according to an embodiment of the invention. The system arrangement **200** includes hardware and software features used implement the operations performed by the invention. The system arrangement **200** is provided within a computer system. An exemplary computer system is described below with reference to FIG. **9**.

The system arrangement **200** includes a list box-**1** process **202**, a list box-**2** process **204** and a list box-**3** process **206**. These list box processes **202**, **204** and **206** respectively correspond to the list boxes **116**, **132** and **148** illustrated in FIG. **1**. In this regard, the list box-**1** process **202** performs the processing necessary to produce the appropriate data within the list box **116**; the list box-**2** process **204** performs the processing necessary to produce the appropriate data within the list box **132**; and the list box-**3** process **206** performs the processing necessary to produce the appropriate data within the list box **148**. Although the list box processes **202**, **204** and **206** are illustrated as separate processes, these processes can be implemented by a single process or block of executable computer instructions, or by multiple processes or multiple threads.

The system arrangement **200** also includes user selections **208**, **210** and **212** and a database **214**. The user selections **208**, **210** and **212** are selections of one or more entries in the list boxes **116**, **132** and **148**, respectively. As an example, the

user selections can be achieved with a pointing device. More particularly, with respect to the list box-**1** process **202**, a user selection **208** will result from a user selecting one or more of the entries within the list box **116**. The user can also select a group of the entries within the list box **116** by using the group drop down list box **122**. As an example, the group drop down list box **122** could contain group designators such as "All" (the illustrated group in FIG. **1**), "Frequent Buyers," or "Retailers." The group designators will vary with the list boxes as well as with the type of application. After one or more of the entries within the list box **116** have been selected by the user selection **208**, the list box-**1** process **202** will obtain a key from the database **214**. Using the key, the list box processes **204** and **206** together with the database **214** operate to retrieve, order and display the appropriate entries in the list boxes **132** and **148**. Those of the entries that are associated with the user selection **208** are distinguishably displayed from the other entries in the list boxes **132** and **148**. The processing performed by the invention is described in greater detail below.

FIG. **3** is a database **300** according to an embodiment of the invention. As an example, the database **300** is suitable for use as the database **214** illustrated in FIG. **2**. The database **300** includes primary tables and secondary tables. The primary tables include a customer table **304**, a product table **306** and an invoice table **308**. The secondary tables include an invoice item table **310**, a customer to group mapping table **312**, an invoice to group mapping table **314**, a product to group mapping table **316**, and a group name table **318**. The invoice item table **310** acts as an intermediary table that relates invoice keys to product keys. Hence, when relating customer keys to product keys, the invoice item table may be used as an intermediary to facilitate the conversion. The secondary tables **312**, **314**, **316** and **318** are used to operate with group selections. The group selections can be performed by any of the group drop down list boxes **122**, **138** and **154** of the main screen **100** illustrated in FIG. **1**.

FIG. **4** is a flow diagram of initializing processing **400** according to an embodiment of the invention. The initialization processing **400** is performed to initially fill the list boxes **116**, **132** and **148** illustrated in FIG. **1**. Depending on the implementation, the initialization processing **400** can be performed by the list box processes **202**, **204** and **206** illustrated in FIG. **2** or by some other separate process or processes. Initially, the main screen **100** with the menu **102**, the tool bar **104** and the group drop down list boxes **122**, **138** and **154**, and list boxes **116**, **132** and **148** are displayed (**402**). Next, column headings (e.g., column headings **124**, **126**, **140**, **142**, **156**, **158** and **160**) for each of the list boxes **116**, **132** and **148** are provided (**404**). Then, records to be displayed in the list boxes **116**, **132** and **148** are retrieved from the appropriate tables in the database **214**, **300** (**406**). The records are retrieved using queries to the database **214**, **300**. Also, records (i.e., group names) to be displayed in the group drop down list boxes **122**, **138** and **154** are retrieved from the appropriate table in the database **214**, **300** (**408**). For example, the group names can be retrieved by queries to the group name table **318** of the database **214**, **300**. Following block **408**, the initialization processing **400** is complete and ends.

FIGS. **5**A and **5**B are flow diagrams illustrating select and update processing **500** according to a basic embodiment of the invention. The select and update processing **500** can be performed by the list box processes **202**, **204** and **206** illustrated in FIG. **2** or by some other separate process or processes.

The select and update processing **500** begins with a decision block **502** that determines whether a user selection has been received. The user selection involves the user selecting one or more entries in one of the list boxes **116**, **132** and **148**. If a user selection has been received, then a key associated with the user selection is obtained **504**. The key represents the user selection in the database **214**, **300**. Then, an update message having the key is prepared **506**. Next, the update message is sent **508** to the other of the list boxes. On the other hand, if the decision block **502** determines that no user selection has been made, then blocks **504**-**508** are bypassed.

Thereafter, following block **508** or following block **502** when no user selection has been made, a decision block **510** determines whether an update message has been received. The select and update processing **500** can be viewed as having a select processing portion which is that processing prior to block **510** and an update processing portion which begins at block **510**. If an update message has been received, a first set of records to be displayed in the associated list box are retrieved **512**. The first set of records are retrieved **512** from an appropriate table in the database **214**, **300** that is associated with the key that accompanies the update message. Then, the first set of the retrieved records are selected, sorted, and then displayed **514** in the associated list box as the first part of the displayed records. A second set of records to be displayed in the associated list box are also retrieved **516**. These records are retrieved **516** from an appropriate table in the database **214**, **300** but are not associated with the key that accompanies the update message. Next, the second set of retrieved records are unselected, sorted and then displayed **518** in the associated list box as a second part of the displayed records. Thereafter, a select count and a total records count for the associated list box are updated and displayed **520** proximate to the associated list box. Following block **520** in the case in which an update message is received, as well as following block **510** in the case in which no update message is received, the select and update processing **500** is complete and ends.

An example of the operation of the invention is now described for the selected update processing **500** illustrated in FIGS. **5**A and **5**B with reference to FIGS. **1**-**4**.

Initially, a main screen is set-up according to the initialization processing **400** illustrated in FIG. **4**. As an example, once set-up, the main screen may appear similar to the main screen **100** illustrated in FIG. **1**, at least in the case of the exemplary embodiment. A user then starts the select and update processing **500** by selecting one or more entries being displayed in one of the list boxes **116**, **132** and **148** of the main screen **100**. After the user selection has been made, the key associated with the user selection is obtained **504** from the database **214**, **300**. In the exemplary embodiment, the key may be a customer key, a product/service key or an invoice key. Next, an update message having the key is sent **508** to the other of the list boxes. At this point, the selection has been processed and now the list boxes **116**, **132** and **149** are updated in accordance with the selection.

In updating the list boxes **116**, **132** and **148**, the list box receiving the selection highlights the user selection, and the other of the list boxes process the update message they receive. The update message informs these other list boxes that they need to update the information they display. The update to each of the other list boxes is generally performed as follows. First, a first set of records are retrieved **512** from the table in the database **214**, **300** that is associated with the key. With respect to FIGS. **1** and **3**, the list box **116** is associated with the customer table **304**, the list box **132** is associated with the product table **306**, and the list box **148** is associated with the invoice table **308**. After the first set of records is retrieved, the retrieved records are selected, sorted

and displayed in the associated list box. The selection of these retrieved records is performed so that they will be distinguishably displayed from other records to be display in the associated list box. The sorting of the retrieved records operates to reorder the retrieved records based on a predetermined sort criteria. The subsequent display of the selected and sorted retrieved records displays the retrieved records in the associated list box such that they are indicated (i.e., distinguishably displayed) to the user as being associated with the user selection.

Next, a second set of records are retrieved **516** from the table in the database **214**, **300** that is associated with the key. The retrieved records are then unselected, sorted and displayed **518** in the associated list box. The unselection of these retrieved records is performed in this embodiment so that they will not be distinguishably displayed as selected records (even if previously displayed as selected), but other embodiments may not need to perform such unselection. The sorting of the retrieved records of the second set operates similar to the sorting of the first set. The subsequent display of the unselected and sorted retrieved records displays the retrieved records in the associated list box such that there is no indication to the user that these records are associated with the user selection because these records are in fact not associated with the user selection. Hence, the first and second sets of records are displayed in the associated list box, preferably the second set follows the first set. Finally, a select count and a total count can also be displayed. Preferably, the select count and the total count are displayed **520** in a count plate proximate to the list box.

FIG. **10** is a pictorial diagram of a main screen **1000** illustrating operation of an embodiment of the invention. Specifically, FIG. **10** illustrates the display results for a specific instance of the previously described example. The main screen **1000** has list boxes **1002**, **1004** and **1006** which correspond respectively to the list boxes **116**, **132**, and **148**, of FIG. **1**. Here, the user selection occurred in the list box **1002** pertaining to customer information. Namely, the user selected record **1008** containing information about customer "Blandings, Bill" and is so identified by being highlighted. Then, according to the invention, the other list boxes **1004** and **1006** are automatically modified such that they visually indicate those records that are related to the user selection. Here, in the list box **1004** pertaining to product information, the records **1010** and **1012** are related to the user selection (i.e., first set of retrieved records) and are thus sorted (in this example alphabetically) and placed at the top of the list box **1004** before those records that are not related to the user selection (i.e., second set of retrieved records). These records **1010** and **1012** are also visually indicated as being related to the user selection by check-mark graphic images **1014** placed adjacent to these records **1010** and **1012** within the list box **1004**. In the list box **1006** pertaining to invoice information, the record **1016** is the only record related to the user selection. The record **1016** is thus placed at the top of the list box **1006** before any of the other records. Although no sorting need occur with a single record, in general, the sorting would normally be numerically be invoice number or date in the list box **1006** that pertains to invoice information. The record **1016** is also given a check-mark graphic image **1018** to visually indicate that it is related to the user selection. Moreover, each of the list boxes **1002**, **1004** and **1006** includes a count plate **1020**, **1022** and **1024**, respectively, for displaying the respective select count and total count. For example, the count plate **1022** displays "2 of 75", which means that two (2) records are selected out of a total of seventy-five (75) records.

Alternatively, the select and update processing **500** could operate differently in other embodiments. For example, one such embodiment could operate to manipulate (reorder and select) the records or entries of the existing lists within the list boxes without having to access the database **214**, **300** to obtain these records. The ad vantage would be a speed improvement for the updating, but the disadvantages are increased memory utilization and use of possibly stale data.

FIGS. **6**A-**8**B are flow diagrams illustrating processing associated with a more detailed embodiment of the invention. These flow diagrams assume that the system arrangement of the processing follows the system arrangement **200** of FIG. **2**. However, it should be recognized that the system arrangement **200** is primarily conceptual as numerous implementations with different arrangements are possible. For example, all the processing could be done within a single process. In any case, the discussion of FIGS. **6**A-**8**B assumes the system arrangement **200** of FIG. **2**.

FIGS. **6**A and **6**B are flow diagrams of customer list box processing **600** according to an embodiment of the invention. The customer list box processing **600** is preferably performed by the list box-**1** process **202** illustrated in FIG. **2** which is in turn performed by a computer system having a display screen for displaying information to a user and a user input device for receiving input from the user. An exemplary computer system is described below with reference to FIG. **9**.

The customer list box processing **600** begins with a decision block **602** that determines whether a user selection has been made. The user selection is, for example, achieved by the user input device of the computer system. Since the customer list box processing **600** pertains to the customer list box **116**, the user selection is of one or more customer records. When the decision block **602** determines that a user selection has been made, the customer list box processing **600** proceeds to perform blocks **604**-**608**. On the other hand, when the decision block **602** determines that no user selection has been made, the blocks **604**-**608** are bypassed.

Once the user selection has been made, a customer key associated with the user selection is obtained **604**. In the exemplary embodiment, the customer key is obtained **604** by accessing the customer table **304** to retrieve the customer key associated with the user selection. Then, an update message having the customer key is prepared **606**. An example of an update message is "MESSAGE_RefreshProductList". The update message that has been prepared is then sent **608** to the product list box **132** and the invoice list box **148**. In the exemplary embodiment, the forwarding of the update message can be achieved by "SendMessage (MESSAGE_RefreshCustomerList);" in the case of Windows.

Following block **608** directly or following the decision block **602** in the case in which no user selection occurred, a decision block **610** determines whether an update message has been received. At this point, the customer list box processing **600** shifts to a message processing mode, whereas previously, the customer list box processing **600** was in a message generation mode. Although these two modes are described with respect to a single flow diagram, it should be recognized that these different modes could be separate processes, threads or objects. In any event, when the decision block **610** determines that no update message has been received, the customer list box processing **600** is complete and ends.

On the other hand, when the decision block **610** determines that an update message has been received, the customer list box processing **600** proceeds to process the

incoming update message. A decision block **612** determines whether the update message has either a product key or an invoice key associated therewith. If the update message has a product key associated therewith, then records in the customer table **304** associated with the product key are retrieved **614**. On the other hand, if the update message received has an invoice key associated therewith, then records in the customer table **304** associated with the invoice key are retrieved **616**. Following either block **614** or block **616**, the retrieved records are ordered **618** into a first set. In one embodiment, the ordering **618** sorts the records in accordance with a predetermined criteria. Here, in the customer list box processing, the records are customer records; hence, an alphabetical sorting is used (see, e.g., list box **116** in FIG. **1**). Then, a selection indicator for each of the retrieved records is provided **620**. The selection indicator operates to distinguishably display the retrieved records of the first set. The selection indicator is a visual indication to the user that is provided for each of the retrieved records of the first set to thereby visually indicate those records as being associated with the user selection. As an example, the selection indicator can be a check-mark graphic image such as illustrated in FIG. **10**. A select count is also determined **622**. The select count is the count of the retrieved records in the first set.

A decision block **624** then determines whether the update message being processed has a product key or an invoice key. If the update message has the product key, records in the customer table **304** not associated with the product key are retrieved **626**. On the other hand, if the update message has the invoice key, records in the customer table not associated with the invoice key are retrieved **628**. Following either block **626** or **628**, the retrieved records are ordered **630** into a second set. In one embodiment, the ordering **630** sorts the records in accordance with a predetermined criteria.

Next, the retrieved records of the first and second sets are joined **632**. The resulting joined set is the list of records that are displayed. The joining set is then displayed **636** in the customer list box. Note the same records can be displayed by displaying the joined set or by displaying the first set followed by the second set. A total count is also determined **634**. The total count is the count of the number of records in the joined set. Also, the select count and the total count are displayed **638**. Following block **638**, the customer list box processing **600** is complete and ends.

FIG. **11** is a pictorial diagram of a main screen **1100** illustrating operation of embodiment of the invention. Specifically, FIG. **11** illustrates among other things the display results for a specific instance of the customer list box processing **600**. Here, the customer list box **1102** displays eighteen (18) selected customers with the check-mark graphic image adjacent thereto. In this case, the records of the first set completely fill the list box **1102** being illustrated. Also note that each of the records in the first set are sorted in alphabetical order. The associated count plate **1104** for the customer list box **1102** indicates that eighteen (18) of fifty-three (53) total records are selected.

FIGS. **7**A and **7**B are flow diagrams of product list box processing **700** according to an embodiment of the invention. The product list box processing **700** is preferably performed by the list box-**2** process **204** illustrated in FIG. **2** which is in turn performed by a computer system having a display screen for displaying information to a user and a user input device for receiving input from the user. An exemplary computer system is described below with reference to FIG. **9**.

The product list box processing **700** begins with a decision block **702** that determines whether a user selection has been made. The user selection is, for example, achieved by the user input device of the computer system. Since the product list box processing **700** pertains to the product list box **132**, the user selection is of one or more product records. More generally, the product records may be product or service records. When the decision block **702** determines that a user selection has been made, the product list box processing **700** proceeds to perform blocks **704-708**. On the other hand, when the decision block **702** determines that no user selection has been made, the blocks **704-708** are bypassed.

Once the user selection has been made, a product key associated with the user selection is obtained **704**. In the exemplary embodiment, the product key is obtained **704** by accessing the product table **306** to retrieve the product key associated with the user selection. Then, an update message having the product key is prepared **706**. An example of an update message is "MESSAGE_RefreshCustomerList". The update message that has been prepared is then sent **708** to the customer list box **116** and the invoice list box **148**. In the exemplary embodiment, the forwarding of the update message can be achieved by "SendMessage (MESSAGE_RefreshCustomerList);" in the case of Windows.

Following block **708** directly or following the decision block **702** in the case in which no user selection occurred, a decision block **710** determines whether an update message has been received. At this point, the product list box processing **700** shifts to a message processing mode, whereas previously, the product list box processing **700** was in a message generation mode. Although these two modes are described with respect to a single flow diagram, it should be recognized that these different modes could be separate processes, threads or objects. In any event, when the decision block **710** determines that no update message has been received, the product list box processing **700** is complete and ends.

On the other hand, when the decision block **710** determines that an update message has been received, the product list box processing **700** proceeds to process the incoming update message. A decision block **712** determines whether the update message has either a customer key or an invoice key associated therewith. If the update message has a customer key associated therewith, then records in the product table **306** associated with the customer key are retrieved **714**. On the other hand, if the update message received has an invoice key associated therewith, then records in the product table **306** associated with the invoice key are retrieved **716**. Following either block **714** or block **716**, the retrieved records are ordered **718** into a first set. In one embodiment, the ordering **718** sorts the records in accordance with a predetermined criteria. Here, in the product list box processing **700**, the records are product records; hence, an alphabetical sorting could be used (see, e.g., list box **132** in FIG. **1**). Then, a selection indicator for each of the retrieved records is provided **720**. The selection indicator operates to distinguishably display the retrieved records of the first set. The selection indicator is a visual indication to the user that is provided for each of the retrieved records of the first set to thereby visually indicate those records as being associated with the user selection. A select count is also determined **722**. The select count is the count of the retrieved records in the first set.

A decision block **724** then determines whether the update message being processed has a customer key or an invoice key. If the update message has the customer key, records in the product table **306** not associated with the customer key are retrieved **726**. On the other hand, if the update message has the invoice key, records in the product table **306** not

associated with the invoice key are retrieved **728**. Following either block **726** or **728**, the retrieved records are ordered **730** into a second set. In one embodiment, the ordering **730** sorts the records in accordance with a predetermined criteria.

Next, the retrieved records of the first and second sets are joined **732**. The resulting joined set is the list of records that are displayed. The joined set is then displayed **736** in the product list box. Note the same records can be displayed by displaying the joined set or by displaying the first set followed by the second set. A total count is also determined **734**. The total count is the count of number of records in the joined set. Also, the select count and the total count are displayed **738**. Following block **738**, the product list box processing **700** is complete and ends.

With respect to the pictorial diagram of a main screen **1000** illustrated in FIG. **10** which illustrates among other things the display results for a specific instance of the product list box processing **700**. Here, the product list box **1004** displays two (2) selected products (records **1010** and **1012**) with the check-mark graphic image **1014** adjacent thereto. In this case, the records of the first set being illustrated occupy the first two (2) rows within the product list box **1004**. Also note that each of the records in the first set are sorted in alphabetical order. The remaining rows within the product list box **1004** are records of the second set. The associated count plate **1022** for the product list box **1004** indicates that two (2) of seventy-five (75) total records are selected.

FIGS. **8**A and **8**B are flow diagrams of invoice list box processing **800** according to an embodiment of the invention. The invoice list box processing **800** is preferably performed by the list box-**3** process **206** illustrated in FIG. **2** which is in turn performed by a computer system having a display screen for displaying information to a user and a user input device for receiving input from the user. An exemplary computer system is described below with reference to FIG. **9**.

The invoice list box processing **800** begins with a decision block **802** that determines whether a user selection has been made. The user selection is, for example, achieved by the user input device of the computer system. Since the invoice list box processing **800** pertains to the invoice list box **148**, the user selection is of one or more invoice records. When the decision block **802** determines that a user selection has been made, the invoice list box processing **800** proceeds to perform blocks **804-808**. On the other hand, when the decision block **802** determines that no user selection has been made, the blocks **804-808** are bypassed.

Once the user selection has been made, a invoice key associated with the user selection is obtained **804**. In the exemplary embodiment, the invoice key is obtained **804** by accessing the invoice table **308** to retrieve the invoice key associated with the user selection. Then, an update message having the invoice key is prepared **806**. An example of an update message is "MESSAGE_RefreshCustomerList". The update message that has been prepared is then sent **808** to the customer list box **116** and the product list box **132**. In the exemplary embodiment, the forwarding of the update message can be achieved by SendMessage (MESSAGE_RefreshCustomerList);" in the case of Windows.

Following block **808** directly or following the decision block **802** in the case in which no user selection occurred, a decision block **810** determines whether an update message has been received. At this point, the invoice list box processing **800** shifts to a message processing mode, whereas previously, the invoice list box processing **800** was in a message generation mode. Although these two modes are described with respect to a single flow diagram, it should be recognized that these different modes could be separate processes, threads or objects. In any event, when the decision block **810** determines that no update message has been received, the invoice list box processing **800** is complete and ends.

On the other hand, when the decision block **610** determines that an update message has been received, the invoice list box processing **800** proceeds to process the incoming update message. A decision block **812** determines whether the update message has either a customer key or a product key associated therewith. If the update message has a customer key associated therewith, then records in the invoice table **308** associated with the customer key are retrieved **614**. On the other hand, if the update message received has a product key associated therewith, then records in the invoice table **308** associated with the product key are retrieved **816**. Following either block **814** or block **816**, the retrieved records are ordered **818** into a first set. In one embodiment, the ordering **818** sorts the records in accordance with a predetermined criteria. Here, in the invoice list box processing, the records are invoice records; hence, a numerical sorting is used (see, e.g., list box **148** in FIG. **1**). Then, a selection indicator for each of the retrieved records is provided **820**. The selection indicator operates to distinguishably display the retrieved records of the first set. The selection indicator is a visual indication to the user that is provided for each of the retrieved records of the first set to thereby visually indicate those records as being associated with the user selection. As an example, the selection indicator can be a check-mark graphic image **1018** such as illustrated in FIG. **10**. A select count is also determined **822**. The select count is the count of the retrieved records in the first set.

A decision block **824** then determines whether the update message being processed has a customer key or a product key. If the update message has the customer key, records in the invoice table **308** not associated with the customer key are retrieved **826**. On the other hand, if the update message has the product key, records in the invoice table **308** not associated with the product key are retrieved **828**. Following either block **826** or **828**, the retrieved records are ordered **830** into a second set. In one embodiment, the ordering **830** sorts the records in accordance with a predetermined criteria.

Next, the retrieved records of the first and second sets are joined **832**. The resulting joined set is the list of records that are displayed. The joined set is then displayed **836** in the invoice list box. Note the same records can be displayed by displaying the joined set or by displaying the first set followed by the second set. A total count is also determined **834**. The total count is the count of number of records in the joined set. Also, the select count and the total count are displayed **838**. Following block **838**, the invoice list box processing **800** is complete and ends.

With respect to the pictorial diagram of a main screen **1000** illustrated in FIG. **10** which illustrates among other things the display results for a specific instance of the invoice list box processing **800**. Here, the invoice list box **1004** displays one (1) selected invoice (record **1016**) with the check-mark graphic image **1018** adjacent thereto. In this case, the records of the first set being illustrated occupy the first row within the invoice list box **1006**. In the invoice list box **1004** of FIG. **10**, there is only a single record in the first set so no sorting or reordering is needed in this specific instance. The remaining rows within the invoice list box **1006** are records of the second set. The associated count plate **1024** for the invoice list box **1006** indicates that one (1) of ninety-one (91) total records are selected.

With respect to the pictorial diagram of a main screen **1100** illustrated in FIG. **11** which illustrates among other things the display results for a specific instance of the invoice list box processing **800**. Here, the invoice list box **1108** displays twenty-eight (28) selected invoices (record **1016**) with the check-mark graphic image **1108** adjacent thereto. In this case, the records of the first set being illustrated occupy the all the displayed rows of the invoice list box **1108**. In the invoice list box **1108** of FIG. **11**, the records of the first set are ordered or sorted numerically by the invoice number. The remaining rows within the invoice list box **1108** are records of the second set.

According to the invention, the user selection made by the user in one of the list boxes automatically causes entries in other of the list boxes that are related to the user selection to be identified. As previously noted, the user selection can be one or more selections. The processing of multiple selections is the same as for individually selections, except that the processing repeats for each of the entries within the group. One way to select multiple entries is for the user to individually select certain entries. Another way to select multiple entries is to select a group of entries. In one embodiment, the selection of a group can be achieved using the group drop down list boxes **122**, **138** and **154** illustrated in FIG. **1**. For example, with respect to FIGS. **1-4**, if a user where to select "Retailers" from the group drop down list box **122**, the list box-**1** process **202** would obtain a group identifier from the group name table **318** that corresponds to the "Retailers" group. The list box-**1** process **202** would also access the customer to group mapping table **312** to convert the group identifier to customer keys and then update the list box **116** to distinguishably display (e.g., highlighting) the selected entries. The customer keys would also be forwarded from the list box-**1** process **202** to the list box processes **204** and **206** for processing. In the case where the selection is made in the list box **132**, the product to group mapping table **316** is used to convert the group identifier to product keys. Similarly, in the case where the selection is made in the list box **148**, the invoice to group mapping table **314** is used to convert the group identifier to invoice keys.

FIG. **11** provides an example of a group selection. In FIG. **11**, a user select "Parts" as a group from the group drop down list box **1112** of the second information area **1114**. Consequently, highlighted entries **1110** appear in the products list box **1106**, and entries related to the parts group appear selected in the list boxes **1102** and **1108**. Similarly, in FIG. **12** which is a pictorial diagram of a main screen **1200** illustrates a multiple selection of entries **1208** in the invoice list box **1206**. Entries in the list boxes **1202** and **1204** that are related to the multiple selection of entries **1208** also appear selected.

The invention employs various computer-implemented operations involving data stored in computer systems. These operations are those requiring physical manipulation of physical quantities. Usually, though not necessarily, these quantities take the form of electrical or magnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated. Further, the manipulations performed are often referred to in terms, such as producing, identifying, retrieving, determining, or comparing. Any of the operations described herein that form part of the invention are useful machine operations. The invention also relates to a device or an apparatus for performing these operations. The apparatus may be specially constructed for the required purposes, or it may be general purpose computer selectively activated or configured by a computer program stored in the computer. In particular, various general purpose machines may be used with computer programs written in accordance with the teachings herein, or it may be more convenient to construct a more specialized apparatus to perform the required operations. An exemplary structure for the invention is described below with respect to FIG. **9**.

FIG. **9** is a block diagram of an exemplary computer system **900** for carrying out the processing according to the invention. The computer system **900** includes a digital computer **902**, a display screen (or monitor) **904**, a printer **906**, a floppy disk drive **908**, a hard disk drive **910**, a network interface **912**, and a keyboard **914**. The digital computer **902** includes a microprocessor **916**, a memory bus **918**, random access memory (RAM) **920**, read only memory (ROM) **922**, a peripheral bus **924**, and a keyboard controller **926**. The digital computer **900** can be a personal computer (such as an IBM compatible personal computer), a workstation computer (such as a Sun Microsystems or Hewlett-Packard workstation), or some other type of computer.

The microprocessor **916** is a general purpose digital processor which controls the operation of the computer system **900**. The microprocessor **916** can be a single-chip processor or can be implemented with multiple components. Using instructions retrieved from memory, the microprocessor **916** controls the reception and manipulation of input data and the output and display of data on output devices. According to the invention, a particular function of microprocessor **916** is to interact with a database (stored in RAM **920**, the floppy disk drive **908**, or the hard disk drive **910**) so as to display information from related tables of the database in different display windows on the display screen **904** associated with the computer system **900** such that a selection of one or more entries in one of the display windows causes the other of the display windows to distinguishably and orderly display those entries that are related to the selection.

The memory bus **918** is used by the microprocessor **916** to access the RAM **920** and the ROM **922**. The RAM **920** is used by the microprocessor **916** as a general storage area and as scratch-pad memory, and can also be used to store input data and processed data. The ROM **922** can be used to store instructions or program code followed by the microprocessor **916** as well as other data.

The peripheral bus **924** is used to access the input, output, and storage devices used by the digital computer **902**. In the described embodiment, these devices include the display screen **904**, the printer device **906**, the floppy disk drive **908**, the hard disk drive **910**, and the network interface **912**. The keyboard controller **926** is used to receive input from keyboard **914** and send decoded symbols for each pressed key to microprocessor **916** over bus **928**.

The display screen **904** is an output device that displays images of data provided by the microprocessor **916** via the peripheral bus **924** or provided by other components in the computer system **900**. According to the invention, different display windows of a main screen presented to a user are interlinked such that a selection of one or more entries in one of the display windows causes the other of the display windows to distinguishably display those entries that are related to the selection. The printer device **906** when operating as a printer provides an image on a sheet of paper or a similar surface. Other output devices such as a plotter, typesetter, etc. can be used in place of, or in addition to, the printer device **906**.

The floppy disk drive **908** and the hard disk drive **910** can be used to store various types of data. The floppy disk drive **908** facilitates transporting such data to other computer systems, and hard disk drive **910** permits fast access to large amounts of stored data.

The microprocessor **916** together with an operating system operate to execute computer code and produce and use data. The computer code and data may reside on the RAM **920**, the ROM **922**, or the hard disk drive **920**. The computer code and data could also reside on a removable program medium and loaded or installed onto the computer system **900** when needed. Removable program mediums include, for example, CD-ROM, PC-CARD, floppy disk and magnetic tape.

The network interface **912** is used to send and receive data over a network connected to other computer systems. An interface card or similar device and appropriate software implemented by the microprocessor **916** can be used to connect the computer system **900** to an existing network and transfer data according to standard protocols.

The keyboard **914** is used by a user to input commands and other instructions to the computer system **900**. Other types of user input devices can also be used in conjunction with the present invention. For example, pointing devices such as a computer mouse, a track ball, a stylus, or a tablet can be used to manipulate a pointer on a series of a general-purpose computer.

The invention can also be embodied as computer readable code on a computer readable medium. The computer readable medium is any data storage device that can store data which can be thereafter be read by a computer system. Examples of the computer readable medium include read-only memory, random-access memory, CD-ROMs, magnetic tape, optical data storage devices. The computer readable medium can also be distributed over a network coupled computer systems so that the computer readable code is stored and executed in a distributed fashion.

The advantages of the invention are numerous. One advantage of the invention is that a user is able to obtain and view on a display screen information within a database related to a selection by the user with minimal user effort and frustration. As a result, the user is able to more efficiently and effectively review related information than conventionally possible. Although the described exemplary embodiment pertains to a small business application program, the invention is applicable to a variety of other situations.

The many features and advantages of the present invention are apparent from the written description, and thus, it is intended by the appended claims, to cover all such features and advantages of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation as illustrated and described. Hence, all suitable modifications and equivalents may be resorted to as falling within the scope of the invention.

What is claimed is:

1. A computer system, comprising:

a database containing tables of data;

a display device, said display device having a plurality of display areas, each of the display areas displays data items from an associated table within said database; and

a processor unit, said processor unit operates to access said database to retrieve the data items from the corresponding associated tables and then display the retrieved data items in the display areas corresponding thereto, and to detect a selection of a displayed data item within a selected one of the display areas by a user and thereafter to automatically modify the data items being displayed in the other of the display areas in accordance with the selected data item by accessing said database to retrieve the data items in two groups, those data items that are related to the selected data item and those data items that are unrelated to the selected data item, by ordering the data items within each of the groups separately, and by respectively displaying the ordered data items for each of the groups in the other of the display areas so that the group of the data items in the other of the display areas that is related to the selected data item is displayed in a visually distinct manner as compared to the group of the data items in the other of the display areas that is unrelated to the selected data item.

2. A computer system as recited in claim **1**, wherein those entries displayed in the other of the display areas that are related to the selected data item are displayed in a graphically distinctive manner from those entries being displayed that are unrelated to the selected data item.

3. A computer system, comprising:

a database containing tables of data;

a display device, said display device having a plurality of display areas, each of the display areas displays data items from an associated table within said database; and

a processor unit, said processor unit operates to access said database to retrieve the data items from the corresponding associated tables and then display the retrieved data items in the display areas corresponding thereto, and to detect a selection of a displayed data item within a selected one of the display areas by a user and thereafter to automatically modify the data items being displayed in the other of the display areas in accordance with the selected data item by obtaining a key from the database in accordance with the selected data item, notifying the other of the display areas of the key, and updating the data items in the other of the display areas so as to visually distinguish those of the data items that are associated with the key from those data items that are not associated with the key.

4. A graphical user interface for a display screen of a computer, said graphical user interface comprising:

a first display area having a first label and a first data window, the first data window displays a first type of data in multiple rows and columns, and the first label identifies the first type of data; and

a second display area having a second label and a second data window, the second data window displays a second type of data in multiple rows and columns, and the second label identifies the second type of data,

wherein one of a first selection of at least one of the rows in the first data window and a second selection of at least one of the rows in the second data window can be made,

wherein the first selection of at least one of the rows in the first data window automatically causes the rows in the second data window that are associated with the first selection to be visually distinguished from other of the rows, and

wherein the second selection of at least one of the rows in the second data window automatically causes the rows in the first data window that are associated with the second selection to be visually distinguished from other of the rows.

5. A graphical user interface as recited in claim **4**,

wherein said graphical user interface further comprises:

a third display area having a third label and a third data window, the third data window displays a third type

of data in multiple rows and columns, and the third label identifies the third type of data;

wherein one of the first selection of at least one of the rows in the first data window, the second selection of at least one of the rows in the second data window and a third selection of at least one of the rows in the third data window can be made,

wherein the first selection of the at least one of the rows in the first data window automatically causes the rows in the second and third data windows that are associated with the first selection to be visually distinguished from other of the rows,

wherein the second selection of at least one of the rows in the second data window automatically causes the rows in the first and third data windows that are associated with the second selection to be visually distinguished from other of the rows, and

wherein the third selection of at least one of the rows in the third data window automatically causes the rows in the first and second data windows that are associated with the third selection to be visually distinguished from other of the rows.

6. A graphical user interface as recited in claim **4**, wherein said graphical user interface is associated with a business application program for a business,

wherein the first label and the first data window are associated with customers of the business, and the second label and the second data window are associated with products or services of the business, and the third label and the third data window are associated with invoices of the business.

7. A method for displaying data on a display device of a computer system, the data being obtained from a database associated with the computer system, said method comprising:

providing the display device with a plurality of display areas, each of the display areas displays a list of data records from an associated table within the database; and

interlinking the display areas via the database such that a selection of certain of the displayed data records from the list in one of the display areas causes one or more data records displayed in at least one of the other display areas that are associated with the selection to be identified in a visually distinct manner, said interlinking including the operations of accessing the database to retrieve data records in two groups, those data records that correspond to the election and those data records that do not, ordering the data records within each of the groups separately, and respectively displaying the ordered data records for each of the groups in at least one of the other display areas,

wherein said interlinking of the display areas is achieved in accordance with at least the relationship between the associated tables of the database.

8. A method for displaying data on a display device of a computer system, the data being obtained from tables in a database associated with the computer system, the display device having a plurality of display areas, said method comprising the operations of:

(a) displaying entries from the database in the display areas;

(b) determining whether a selection of one or more entries being displayed in a particular one of the display areas has occurred;

(c) obtaining a key from the database in accordance with the selection;

(d) notifying the other of the display areas of the key; and

(e) updating the entries in the other of the display areas so as to visually distinguish those of the entries that are associated with the key with those entries that are not associated with the key.

9. A method as recited in claim **8**, wherein said updating (e) comprises:

(e1) accessing the database in accordance with the key to obtain the retrieved entries in the other of the display areas; and

(e2) displaying the retrieved entries in the other of the display areas, with those of the entries that are associated with the key being distinguishably displayed from those entries that are not associated with the key.

10. A method as recited in claim **9**, wherein each of the display areas has an associated table in the database and the entries being displayed in each of the display areas are obtained from the associated table, and

wherein the key is obtained from the table in the database that is associated with the particular one of the display areas where the selection occurred.

11. A method as recited in claim **8**, wherein each of the display areas has an associated table in the database, and

wherein the key is obtained from the table in the database that is associated with the particular one of the display areas where the selection occurred.

12. A method as recited in claim **11**, wherein said updating (e) comprises, for each of the other of the display areas, the operations of:

(e1) retrieving a first set of entries from the associated table in the database that is associated with the key;

(e2) retrieving a second set of entries from the associated table in the database that are not associated with the key; and

(e3) displaying the first and second sets of entries in the corresponding display area with the first set of entries being distinguishably displayed from the second set of entries.

13. A method as recited in claim **11**, wherein said updating (e) comprises, for each of the other of the display areas, the operations of:

(e1) retrieving a first set of entries from the associated table in the database that is associated with the key;

(e2) sorting the first set of entries in accordance with a predetermined criteria;

(e3) retrieving a second set of entries from the associated table in the database that are not associated with the key;

(e4) sorting the second set of entries in accordance with a predetermined criteria; and

(e5) displaying the sorted first set of entries followed by the sorted second set of entries in the corresponding display area with the sorted first set of entries being distinguishably displayed from the sorted second set of entries.

14. A method as recited in claim **13**, wherein said displaying (e5) distinguishably displays the sorted first set of entries from the sorted second set of entries by placing a graphical indicator adjacent to each of the sorted first set of entries.

15. A computer readable media containing program instructions for displaying data on a display device of a computer system, the data being obtained from tables in a database associated with the computer system, the display device

having a plurality of display areas, said computer readable media comprising:

first computer readable code devices for *displaying entries from the database in the display area;*

second computer readable code devices for determining whether a selection of one or more entries being displayed in a particular one of the display areas has occurred;

[second] *third* computer readable code devices for obtaining a key from the database in accordance with the selection;

[third] *fourth* computer readable code devices for notifying the other of the display areas of the key; and

[fourth] *fifth* computer readable code devices for updating the entries in the other of the display areas so as to visually distinguish those of the entries that are associated with the key from those entries that are not associated with the key.

16. A computer readable medium [as recited in claim **15**, wherein said fourth computer readable code devices comprise] *containing program instructions for displaying data on a display device of a computer system, the data being obtained from tables in a database associated with the computer system, the display device having a plurality of display areas, said computer readable media comprising:*

first computer readable code devices for displaying entries from the database in the display area;

second computer readable code devices for determining whether a selection of one or more entries being displayed in a particular one of the display areas has occurred;

third computer readable code devices for obtaining a key from the database in accordance with the selection;

fourth computer readable code devices for notifying the other of the display areas of the key; and

fifth computer readable code devices for updating the entries in the other of the display areas so as to visually distinguish those of the entries that are associated with the key from those entries that are not associated with the key, wherein said fifth computer readable code comprises:

computer readable code devices for accessing the database in accordance with the key to obtain the retrieved entries in the other of the display areas; and

computer readable code devices for displaying the retrieved entries in the other of the display areas, with those of the entries that are associated with the key being distinguishably displayed from those entries that are not associated with the key.

17. A computer readable medium as recited in claim **16**, wherein each of the display areas has an associated table in the database, and the key is obtained from the table in the database that is associated with the particular one of the display areas where the selection occurred.

18. A computer readable media [as recited in claim **15**, wherein said fourth computer program code comprise] *containing program instructions for displaying data on a display device of a computer system, the data being obtained from tables in a database associated with the computer system, the display device having a plurality of display areas, said computer readable media comprising:*

first computer readable code devices for displaying entries from the database in the display area;

second computer readable code devices for determining whether a selection of one or more entries being displayed in a particular one of the display areas has occurred;

third computer readable code devices for obtaining a key from the database in accordance with the selection;

fourth computer readable code devices for notifying the other of the display areas of the key; and

fifth computer readable code devices for updating the entries in the other of the display areas so as to visually distinguish those of the entries that are associated with the key from those entries that are not associated with the key wherein the fifth computer readable code comprises computer program code for identifying at least one of those of the entries that are associated with the key and those of the entries that are not associated with the key; and

computer program code for distinguishably displaying those of the entries associated with the key in the corresponding display area from those of the entries not associated with the key.

19. A computer readable media as recited in claim **18**, wherein said fourth computer program code further comprises:

computer program code for sorting those of the entries associated with the key with respect to the corresponding display area.

20. A computer readable media as recited in claim **18**, wherein said fourth computer program code further comprises:

computer program code for determining a select count indicating a number of those of the entries in the corresponding display area associated with the key; and

computer program code for displaying the select count on the display device proximate to the corresponding display area.

21. A computer readable media as recited in claim **20**, wherein said fourth computer program code further comprises:

computer program code for sorting those of the entries associated with the key with respect to the corresponding display area.

22. A computer readable media as recited in claim **18**, wherein said fourth computer program code further comprises:

computer program code for determining a select count indicating a number of those of the entries in the corresponding display area associated with the key; and

computer program code for determining a total count indicating a total number of those of the entries in the corresponding display area; and

computer program code for displaying the select count and the total count on the display device proximate to the corresponding display area.

23. A system for displaying data, comprising:

a processor, for providing information to be displayed;

a display device, coupled to the processor, for displaying information, the display device comprising:

a first display area having a first label and a first data window, the first data window displaying a first type of data in multiple rows and columns, and the first label identifying the first type of data; and

a second display area having a second label and a second data window, the second data window displaying a second type of data in multiple rows and columns, and the second label identifying the second type of data,

an input device, coupled to the processor, for receiving user selection of at least one of a first selection of at

least one of the rows in the first data window and a second selection of at least one of the rows in the second data window; and

wherein the first selection of at least one of the rows in the first data window automatically causes the rows in the second data window that are associated with the first selection to be visually distinguished from other of the rows, and

wherein the second selection of at least one of the rows in the second data window automatically causes the rows in the first data window that are associated with the second selection to be visually distinguished from other of the rows.

24. The system of claim 23, wherein said first and second display areas further include count indicators that are displayed proximate to the corresponding display area, the count indicators indicating a number of entries being selected as well as a total number of entries being displayed in the corresponding display area.

25. The system of claim 23, wherein the display device further comprises:

a third display area having a third label and a third data window, the third data window displaying a third type of data in multiple rows and columns, and the third label identifying the third type of data,

wherein the input device receives user selection of at least one of the first selection of at least one of the rows in the first data window, the second selection of at least one of the rows in the second data window and a third selection of at least one of the rows in the third data window,

wherein the first selection of the at least one of the rows in the first data window automatically causes the rows in the second and third data windows that are associated with the first selection to be visually distinguished from other of the rows,

wherein the second selection of at least one of the rows in the second data window automatically causes the rows in the first and third data windows that are associated with the second selection to be visually distinguished from other of the rows, and

wherein the third selection of at least one of the rows in the third data window automatically causes the rows in the first and second data windows that are associated with the third selection to be visually distinguished from other of the rows.

26. The system of claim 25, wherein the displayed information is associated with a business application program for a business,

wherein the first label and the first data window are associated with customers of the business, and the second label and the second data window are associated with products or services of the business, and the third label and the third data window are associated with invoices of the business.

27. A system for displaying data, comprising:

a processor, for providing data to be displayed, the data being obtained from tables in a database associated with the computer system;

an input device, coupled to the processor, for receiving user selection of at least one displayed entry; and

a display device, coupled to the processor, for displaying entries from the database in the display areas, the display device having a plurality of display areas;

wherein, responsive to the input device receiving a selection of one or more entries being displayed in a particular one of the display areas,

the processor obtains a key from the database in accordance with the selection and notifies the other of the display areas of the key; and

the display device updates the entries in the other of the display areas so as to visually distinguish those of the entries that are associated with the key with those entries that are not associated with the key.

28. The system of claim 27, wherein the processor updates the entries by accessing the database in accordance with the key to obtain the retrieved entries in the other of the display areas, and the display device displays the retrieved entries in the other of the display areas, with those of the entries that are associated with the key being distinguishably displayed from those entries that are not associated with the key.

29. The system of claim 27, wherein each of the display areas has an associated table in the database and the entries being displayed in each of the display areas are obtained from the associated table, and

wherein the key is obtained from the table in the database that is associated with the particular one of the display areas where the selection occurred.

30. The system of claim 27, wherein each of the display areas is associated with at least one table in the database, and wherein the processor obtains the key from the table in the database that is associated with the particular one of the display areas where the selection occurred.

31. The system of claim 27, wherein the processor updates the entries by performing, for each of the other of the display areas, at least the operations of:

retrieving a first set of entries from the associated table in the database that is associated with the key;

retrieving a second set of entries from the associated table in the database that are not associated with the key; and

signaling the display device to display the first and second sets of entries in the corresponding display area with the first set of entries being distinguishably displayed from the second set of entries.

32. The system of claim 27, wherein the processor updates the entries by performing, for each of the other of the display areas, at least the operations of:

retrieving a first set of entries from the associated table in the database that is associated with the key;

sorting the first set of entries in accordance with at least one predetermined criterion;

retrieving a second set of entries from the associated table in the database that are not associated with the key;

sorting the second set of entries in accordance with at least one predetermined criterion; and

signaling the display device to display the sorted first set of entries followed by the sorted second set of entries in the corresponding display area with the sorted first set of entries being distinguishably displayed from the sorted second set of entries.

33. The system of claim 32, wherein the display device distinguishably displays the sorted first set of entries from the sorted second set of entries by placing a graphical indicator adjacent to each of the sorted first set of entries.

34. The system of claim 27, wherein the processor updates the entries by performing, for each of the other of the display areas, at least the operations of:

retrieving a first set of entries from the associated table in the database that is associated with the key;

sorting the first set of entries in accordance with at least one predetermined criterion;

retrieving a second set of entries from the associated table in the database that are not associated with the key;

sorting the second set of entries in accordance with at least one predetermined criterion;

signaling the display device to display the sorted first set of entries followed by the sorted second set of entries in the corresponding display area with the sorted first set of entries being distinguishably displayed from the sorted second set of entries;

determining a select count indicating a number of entries in the first set of entries;

determining a total count indicating a total number of entries in the first and second sets of entries; and

signaling the display device to display the select count and the total count proximate to the corresponding display area.

35. A method for displaying data, comprising:

displaying, in a first display area having a first label and a first data window, a first type of data in multiple rows and columns, wherein the first label identifies the first type of data;

displaying, in a second display area having a second label and a second data window, a second type of data in multiple rows and columns, wherein the second label identifies the second type of data;

receiving one of a first selection of at least one of the rows in the first data window and a second selection of at least one of the rows in the second data window;

responsive to a first selection of at least one of the rows in the first data window, visually distinguishing the rows in the second data window that are associated with the first selection from other of the rows; and

responsive to a second selection of at least one of the rows in the second data window, visually distinguishing the rows in the first data window that are associated with the second selection from other of the rows.

36. The method of claim 35, further comprising:

displaying, proximate to at least one of the display areas, at least one count indicator indicating a number of entries being selected as well as a total number of entries being displayed in the corresponding display area.

37. The method of claim 35, further comprising:

displaying, in a third display area having a third label and a third data window, a third type of data in multiple rows and columns, wherein the third label identifies the third type of data;

receiving one of a first selection of at least one of the rows in the first data window, a second selection of at least one of the rows in the second data window, and a third selection of at least one of the rows in the third data window;

responsive to a first selection of at least one of the rows in the first data window, visually distinguishing the rows in the second and third data windows that are associated with the first selection from other of the rows;

responsive to a second selection of at least one of the rows in the second data window, visually distinguishing the rows in the first and third data windows that are associated with the second selection from other of the rows; and

responsive to a third selection of at least one of the rows in the third data window, visually distinguishing the rows in the first and second data windows that are associated with the third selection from other of the rows.

38. The method of claim 35, wherein:

the data is associated with a business application program for a business;

the first label and the first data window are associated with customers of the business;

the second label and the second data window are associated with products or services of the business; and

the third label and the third data window are associated with invoices of the business.

39. A computer program product for displaying related information, comprising:

a computer readable medium; and

computer program instructions, encoded on the medium, for controlling a processor to perform the operations of:

displaying, in a first display area having a first label and a first data window, a first type of data in multiple rows and columns, wherein the first label identifies the first type of data;

displaying, in a second display area having a second label and a second data window, a second type of data in multiple rows and columns, wherein the second label identifies the second type of data;

receiving one of a first selection of at least one of the rows in the first data window and a second selection of at least one of the rows in the second data window;

responsive to a first selection of at least one of the rows in the first data window, visually distinguishing the rows in the second data window that are associated with the first selection from other of the rows; and

responsive to a second selection of at least one of the rows in the second data window, visually distinguishing the rows in the first data window that are associated with the second selection from other of the rows.

40. The computer program product of claim 39, further comprising:

computer program instructions, encoded on the medium, for controlling a processor to perform the operation of:

displaying, proximate to at least one of the display areas, at least one count indicator indicating a number of entries being selected as well as a total number of entries being displayed in the corresponding display area.

41. The computer program product of claim 39, further comprising computer program instructions, encoded on the medium, for controlling a processor to perform the operations of:

displaying, in a third display area having a third label and a third data window, a third type of data in multiple rows and columns, wherein the third label identifies the third type of data;

receiving one of a first selection of at least one of the rows in the first data window, a second selection of at least one of the rows in the second data window, and a third selection of at least one of the rows in the third data window;

responsive to a first selection of at least one of the rows in the first data window, visually distinguishing the rows in the second and third data windows that are associated with the first selection from other of the rows;

responsive to a second selection of at least one of the rows in the second data window, visually distinguishing the rows in the first and third data windows that are associated with the second selection from other of the rows; and

responsive to a third selection of at least one of the rows in the third data window, visually distinguishing the rows in the first and second data windows that are associated with the third selection from other of the rows.

42. The computer program product of claim 39, wherein:

the data is associated with a business application program for a business;

the first label and the first data window are associated with customers of the business;

the second label and the second data window are associated with products or services of the business; and

the third label and the third data window are associated with invoices of the business.

43. The computer program product of claim 6, wherein the computer program code for displaying the sorted first set of entries followed by the sorted second set of entries in the corresponding display area comprises computer program code for distinguishably displaying the sorted first set of entries from the sorted second set of entries by placing a graphical indicator adjacent to each of the sorted first set of entries.

44. A computer system, comprising:

a storage device, for storing tables of data;

a display device, said display device having a plurality of display areas, each of the display areas displaying data items from an associated table; and

a processor unit, operating to retrieve the data items from the corresponding associated tables and then display the retrieved data items in the display areas corresponding thereto, and to detect a selection of a displayed data item within a selected one of the display areas by a user and thereafter to automatically modify the data items being displayed in the other of the display areas in accordance with the selected data item by retrieving those data items that are related to the selected data item, and by displaying the retrieved data items in the other of the display areas in a visually distinct manner as compared to displayed data items that are unrelated to the selected data item.

45. The computer system of claim 44, wherein the processor unit further retrieves those data items that are unrelated to the selected data item.

46. The computer system of claim 44, wherein those entries displayed in the other of the display areas that are related to the selected data item are displayed in a graphically distinctive manner from those entries being displayed that are unrelated to the selected data item.

47. A method for displaying data on a display device, comprising:

storing tables of data;

displaying, in each of a plurality of display areas, data items from an associated table;

retrieving data items from at least one of a plurality of tables;

displaying the retrieved data items in at least one of a plurality of display areas each of the display areas corresponding to one of the tables;

detecting a selection of a displayed data item within a selected one of the display areas by a user; and

automatically modifying the data items being displayed in the other of the display areas in accordance with the selected data item by retrieving those data items that are related to the selected data item, and by displaying the retrieved data items in the other of the display areas in a visually distinct manner as compared to displayed data items that are unrelated to the selected data item.

48. The method of claim 47, further comprising:

retrieving and displaying at least one data item that is unrelated to the selected data item.

49. The method of claim 47, wherein displaying the retrieved data items in the other of the display areas comprises displaying entries in the other of the display areas that are related to the selected data item in a graphically distinctive manner from those entries being displayed that are unrelated to the selected data item.

50. A computer program product for displaying data on a display device, comprising:

a computer readable medium; and

computer program instructions, encoded on the medium, for controlling a processor to perform the operations of:

storing tables of data;

displaying, in each of a plurality of display areas, data items from an associated table;

retrieving data items from at least one of a plurality of tables;

displaying the retrieved data items in at least one of a plurality of display areas, each of the display areas corresponding to one of the tables;

detecting a selection of a displayed data item within a selected one of the display areas by a user; and

automatically modifying the data items being displayed in the other of the display areas in accordance with the selected data item by retrieving those data items that are related to the selected data item, and by displaying the retrieved data items in the other of the display areas in a visually distinct manner as compared to displayed data items that are unrelated to the selected data item.

51. The computer program product of claim 50, further comprising:

computer program instructions, encoded on the medium, for controlling a processor to perform the operation of: retrieving and displaying at least one data item that is unrelated to the selected data item.

52. A computer program product for displaying data on a display device, comprising

a computer readable medium; and

computer program instructions, encoded on the medium, for controlling a processor to perform the operations of:

storing tables of data;

having a plurality of display areas, each of the display areas displaying data items from an associated table;

retrieving data items from at least one of a plurality of tables;

displaying the retrieved data items in at least one of a plurality of display areas, each of the display areas corresponding to one of the tables;

detecting a selection of a displayed data item within a selected one of the display areas by a user; and

automatically modifying the data items being displayed in the other of the display areas in accordance with the selected data item by retrieving those data items that are related to the selected data item, and by displaying the retrieved data items in the other of the display areas in a visually distinct manner as compared to displayed data items that are unrelated to the selected data item; wherein the computer program instructions for controlling a processor to perform the operation of displaying the retrieved data

items in the other of the display areas comprises computer program instructions, encoded on the medium, for controlling a processor to perform the operation of displaying entries in the other of the display areas that are related to the selected data item in a graphically distinctive manner from those entries being displayed that are unrelated to the selected data item.

53. A graphical user interface for a display screen of a computer, said graphical user interface comprising:

a first display area having a first data window, the first data window displaying a first type of data in multiple rows and columns; and

a second display area having a second data window, the second data window displaying a second type of data in multiple rows and columns, wherein a first selection of at least one of the rows in the first data window can be made and wherein the first selection of at least one of the rows in the first data window automatically causes rows in the second data window that are associated with the first selection to be visually changed and for other of the rows not associated with the first selection to remain visually unchanged;

a third display area having a third data window, the third data window displaying a third type of data in multiple rows and columns,

wherein a first selection of at least one of the rows in the first data window can be made, and

wherein the first selection of the at least one of the rows in the first data window automatically causes the rows in the second and third data windows that are associated with the first selection to be visually distinguished from other of the rows.

54. The graphical user interface of claim 53, wherein the graphical user interface is associated with a business application program for a business,

wherein the first data window is associated with customers of the business, and the second data window is associated with products or services of the business, and the third data window is associated with invoices of the business.

55. A method for displaying data on a display device, comprising:

displaying, in a first display window of a first display area, a first type of data in multiple rows and columns; and

displaying, in a second display window of a second display area, a second type of data in multiple rows and columns,

receiving a selection of at least one of the rows in the first data window, and

responsive to the selection, automatically causing rows in the second data window that are associated with the first selection to be visually changed and for other of the rows not associated with the first selection to remain visually unchanged; and

displaying, in a third display window of a third display area, a third type of data in multiple rows and columns; and

responsive to the selection, automatically causing rows in the third data window that are associated with the first selection to be visually distinguished from other of the rows in the third data window.

56. The method of claim 55, wherein the method is associated with a business application program for a business,

wherein the first data window is associated with customers of the business, and the second data window is associated with products or services of the business, and the third data window is associated with invoices of the business.

57. A computer program product for displaying data on a display device, comprising:

a computer readable medium; and

computer program instructions, encoded on the medium, for controlling a processor to perform the operations of:

displaying, in a first display window of a first display area, a first type of data in multiple rows and columns;

displaying, in a second display window of a second display area, a second type of data in multiple rows and columns;

receiving a selection of at least one of the rows in the first data window,

responsive to the selection, automatically causing rows in the second data window that are associated with the first selection to be visually changed and for other of the rows not associated with the first selection to remain visually unchanged; and

computer program instructions, encoded on the medium, for controlling a processor to perform the operations of:

displaying, in a third display window of a third display area, a third type of data in multiple rows and columns; and

responsive to the selection, automatically causing rows in the third data window that are associated with the first selection to be visually distinguished from other of the rows in the third data window.

58. The computer program product of claim 57, wherein the displayed information is associated with a business application program for a business,

wherein the first data window is associated with customers of the business, and the second data window is associated with products or services of the business, and the third data window is associated with invoices of the business.

59. A method for displaying data on a display device of a computer system, the data being obtained from a database associated with the computer system, said method comprising:

displaying a plurality of display areas, each of the display areas comprising a list of data records from an associated table within the database; and

interlinking the display areas via the database such that a selection of certain of the displayed data records from the list in one of the display areas causes one or more data records displayed in at least one of the other display areas that are associated with the selection to be identified in a visually distinct manner, said interlinking comprising:

accessing the database to retrieve those data records that correspond to the selection;

and displaying the data records in at least one of the other display areas,

wherein said interlinking of the display areas is achieved in accordance with at least the relationship between the associated tables of the database.

60. The method of claim 59, wherein interlinking the display areas further comprises:

accessing the database to retrieve those data records that do not correspond to the selection;

and wherein displaying the data records comprises:

displaying a first group comprising the data records that correspond to the selection; and

displaying a second group comprising the data records that do correspond to the selection;

wherein the first group is displayed in a manner that is visually distinct from the second group.

61. A system for displaying related information, comprising:

an input device, for receiving a user selection;

a processor, coupled to the input device, for obtaining from a database data records that correspond to the selection;

a display device, coupled to the processor, for displaying data in a plurality of display areas, each of the display areas displaying a list of data records from an associated table within the database, wherein the display areas are interlinked via the database such that, in response to the received user selection of certain of the displayed data records from the list in one of the display areas, the display device displays one or more data records in at least one of the other display areas that are associated with the selection in a visually distinct manner, and further respectively displays the data records in at least one of the other display areas,

wherein said interlinking of the display areas is achieved in accordance with at least the relationship between the associated tables of the database.

62. The system of claim 61, wherein:

the processor obtains data records from the database data records that correspond to the selection of a database in a first group, and further obtains those data records that do not correspond to the selection in a second group, and further orders the data records within each of the groups separately; and

the display device displays the ordered data records for each of the groups in at least one of the other display areas.

63. A computer program product for displaying data on a display device of a computer system, the data being obtained from a database associated with the computer system, said computer program product comprising:

a computer readable medium; and

computer program instructions, encoded on the medium, for controlling a processor to perform the operations of:

displaying a plurality of display areas, each of the display areas comprising a list of data records from an associated table within the database; and

interlinking the display areas via the database such that a selection of certain of the displayed data records from the list in one of the display areas causes one or more data records displayed in at least one of the other display areas that are associated with the selection to be identified in a visually distinct manner, said interlinking comprising:

accessing the database to retrieve those data records that correspond to the selection;

and displaying the data records in at least one of the other display areas,

wherein said interlinking of the display areas is achieved in accordance with at least the relationship between the associated tables of the database.

64. The computer program product of claim 63, wherein the computer program instructions for controlling a processor to perform the operation of interlinking the display areas further comprise:

computer program instructions, encoded on the medium, for controlling a processor to perform the operation of accessing the database to retrieve those data records that do not correspond to the selection;

and wherein the computer program instructions for controlling a processor to perform the operation of displaying the data records comprise computer program instructions, encoded on the medium, for controlling a processor to perform the operations of:

displaying a first group comprising the data records that correspond to the selection; and

displaying a second group comprising the data records that do correspond to the selection;

wherein the first group is displayed in a manner that is visually distinct from the second group.

65. A method for displaying data on a display device of a computer system, the data being obtained from tables, the display device having a plurality of display areas, said method comprising the operations of:

(a) displaying entries in the display areas;

(b) receiving a selection of one or more entries being displayed in a particular one of the display areas;

(c) updating the entries in the other of the display areas so as to visually change those of the entries that are associated with the selection and leave those entries that are not associated with the selection visually unchanged; wherein updating (c) comprises:

(c1) accessing a database to obtain the retrieved entries in the other of the display areas; and

(c2) displaying the retrieved entries in the other of the display areas, with those of the entries that are associated with the selection being distinguishably displayed from those entries that are not associated with the selection.

66. A method for displaying data on a display device of a computer system, the data being obtained from tables, the display device having a plurality of display areas, said method comprising the operations of:

(a) displaying entries in the display areas;

(b) receiving a selection of one or more entries being displayed in a particular one of the display areas;

(c) updating the entries in the other of the display areas so as to visually change those of the entries that are associated with the selection and leave those entries that are not associated with the selection visually unchanged; wherein updating (c) comprises, for each of the other of the display areas, the operations of:

(c1) retrieving, from an associated table, a first set of entries that are associated with the selection;

(c2) retrieving, from the associated table, a second set of entries that are not associated with the selection; and

(c3) displaying the first and second sets of entries in the corresponding display area with the first set of entries being distinguishably displayed from the second set of entries.

67. A method for displaying data on a display device of a computer system, the data being obtained from tables, the display device having a plurality of display areas, said method comprising the operations of:

(a) displaying entries in the display areas;

(b) receiving a selection of one or more entries being displayed in a particular one of the display areas;

(c) updating the entries in the other of the display areas so as to visually change those of the entries that are asso-

ciated with the selection and leave those entries that are not associated with the selection visually unchanged; wherein updating (c) comprises, for each of the other of the display areas, the operations of:

(c1) retrieving, from an associated table, a first set of entries that are associated with the selection;

(c2) sorting the first set of entries in accordance with at least one predetermined criterion;

(c3) retrieving, from the associated table, a second set of entries that are not associated with the selection; and

(c4) sorting the second set of entries in accordance with at least one predetermined criterion; and

(c5) displaying the sorted first set of entries and the sorted second set of entries with the sorted first set of entries being distinguishably displayed from the sorted second set of entries.

68. The method of claim 67, wherein displaying (c5) comprises distinguishing the sorted first set of entries from the sorted second set of entries by placing a graphical indicator adjacent to each of the sorted first set of entries.

69. A system for displaying data, comprising:

a processor, for providing data to be displayed;

an input device, coupled to the processor, for receiving user selection of at least one displayed entry; and

a display device, coupled to the processor, for displaying entries in the display areas, the display device having a plurality of display areas;

wherein, responsive to the input device receiving a selection of one or more entries being displayed in a particular one of the display areas,

the display device automatically updates the entries in the other of the display areas so as to visually change those of the entries that are associated with the selection and leave those entries that are not associated with the selection visually unchanged; wherein the processor updates the entries by accessing a database to obtain the retrieved entries in the other of the display areas, and the display device displays the retrieved entries in the other of the display areas, with those of the entries that are associated with the selection being distinguishably displayed from those entries that are not associated with the selection.

70. A system for displaying data, comprising:

a processor, for providing data to be displayed;

an input device, coupled to the processor, for receiving user selection of at least one displayed entry; and

a display device, coupled to the processor, for displaying entries in the display areas, the display device having a plurality of display areas;

wherein, responsive to the input device receiving a selection of one or more entries being displayed in a particular one of the display areas,

the display device automatically updates the entries in the other of the display areas so as to visually change those of the entries that are associated with the selection and leave those entries that are not associated with the selection visually unchanged; wherein the processor updates the entries by performing, for each of the other of the display areas, at least the operations of:

retrieving, from an associated table, a first set of entries that are associated with the selection;

retrieving, from the associated table, a second set of entries that are not associated with the selection; and

signaling the display device to display the first and second sets of entries in the corresponding display area with the first set of entries being distinguishably displayed from the second set of entries.

71. A system for displaying data, comprising:

a processor, for providing data to be displayed;

an input device, coupled to the processor, for receiving user selection of at least one displayed entry; and

a display device, coupled to the processor, for displaying entries in the display areas, the display device having a plurality of display areas;

wherein, responsive to the input device receiving a selection of one or more entries being displayed in a particular one of the display areas, the display device automatically updates the entries in the other of the display areas so as to visually change those of the entries that are associated with the selection and leave those entries that are not associated with the selection visually unchanged;

wherein the processor updates the entries by performing, for each of the other of the display areas, at least the operations of:

retrieving, from an associated table, a first set of entries that are associated with the selection;

sorting the first set of entries in accordance with at least one predetermined criterion;

retrieving, from the associated table, a second set of entries that are not associated with the selection;

sorting the second set of entries in accordance with at least one predetermined criterion; and

signaling the display device to display the sorted first set of entries and the sorted second sets of entries with the sorted first set of entries being distinguishably displayed from the sorted second set of entries.

72. The system of claim 7, wherein the display device distinguishes the sorted first set of entries from the sorted second set of entries by placing a graphical indicator adjacent to each of the sorted first set of entries.

73. A computer program product for displaying data on a display device of a computer system, the data being obtained from tables, the display device having a plurality of display areas, said computer program product comprising:

a computer readable medium; and

computer program instructions, encoded on the medium, for controlling a processor to perform the operations of:

(a) displaying entries in the display areas;

(b) receiving a selection of one or more entries being displayed in a particular one of the display areas; and

(c) automatically updating the entries in the other of the display areas so as to visually change those of the entries that are associated with the selection and leave those entries that are not associated with the selection visually unchanged; wherein the computer program instructions for controlling a processor to perform the operation of updating (c) comprise computer program instructions, encoded on the medium, for controlling a processor to perform the operations of:

(c1) accessing a database to obtain the retrieved entries in the other of the display areas; and

(c2) displaying the retrieved entries in the other of the display areas, with those of the entries that are associated with the selection being distinguishably displayed from those entries that are not associated with the selection.

74. The computer program product of claim 73, wherein the computer program instructions for controlling a proces-

sor to perform the operation of updating (c) comprise computer program instructions, encoded on the medium, for controlling a processor to perform the operations of, for each of the other of the display areas:

(c1) retrieving, from an associated table, a first set of entries that are associated with the selection;

(c2) retrieving, from the associated table, a second set of entries that are not associated with the selection; and

(c3) displaying the first and second sets of entries in the corresponding display area with the first set of entries being distinguishably displayed from the second set of entries.

75. The computer program product of claim 73, wherein the computer program instructions for controlling a processor to perform the operation of updating (c) comprise computer program instructions, encoded on the medium, for controlling a processor to perform the operations of, for each of the other of the display areas:

(c1) retrieving, from an associated table, a first set of entries that are associated with the selection;

(c2) sorting the first set of entries in accordance with at least one predetermined criterion;

(c3) retrieving, from the associated table, a second set of entries that are not associated with the selection; and

(c4) sorting the second set of entries in accordance with at least one predetermined criterion; and

(c5) displaying the sorted first set of entries and the sorted second set of entries with the sorted first set of entries being distinguishably displayed from the sorted second set of entries.

76. The computer program product of claim 75, wherein the computer program instructions for controlling a processor to perform the operation of displaying (c5) comprise computer program instructions, encoded on the medium, for controlling a processor to perform the operation of distinguishing the sorted first set of entries from the sorted second set of entries by placing a graphical indicator adjacent to each of the sorted first set of entries.

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