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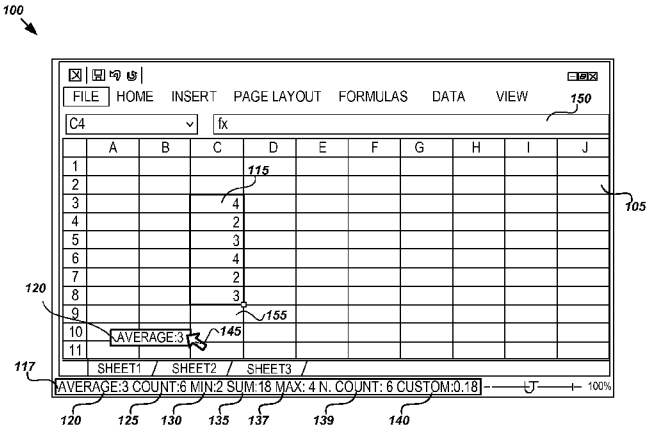

FIG. 1

(57) Abstract: Inserting a formula at a location on a content surface in a user interface is provided. A user interface showing a status bar which includes one or more predetermined calculations may be displayed on a computer. The computer may receive a selection of a predetermined calculation from the status bar in the user interface. The selected predetermined calculation may then be dragged from the status bar and inserted at a drop location on the content surface in the user interface. The computer may then automatically generate a formula corresponding to the selected predetermined calculation in the user interface.

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DRAG AND DROP ALWAYS SUM FORMULAS

BACKGROUND

[0001] Computer productivity applications include functionality for users to enter formulas to perform calculations on data which may be displayed in a table created by a spreadsheet or word processing application. Generally, the task of entering or typing formulas is a difficult task for many users in that they have to learn all of the function names and a syntax for the typing in of formulas in an application. The aforementioned task is even more difficult on tablet or touch slate type devices because of the added difficulty of typing on virtual or on-screen keyboards. For example, on many tablet computing devices, users must change to different keyboard views to gain access between symbols (such as mathematical operators), numbers and text. It is with respect to these considerations and others that the various embodiments described herein have been made.

SUMMARY

[0002] This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended as an aid in determining the scope of the claimed subject matter.

[0003] Embodiments are provided for inserting a formula at a location on a content surface in a user interface. A user interface showing a status bar which includes one or more predetermined calculations may be displayed on a computer. The computer may the receive a selection of a predetermined calculation from the status bar in the user interface. The selected predetermined calculation may then be dragged from the status bar and inserting at a drop location on the content surface in the user interface. The computer may then automatically generate a formula corresponding to the selected predetermined calculation in the user interface.

[0004] These and other features and advantages will be apparent from a reading of the following detailed description and a review of the associated drawings. It is to be understood that both the foregoing general description and the following detailed description are illustrative only and are not restrictive of the invention as claimed.

[0005] This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the detailed description. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended as an aid in determining the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIGURE 1 is a computer screen display of a user interface showing a predetermined calculation being dragged from a status bar to a drop location on a content surface, in accordance with an embodiment;

[0007] FIGURE 2 is a computer screen display of a user interface showing a formula which was generated following the dropping of a predetermined calculation at a drop location on a content surface, in accordance with an embodiment;

[0008] FIGURE 3 is a computer screen display of a user interface showing a predetermined calculation being dragged from a status bar to a drop location on a content surface, in accordance with another embodiment;

[0009] FIGURE 4 is a computer screen display of a user interface showing a descriptive label added to the display of a predetermined calculation at a drop location on a content surface, in accordance with an embodiment;

[0010] FIGURE 5 is a flow diagram illustrating a routine for inserting a formula at a location on a content surface in a user interface, in accordance with an embodiment;

[0011] FIGURE 6 is a simplified block diagram of a computing device with which various embodiments may be practiced;

[0012] FIGURE 7A is a simplified block diagram of a mobile computing device with which various embodiments may be practiced;

[0013] FIGURE 7B is a simplified block diagram of a mobile computing device with which various embodiments may be practiced; and

[0014] FIGURE 8 is a simplified block diagram of a distributed computing system in which various embodiments may be practiced.

DETAILED DESCRIPTION

[0015] Embodiments are provided for inserting a formula at a location on a content surface in a user interface. A user interface showing a status bar which includes one or more predetermined calculations may be displayed on a computer. The computer may the receive a selection of a predetermined calculation from the status bar in the user interface. The selected predetermined calculation may then be dragged from the status bar and inserting at a drop location on the content surface in the user interface. The computer may then automatically generate a formula corresponding to the selected predetermined calculation in the user interface.

[0016] FIGURE 1 is a computer screen display of a user interface 100 showing a predetermined calculation 120 being dragged from a status bar 117 to a drop location 155 on a content surface 105, in accordance with an embodiment. The user interface 100 may be generated by a productivity application executed by a computer. In accordance with an embodiment, the productivity application may include a client or web-based spreadsheet application such as the EXCEL spreadsheet software from MICROSOFT CORPORATION of Redmond Washington. It should be understood, however, that other spreadsheet applications from other manufacturers may be utilized in accordance with the various embodiments described herein. It should be appreciated by those skilled in the art that other productivity applications may also be utilized in accordance with the various embodiments described herein. The other productivity applications may include, but are not limited to, word processing software, presentation graphics software, diagramming software, project management software, publishing software and note-taking software. It should be appreciated that the aforementioned productivity applications may comprise individual application programs or alternatively, may be incorporated into a suite of productivity applications such as the OFFICE application program suite from MICROSOFT CORPORATION.

[0017] The content surface 105 in the user interface 100 may comprise a spreadsheet application worksheet (i.e., a spreadsheet) for displaying data values 115 which may be displayed in a column in the content surface 105. The status bar 117 may display a number of predetermined calculations which are automatically generated from commonly used formulas based upon the data values 115. In accordance with an embodiment, the productivity application utilized for generating the content surface 105 may further be configured to automatically generate predetermined calculations which may include, but are not limited to, Average 120, Count 125, Min 130, Sum 135, Max 137 and Numerical Count 139 on selected cells containing the data values 115 based on commonly used formulas, such as aggregate functions. For example, in response to a selection of the data values in the cells C3 through C8, the productivity application may automatically utilize formulas (i.e., aggregate functions) for calculating the average, count, min and sum of the selected data values and display the results in the status bar 117. It should be understood that other aggregate functions may also be utilized in accordance with the embodiments described herein. It should further be understood, that in accordance with an embodiment, the predetermined calculations may also be associated with formulas other than aggregate functions. For example, for a word processing document, the productivity

application described herein may be configured to automatically utilize field codes (i.e., placeholders for data that might change in a document) instead of aggregate functions to automatically calculate dates and page numbers associated with document, for display in the status bar 117. Similarly, for a presentation document, the productivity application described herein may be configured to automatically utilize program instructions to automatically calculate slide numbers for slides comprising the presentation document, for display in the status bar 117. The status bar 117 may also display a Custom calculation 140 which may be the result of a user-created formula. For example, the Custom calculation 140 represents a sum of the data values 115 in the range of cells C3:C8 divided by 100. It should be understood that other custom calculations may also be defined without departing from the scope of the embodiments described herein such as converting feet to inches. In accordance with an embodiment, custom calculations may be created by typing a formula in a spreadsheet cell and dragging the formula to the status bar 117 such that any range of cells selected on a spreadsheet would be automatically calculated according to the user-created formula.

[0018] As briefly discussed above, the user interface 100 shows the predetermined calculation Average 120 being dragged from the status bar 117 to drop location 155 on the content surface 105. In accordance with an embodiment, the dragging of the predetermined calculation Average 120 from the status bar 117 may be initiated on a computing device in response to a user navigating pointer 145 to the predetermined calculation Average 120, using a computer input device (e.g., a mouse) to drag the predetermined calculation Average 120 onto the content surface 105 towards the drop location 155. In accordance with another embodiment, the dragging of the predetermined calculation Average 120 may be initiated by a user in response to a touch input on a touch-enabled computing device, such as a tablet or touch slate type device, by using a finger or stylus to drag the predetermined calculation Average 120 from the status bar 117 onto the content surface 105 towards the drop location 155. In accordance with yet another embodiment, the dragging of the predetermined calculation Average 120 may be initiated by a user in response to a touch input on a touch-enabled computing device, such as a tablet or touch slate type device, by tapping once (with a finger or stylus) on the predetermined calculation Average 120 to select it as a user interface element (e.g., a button) and then dragging the user interface element onto the content surface 105 towards the drop location 155. It should be understood that the examples discussed above may

also be applied to the dragging and dropping of custom calculations such as the Custom calculation 140.

[0019] In accordance with an embodiment, the drop location 155 may comprise a user-determined cell in a spreadsheet for displaying predetermined or custom calculations dragged from the status bar 117. The user interface 100 further includes a formula bar 150 which may be utilized to display the formula corresponding to a predetermined or custom calculation after the predetermined or custom calculation has been dropped onto the drop location 155.

[0020] FIGURE 2 is a computer screen display of the user interface 100 of FIGURE 1 showing a formula 220 which was generated following the dropping of predetermined calculation 120 at the drop location on the content surface 105, in accordance with an embodiment. In accordance with the present embodiment, the productivity application may generate the formula 220 in the formula bar 150 following the dropping of a predetermined calculation such, as the predetermined calculation Average 120, on the content surface 105.

[0021] FIGURE 3 is a computer screen display of a user interface 300 showing a predetermined calculation 320 being dragged from a status bar 317 to a drop location 355 on a content surface 305, in accordance with another embodiment. The user interface 300 may be generated by a productivity application executed by a computer and, as discussed above with respect to the user interface 100 of FIGURE 1, may include a client or web-based spreadsheet application, word processing software, presentation graphics software, diagramming software, project management software, publishing software and note-taking software. It should be appreciated that the aforementioned productivity applications may comprise individual application programs or alternatively, may be incorporated into a suite of productivity applications.

[0022] The content surface 305 in the user interface 300 may comprise a spreadsheet application worksheet (i.e., a spreadsheet) for displaying data values 315 (i.e., Weight) which may be displayed as a column in table in the content surface 305. The status bar 317 may display a number of predetermined calculations which are automatically generated from commonly used formulas based upon the data values 315. In accordance with an embodiment, the productivity application utilized for generating the content surface 305 may further be configured to automatically generate predetermined calculations which may include, but are not limited, to Average 320, Count 330 and Sum 340, on selected cells (i.e., the cells E3 through E26) containing the data values 315.

[0023] As briefly discussed above, the user interface 300 shows the predetermined calculation Average 320 being dragged from the status bar 317 to drop location 355 on the content surface 305. In accordance with an embodiment, the dragging of the predetermined calculation Average 320 from the status bar 317 may be initiated on a computing device in response to a user navigating pointer 345 to the predetermined calculation Average 320, using a computer input device (e.g., a mouse) to drag the predetermined calculation Average 320 onto the content surface 305 towards the drop location 355. In accordance with another embodiment, the dragging of the predetermined calculation Average 320 may be initiated by a user in response to a touch input on a touch-enabled computing device, such as a tablet or touch slate type device, by using a finger or stylus to drag the predetermined calculation Average 320 from the status bar 317 onto the content surface 305 towards the drop location 355. In accordance with yet another embodiment, the dragging of the predetermined calculation Average 320 may be initiated by a user in response to a touch input on a touch-enabled computing device, such as a tablet or touch slate type device, by tapping once (with a finger or stylus) on the predetermined calculation Average 320 to select it as a user interface element (e.g., a button) and then dragging the user interface element onto the content surface 305 towards the drop location 355. In accordance with an embodiment, the drop location 355 may comprise a user-determined cell in a spreadsheet for displaying predetermined calculations dragged from the status bar 317.

[0024] FIGURE 4 is a computer screen display of the user interface 300 showing a descriptive label 410 added to the display of a predetermined calculation at a drop location on the content surface 305, in accordance with an embodiment. In accordance with the present embodiment, the productivity application may automatically generate and display the descriptive label 410 "Average Weight" adjacent to the predetermined calculation Average 320 representing the average weight of the selected range comprising the cells E2:E26 on the content surface 305. Thus, it should be appreciated that, in accordance with an embodiment, if a currently selected range is part of a well-defined construct, such as a column in a table, the productivity application may be configured to insert a label in a cell adjacent to the cell that a predetermined calculation was dragged to from the status bar. It should be understood, however, that the productivity application may also be configured even if a currently selected range is not part of a well-defined construct. For example, the productivity application may be configured to label a calculation as

"Average," even if the productivity application is unable to determine whether or not a currently selected range is part of a table or has a defined structure.

[0025] FIGURE 5 is a flow diagram illustrating a routine 500 for inserting a formula at a location on a content surface in a user interface, in accordance with an embodiment. When reading the discussion of the routine presented herein, it should be appreciated that the logical operations of various embodiments are implemented (1) as a sequence of computer implemented acts or program modules running on a computing system and/or (2) as interconnected machine logical circuits or circuit modules within the computing system. The implementation is a matter of choice dependent on the performance requirements of the computing system implementing the various embodiments. Accordingly, the logical operations illustrated in FIGURE 5 and making up the various embodiments described herein are referred to variously as operations, structural devices, acts or modules. It will be recognized by one skilled in the art that these operations, structural devices, acts and modules may be implemented in software, in firmware, in special purpose digital logical, and any combination thereof without deviating from the spirit and scope of the various embodiments as recited within the claims set forth herein.

[0026] The routine 500 begins at operation 505, where a computing device may be utilized to execute a productivity application for receiving, in a user interface, a selection of a range of values on a content surface. In accordance with an embodiment, a user may select the range by using a computer input device (e.g., a mouse) to manually select a range of values on the content surface (e.g., a range of cells in a spreadsheet) or, alternatively, the user may select the range through the use of touch input which may include using a finger to select the range of values displayed on a tablet or mobile slate computing device.

[0027] From operation 505, the routine 500 continues to operation 510, where the productivity application executing on the computing device may display predetermined calculations in a user interface status bar. In particular, the productivity application may be configured to display a status bar which includes one or more aggregate function results which may include, without limitation, an average, a count, a minimum, a maximum, a numerical count and a sum.

[0028] From operation 510, the routine 500 continues to optional operation 512, where the productivity application executing on the computing device may add one or more custom calculations to the status bar in the user interface. As discussed above with respect to FIGURE 1, custom calculations may be the result of a user-created formula. In

accordance with an embodiment, custom calculations may be created by typing a formula in the productivity application and then dragging the formula to the status bar such that any range of values selected on the content surface would be automatically calculated according to the user-created formula.

[0029] From operation 512, the routine 500 continues to operation 515, where the productivity application executing on the computing device may receive a selection of a predetermined calculation in the status bar. For example, the productivity application may receive the selection of a predetermined calculation result indicating the average of numerical values in a group of currently selected cells in a spreadsheet.

[0030] From operation 515, the routine 500 continues to operation 520, where the productivity application executing on the computing device may drag the selected predetermined calculation from the status bar. In particular, the productivity application, after receiving an input from a computer input device or a touch input, may drag the selected predetermined calculation from the status bar to a "drop location" (e.g., a user-determined cell in a spreadsheet).

[0031] From operation 520, the routine 500 continues to operation 525, where the productivity application executing on the computing device may insert the selected predetermined calculation at a drop location on the content surface in the user interface. For example, the selected predetermined calculation may be dropped into a predetermined (i.e., predetermined by the user) cell in a spreadsheet.

[0032] From operation 525, the routine 500 continues to operation 530, where the productivity application executing on the computing device may automatically generate a formula corresponding to the selected predetermined calculation in the user interface. For example, as discussed above with respect to FIGURE 1, the productivity application may generate the formula in a formula bar in the user interface following the dropping of a predetermined calculation at the drop location on the content surface.

[0033] From operation 530, the routine 500 continues to operation 535, where the productivity application executing on the computing device may automatically insert a descriptive label in the content surface adjacent to the at least one predetermined calculation. For example, as discussed above with respect to FIGURE 4, if a currently selected range on the content surface is part of a well-defined construct, such as a column in a table, the productivity application may be configured to insert a label in a cell adjacent to the cell that a predetermined calculation was dragged to from the status bar. From operation 535, the routine 500 then ends.

[0034] FIGURE 6 is a block diagram illustrating example physical components of a computing device 600 with which various embodiments may be practiced. The computing device components described below may be suitable for the computing device described above with respect to FIGURE 5. In a basic configuration, the computing device 600 may include at least one processing unit 602 and a system memory 604. Depending on the configuration and type of computing device, system memory 604 may comprise, but is not limited to, volatile (e.g. random access memory (RAM)), non-volatile (e.g. read-only memory (ROM)), flash memory, or any combination. System memory 604 may include an operating system 605 and productivity application 601. Operating system 605, for example, may be suitable for controlling computing device 600's operation and, in accordance with an embodiment, may comprise the WINDOWS operating systems from MICROSOFT CORPORATION of Redmond, Washington. It should be understood that the embodiments described herein may also be practiced in conjunction with other operating systems and application programs and further, is not limited to any particular application or system.

[0035] The computing device 600 may have additional features or functionality. For example, the computing device 600 may also include additional data storage devices (removable and/or non-removable) such as, for example, magnetic disks, optical disks, or tape. Such additional storage is illustrated in FIGURE 6 by a removable storage 609 and a non-removable storage 610.

[0036] While executing on the processing unit 602 of the computing device 600, the productivity application 601 may perform a routine for inserting a formula at a location on a content surface in a user interface including, for example, one or more of the operations in the routine 500 described above. The aforementioned routine is illustrative, and the processing unit 602 may perform other routines. Generally, consistent with various embodiments, program modules may be provided which include routines, programs, components, data structures, and other types of structures that may perform particular tasks or that may implement particular abstract data types. Moreover, various embodiments may be practiced with other computer system configurations, including hand-held devices, multiprocessor systems, microprocessor-based or programmable consumer electronics, minicomputers, mainframe computers, and the like. Various embodiments may also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications

network. In a distributed computing environment, program modules may be located in both local and remote memory storage devices.

[0037] Furthermore, various embodiments may be practiced in an electrical circuit comprising discrete electronic elements, packaged or integrated electronic chips containing logic gates, a circuit utilizing a microprocessor, or on a single chip containing electronic elements or microprocessors. For example, various embodiments may be practiced via a system-on-a-chip ("SOC") where each or many of the components illustrated in FIGURE 6 may be integrated onto a single integrated circuit. Such an SOC device may include one or more processing units, graphics units, communications units, system virtualization units and various application functionality all of which are integrated (or "burned") onto the chip substrate as a single integrated circuit. When operating via an SOC, the functionality, described herein, with respect to the productivity application 601 may operate via application-specific logic integrated with other components of the computing device/system 600 on the single integrated circuit (chip). Embodiments may also be practiced using other technologies capable of performing logical operations such as, for example, AND, OR, and NOT, including but not limited to mechanical, optical, fluidic, and quantum technologies. In addition, embodiments may be practiced within a general purpose computer or in any other circuits or systems.

[0038] Various embodiments, for example, may be implemented as a computer process (method), a computing system, or as an article of manufacture, such as a computer program product or computer readable media. The computer program product may be a computer storage media readable by a computer system and encoding a computer program of instructions for executing a computer process.

[0039] The term computer readable media as used herein may include computer storage media. Computer storage media may include volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information, such as computer readable instructions, data structures, program modules, or other data. The system memory 604, removable storage 609, and non-removable storage 610 are all computer storage media examples (i.e., memory storage.) Computer storage media may include, but is not limited to, RAM, ROM, electrically erasable read-only memory (EEPROM), flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store information and which can be accessed by the computing device 600.

Any such computer storage media may be part of the computing device 600. The computing device 600 may also have input device(s) 612 such as a keyboard, a mouse, a pen, a sound input device, a touch input device, etc. Output device(s) 614 such as a display, speakers, a printer, etc. may also be included. The aforementioned devices are examples and others may be used.

[0040] The term computer readable media as used herein may also include communication media. Communication media may be embodied by computer readable instructions, data structures, program modules, or other data in a modulated data signal, such as a carrier wave or other transport mechanism, and includes any information delivery media. The term "modulated data signal" may describe a signal that has one or more characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media may include wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, radio frequency (RF), infrared, and other wireless media.

[0041] FIGURES 7A and 7B illustrate a suitable mobile computing environment, for example, a mobile computing device 750, a smartphone, a tablet personal computer, a laptop computer, and the like, with which various embodiments may be practiced. With reference to FIG. 7A, an example mobile computing device 750 for implementing the embodiments is illustrated. In a basic configuration, mobile computing device 750 is a handheld computer having both input elements and output elements. Input elements may include touch screen display 725 and input buttons 710 that allow the user to enter information into mobile computing device 750. Mobile computing device 750 may also incorporate an optional side input element 720 allowing further user input. Optional side input element 720 may be a rotary switch, a button, or any other type of manual input element. In alternative embodiments, mobile computing device 750 may incorporate more or less input elements. For example, display 725 may not be a touch screen in some embodiments. In yet another alternative embodiment, the mobile computing device is a portable phone system, such as a cellular phone having display 725 and input buttons 710. Mobile computing device 750 may also include an optional keypad 705. Optional keypad 705 may be a physical keypad or a "soft" keypad generated on the touch screen display.

[0042] Mobile computing device 750 incorporates output elements, such as display 725, which can display a graphical user interface (GUI). Other output elements include speaker 730 and LED light 726. Additionally, mobile computing device 750 may

incorporate a vibration module (not shown), which causes mobile computing device 750 to vibrate to notify the user of an event. In yet another embodiment, mobile computing device 750 may incorporate a headphone jack (not shown) for providing another means of providing output signals.

[0043] Although described herein in combination with mobile computing device 750, in alternative embodiments may be used in combination with any number of computer systems, such as in desktop environments, laptop or notebook computer systems, multiprocessor systems, micro-processor based or programmable consumer electronics, network PCs, mini computers, main frame computers and the like. Various embodiments may also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications network in a distributed computing environment; programs may be located in both local and remote memory storage devices. To summarize, any computer system having a plurality of environment sensors, a plurality of output elements to provide notifications to a user and a plurality of notification event types may incorporate the various embodiments described herein.

[0044] FIG. 7B is a block diagram illustrating components of a mobile computing device used in one embodiment, such as the mobile computing device 750 shown in FIG. 7A. That is, mobile computing device 750 can incorporate a system 702 to implement some embodiments. For example, system 702 can be used in implementing a "smart phone" that can run one or more applications similar to those of a desktop or notebook computer such as, for example, the productivity application discussed above with respect to FIGURES 1-6 as well as other applications. In some embodiments, the system 702 is integrated as a computing device, such as an integrated personal digital assistant (PDA) and wireless phone.

[0045] A productivity application 767 may be loaded into memory 762 and run on or in association with an operating system 764. The spreadsheet application 767 may be perform a routine for inserting a formula at a location on a content surface in a user interface including, for example, one or more of the operations in routine 500 described above. The system 702 also includes non-volatile storage 768 within memory the 762. Non-volatile storage 768 may be used to store persistent information that should not be lost if system 702 is powered down. The productivity application 767 may use and store information in the non-volatile storage 768. A synchronization application (not shown) also resides on system 702 and is programmed to interact with a corresponding

synchronization application resident on a host computer to keep the information stored in the non-volatile storage 768 synchronized with corresponding information stored at the host computer. As should be appreciated, other applications may also be loaded into the memory 762 and run on the mobile computing device 750.

[0046] The system 702 has a power supply 770, which may be implemented as one or more batteries. The power supply 770 might further include an external power source, such as an AC adapter or a powered docking cradle that supplements or recharges the batteries.

[0047] The system 702 may also include a radio 772 that performs the function of transmitting and receiving radio frequency communications. The radio 772 facilitates wireless connectivity between the system 702 and the "outside world," via a communications carrier or service provider. Transmissions to and from the radio 772 are conducted under control of OS 764. In other words, communications received by the radio 772 may be disseminated to the productivity application 767 via OS 764, and vice versa.

[0048] The radio 772 allows the system 702 to communicate with other computing devices, such as over a network. The radio 772 is one example of communication media. The embodiment of the system 702 is shown with two types of notification output devices: an LED 726 that can be used to provide visual notifications and an audio interface 774 that can be used with speaker 730 to provide audio notifications. These devices may be directly coupled to the power supply 770 so that when activated, they remain on for a duration dictated by the notification mechanism even though processor 760 and other components might shut down for conserving battery power. The LED 726 may be programmed to remain on indefinitely until the user takes action to indicate the powered-on status of the device. The audio interface 774 is used to provide audible signals to and receive audible signals from the user. For example, in addition to being coupled to speaker 730, the audio interface 774 may also be coupled to a microphone (not shown) to receive audible input, such as to facilitate a telephone conversation. In accordance with embodiments, the microphone may also serve as an audio sensor to facilitate control of notifications. The system 702 may further include a video interface 776 that enables an operation of on-board camera 730 to record still images, video stream, and the like.

[0049] A mobile computing device implementing the system 702 may have additional features or functionality. For example, the device may also include additional data

storage devices (removable and/or non-removable) such as, magnetic disks, optical disks, or tape. Such additional storage is illustrated in FIG. 7B by storage 768.

[0050] Data/information generated or captured by the mobile computing device 750 and stored via the system 702 may be stored locally on the mobile computing device 750, as described above, or the data may be stored on any number of storage media that may be accessed by the device via the radio 772 or via a wired connection between the mobile computing device 750 and a separate computing device associated with the mobile computing device 750, for example, a server computer in a distributed computing network such as the Internet. As should be appreciated such data/information may be accessed via the mobile computing device 750 via the radio 772 or via a distributed computing network. Similarly, such data/information may be readily transferred between computing devices for storage and use according to well-known data/information transfer and storage means, including electronic mail and collaborative data/information sharing systems.

[0051] FIGURE 8 is a simplified block diagram of a distributed computing system in which various embodiments may be practiced. The distributed computing system may include number of client devices such as a computing device 805, a tablet computing device 803 and a mobile computing device 810. The client devices 805, 803 and 810 may be in communication with a distributed computing network 815 (e.g., the Internet). A server 820 is in communication with the client devices 805, 803 and 810 over the network 815. The server 820 may store productivity application 800 which may be utilized to perform a routine for inserting a formula at a location on a content surface in a user interface including, for example, one or more of the operations in routine 500 described above. The productivity application 800 on the server 820 may be utilized by the client devices 805, 803 and 810 (over the network 815) to generate electronic documents and for storing same in a store 816.

[0052] Various embodiments are described above with reference to block diagrams and/or operational illustrations of methods, systems, and computer program products. The functions/acts noted in the blocks may occur out of the order as shown in any flow diagram. For example, two blocks shown in succession may in fact be executed substantially concurrently or the blocks may sometimes be executed in the reverse order, depending upon the functionality/acts involved.

[0053] While certain embodiments have been described, other embodiments may exist. Furthermore, although various embodiments have been described as being associated with data stored in memory and other storage mediums, data can also be stored

on or read from other types of computer-readable media, such as secondary storage devices (i.e., hard disks, floppy disks, or a CD-ROM), a carrier wave from the Internet, or other forms of RAM or ROM. Further, the disclosed routines' operations may be modified in any manner, including by reordering operations and/or inserting or operations, without departing from the embodiments described herein.

[0054] It will be apparent to those skilled in the art that various modifications or variations may be made without departing from the scope or spirit of the embodiments described herein. Other embodiments will be apparent to those skilled in the art from consideration of the specification and practice of the embodiments described herein.

CLAIMS

WHAT IS CLAIMED IS:

1. A computer-implemented method for inserting a formula at a location on a content surface in a user interface, comprising:

displaying in the user interface, by a computer, a status bar comprising at least one predetermined calculation;

receiving in the user interface, by the computer, a selection of the at least one predetermined calculation in the status bar;

dragging in the user interface, by the computer, the selected at least one predetermined calculation from the status bar;

inserting in the user interface, by the computer, the selected at least one predetermined calculation at a drop location on the content surface; and

automatically generating in the user interface, by the computer, a formula corresponding to the selected at least one predetermined calculation.

2. The method of claim 1, further comprising receiving, in the user interface, a selection of a range of values on the content surface prior to displaying in the user interface, by a computer, a status bar comprising at least one predetermined calculation.

3. The method of claim 1, further comprising automatically inserting a descriptive label in the content surface adjacent to the at least one predetermined calculation.

4. The method of claim 1, further comprising adding at least one custom calculation to the status bar in the user interface.

5. The method of claim 4, wherein adding at least one custom calculation to the status bar in the user interface comprises dragging at least one custom formula to the status bar.

6. The method of claim 1, wherein displaying in the user interface, by a computer, a status bar comprising at least one predetermined calculation comprises displaying at least one aggregate function result.

7. The method of claim 6, wherein displaying at least one aggregate function result comprises displaying at least one function result selected from a group comprising: an average, a count, a minimum, a maximum, a numerical count and a sum.

8. The method of claim 1, wherein inserting in the user interface, by the computer, the selected at least one predetermined calculation at a drop location on the

content surface comprises inserting the selected at least one predetermined calculation into a cell in a spreadsheet.

9. A computer system for inserting a formula at a location on a content surface in a user interface, comprising:

a memory for storing executable program code; and

a processor, functionally coupled to the memory, the processor being responsive to computer-executable instructions contained in the program code and operative to:

receive, in the user interface, a selection of a range of values on the content surface;

display, in the user interface a status bar comprising at least one predetermined calculation;

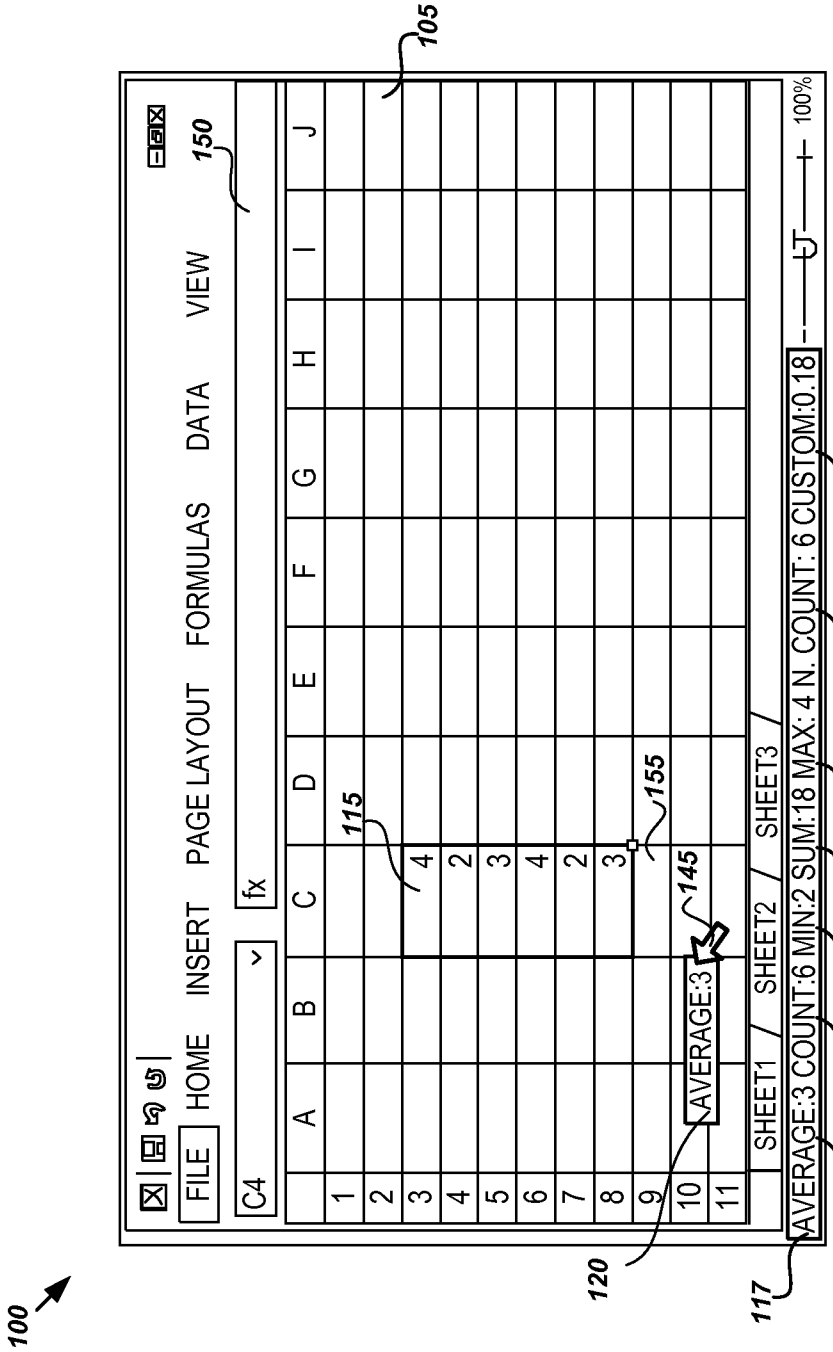
receive, in the user interface a selection of the at least one predetermined calculation in the status bar;

drag, in the user interface, the selected at least one predetermined calculation from the status bar;

insert, in the user interface, the selected at least one predetermined calculation at a drop location on the content surface; and

automatically generate, in the user interface, a formula corresponding to the selected at least one predetermined calculation.

10. The system of claim 9, wherein the processor is further operative to automatically insert, in the user interface, a descriptive label in the content surface adjacent to the at least one predetermined calculation.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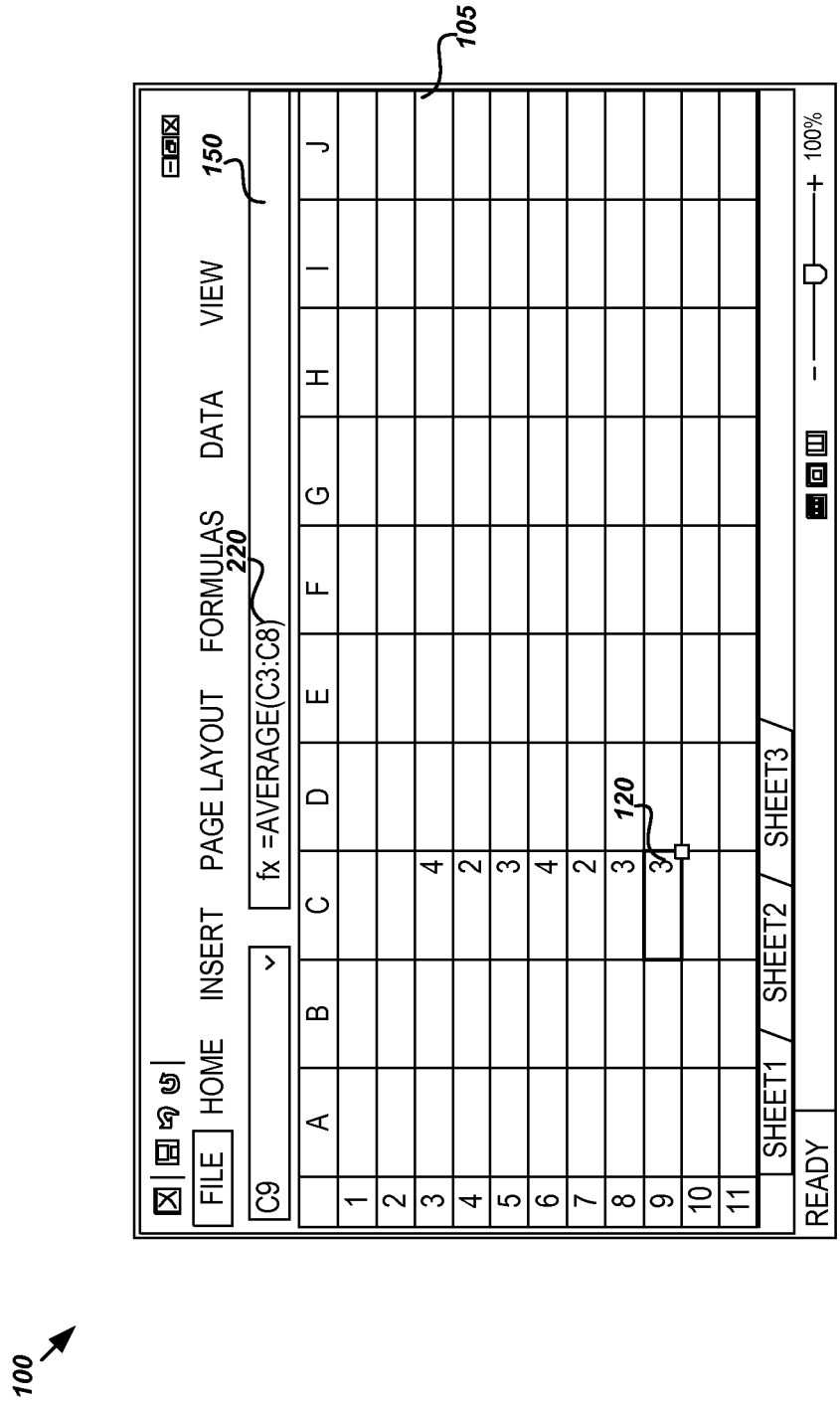
105
150
115
155
145
120
117
FILE
HOME
INSERT
PAGE LAYOUT
FORMULAS
DATA
VIEW
C4
fx
AVERAGE:3
SHEET1
SHEET2
SHEET3
AVERAGE:3 COUNT:6 MIN:2 SUM:18 MAX: 4 N. COUNT: 6 CUSTOM:0.18
100%
120
125
130
135
137
139
140

FIG. 1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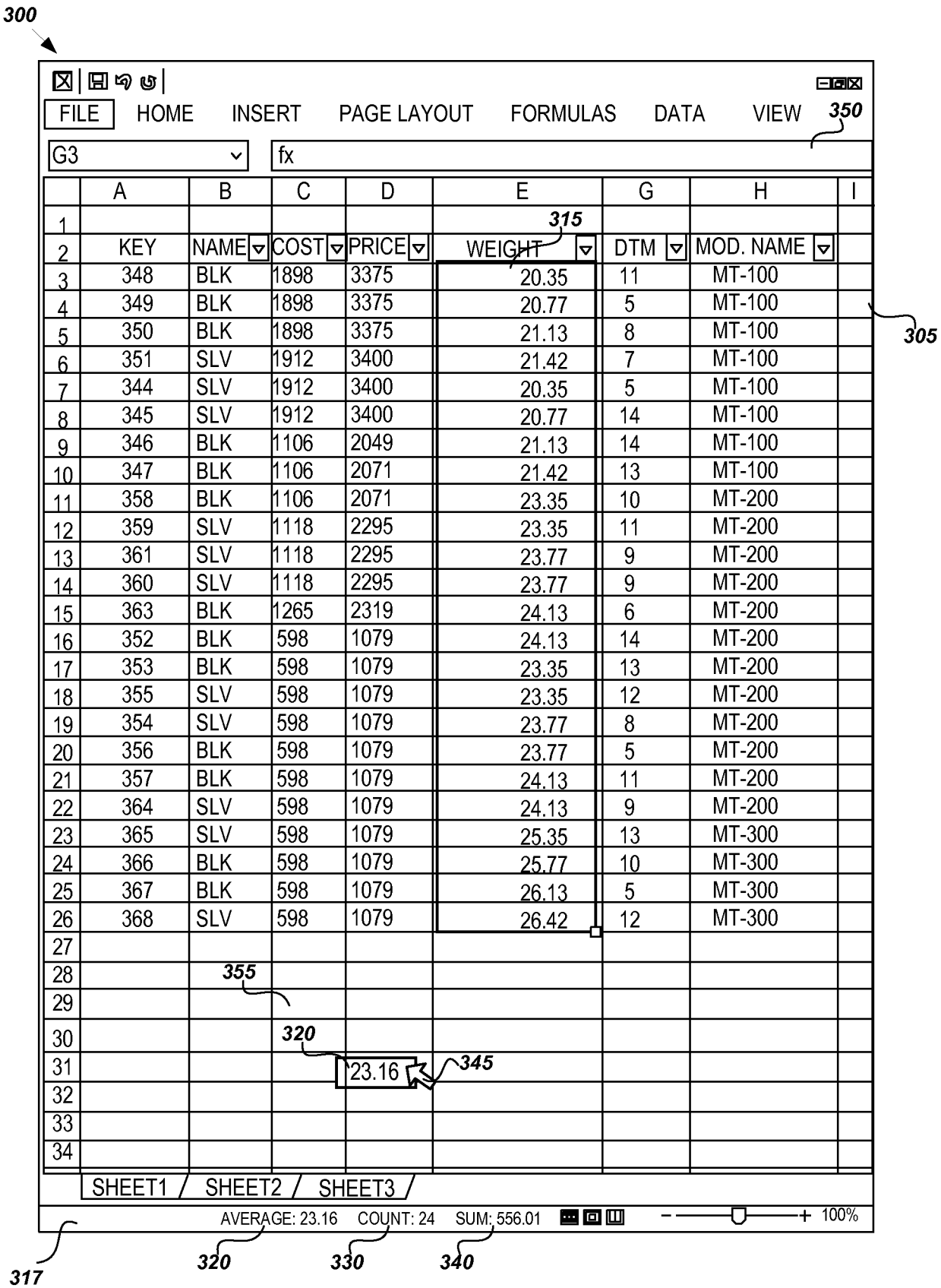
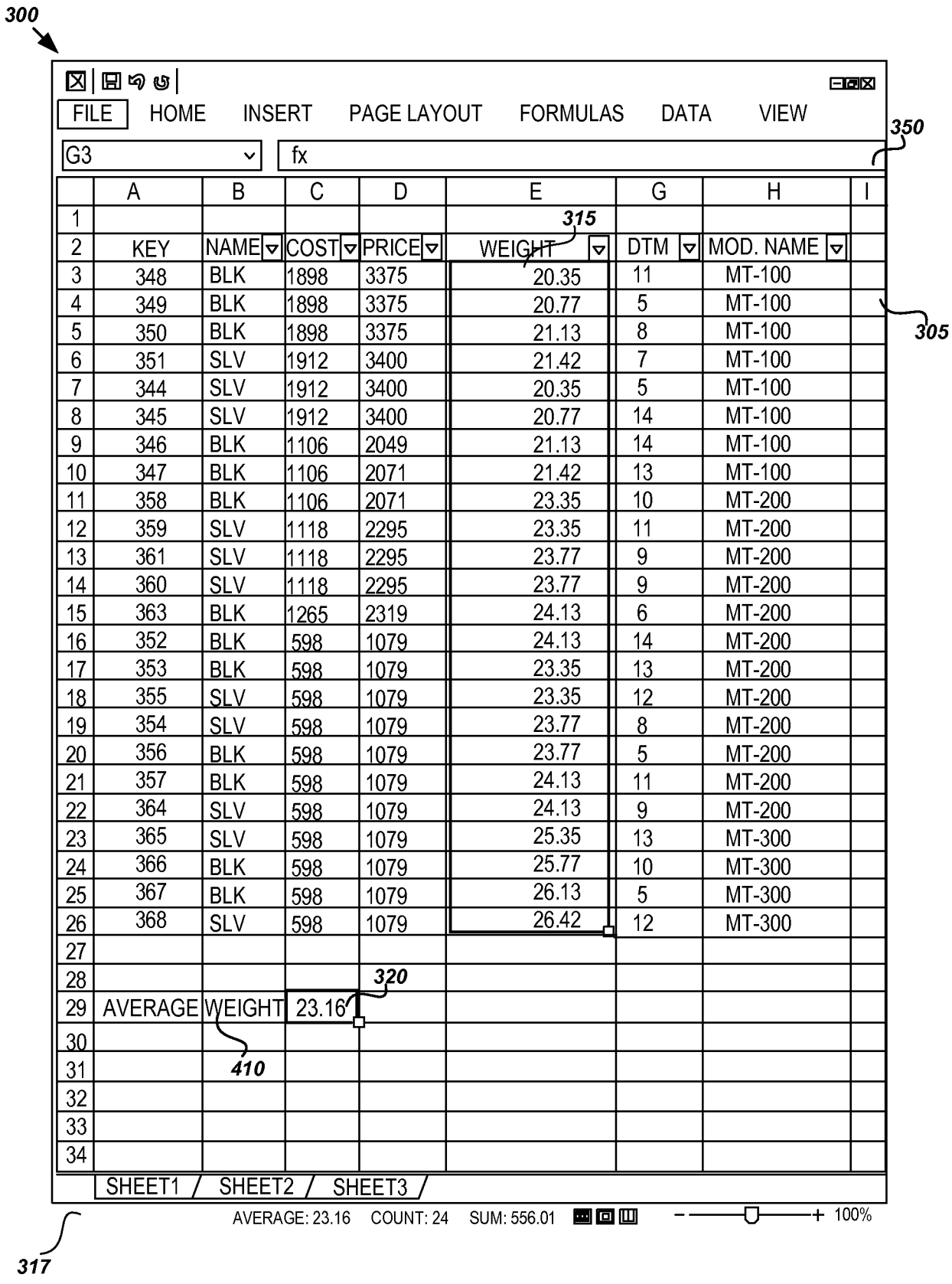
220
120
FILE
HOME
INSERT
PAGE LAYOUT
FORMULAS
DATA
VIEW
C9
fx =AVERAGE(C3:C8)
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
4
2
3
4
2
3
3
SHEET1
SHEET2
SHEET3
READY
100%

FIG. 2



	A	B	C	D	E	G	H	I
1								
2	KEY	NAME	COST	PRICE	WEIGHT	DTM	MOD. NAME	
3	348	BLK	1898	3375	20.35	11	MT-100	
4	349	BLK	1898	3375	20.77	5	MT-100	
5	350	BLK	1898	3375	21.13	8	MT-100	
6	351	SLV	1912	3400	21.42	7	MT-100	
7	344	SLV	1912	3400	20.35	5	MT-100	
8	345	SLV	1912	3400	20.77	14	MT-100	
9	346	BLK	1106	2049	21.13	14	MT-100	
10	347	BLK	1106	2071	21.42	13	MT-100	
11	358	BLK	1106	2071	23.35	10	MT-200	
12	359	SLV	1118	2295	23.35	11	MT-200	
13	361	SLV	1118	2295	23.77	9	MT-200	
14	360	SLV	1118	2295	23.77	9	MT-200	
15	363	BLK	1265	2319	24.13	6	MT-200	
16	352	BLK	598	1079	24.13	14	MT-200	
17	353	BLK	598	1079	23.35	13	MT-200	
18	355	SLV	598	1079	23.35	12	MT-200	
19	354	SLV	598	1079	23.77	8	MT-200	
20	356	BLK	598	1079	23.77	5	MT-200	
21	357	BLK	598	1079	24.13	11	MT-200	
22	364	SLV	598	1079	24.13	9	MT-200	
23	365	SLV	598	1079	25.35	13	MT-300	
24	366	BLK	598	1079	25.77	10	MT-300	
25	367	BLK	598	1079	26.13	5	MT-300	
26	368	SLV	598	1079	26.42	12	MT-300	
27								
28								
29								
30								
31								
32								
33								
34								

FIG. 3



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1								
2	KEY	NAME	COST	PRICE	WEIGHT	DTM	MOD. NAME	
3	348	BLK	1898	3375	20.35	11	MT-100	
4	349	BLK	1898	3375	20.77	5	MT-100	
5	350	BLK	1898	3375	21.13	8	MT-100	
6	351	SLV	1912	3400	21.42	7	MT-100	
7	344	SLV	1912	3400	20.35	5	MT-100	
8	345	SLV	1912	3400	20.77	14	MT-100	
9	346	BLK	1106	2049	21.13	14	MT-100	
10	347	BLK	1106	2071	21.42	13	MT-100	
11	358	BLK	1106	2071	23.35	10	MT-200	
12	359	SLV	1118	2295	23.35	11	MT-200	
13	361	SLV	1118	2295	23.77	9	MT-200	
14	360	SLV	1118	2295	23.77	9	MT-200	
15	363	BLK	1265	2319	24.13	6	MT-200	
16	352	BLK	598	1079	24.13	14	MT-200	
17	353	BLK	598	1079	23.35	13	MT-200	
18	355	SLV	598	1079	23.35	12	MT-200	
19	354	SLV	598	1079	23.77	8	MT-200	
20	356	BLK	598	1079	23.77	5	MT-200	
21	357	BLK	598	1079	24.13	11	MT-200	
22	364	SLV	598	1079	24.13	9	MT-200	
23	365	SLV	598	1079	25.35	13	MT-300	
24	366	BLK	598	1079	25.77	10	MT-300	
25	367	BLK	598	1079	26.13	5	MT-300	
26	368	SLV	598	1079	26.42	12	MT-300	
27								
28								
29	AVERAGE	WEIGHT	23.16					
30								
31								
32								
33								
34								

FIG. 4

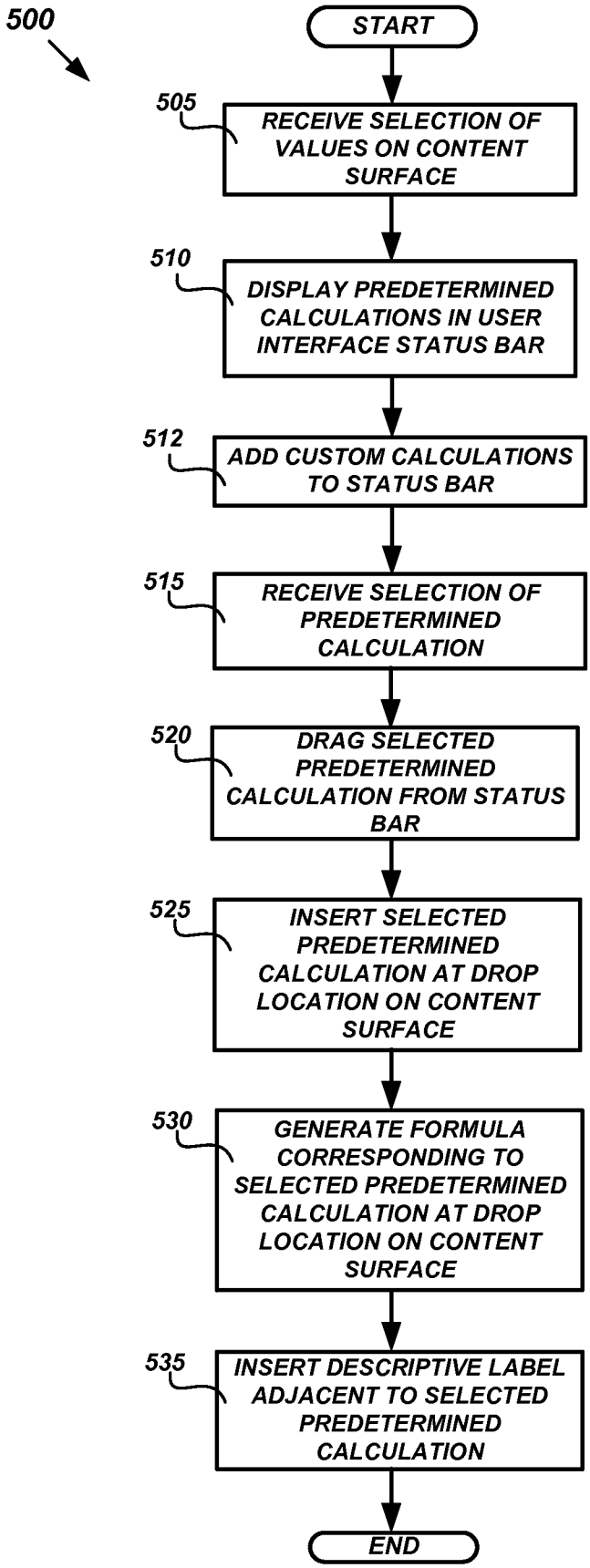
500
START
505
RECEIVE SELECTION OF VALUES ON CONTENT SURFACE
510
DISPLAY PREDETERMINED CALCULATIONS IN USER INTERFACE STATUS BAR
512
ADD CUSTOM CALCULATIONS TO STATUS BAR
515
RECEIVE SELECTION OF PREDETERMINED CALCULATION
520
DRAG SELECTED PREDETERMINED CALCULATION FROM STATUS BAR
525
INSERT SELECTED PREDETERMINED CALCULATION AT DROP LOCATION ON CONTENT SURFACE
530
GENERATE FORMULA CORRESPONDING TO SELECTED PREDETERMINED CALCULATION AT DROP LOCATION ON CONTENT SURFACE
535
INSERT DESCRIPTIVE LABEL ADJACENT TO SELECTED PREDETERMINED CALCULATION
END

FIG. 5

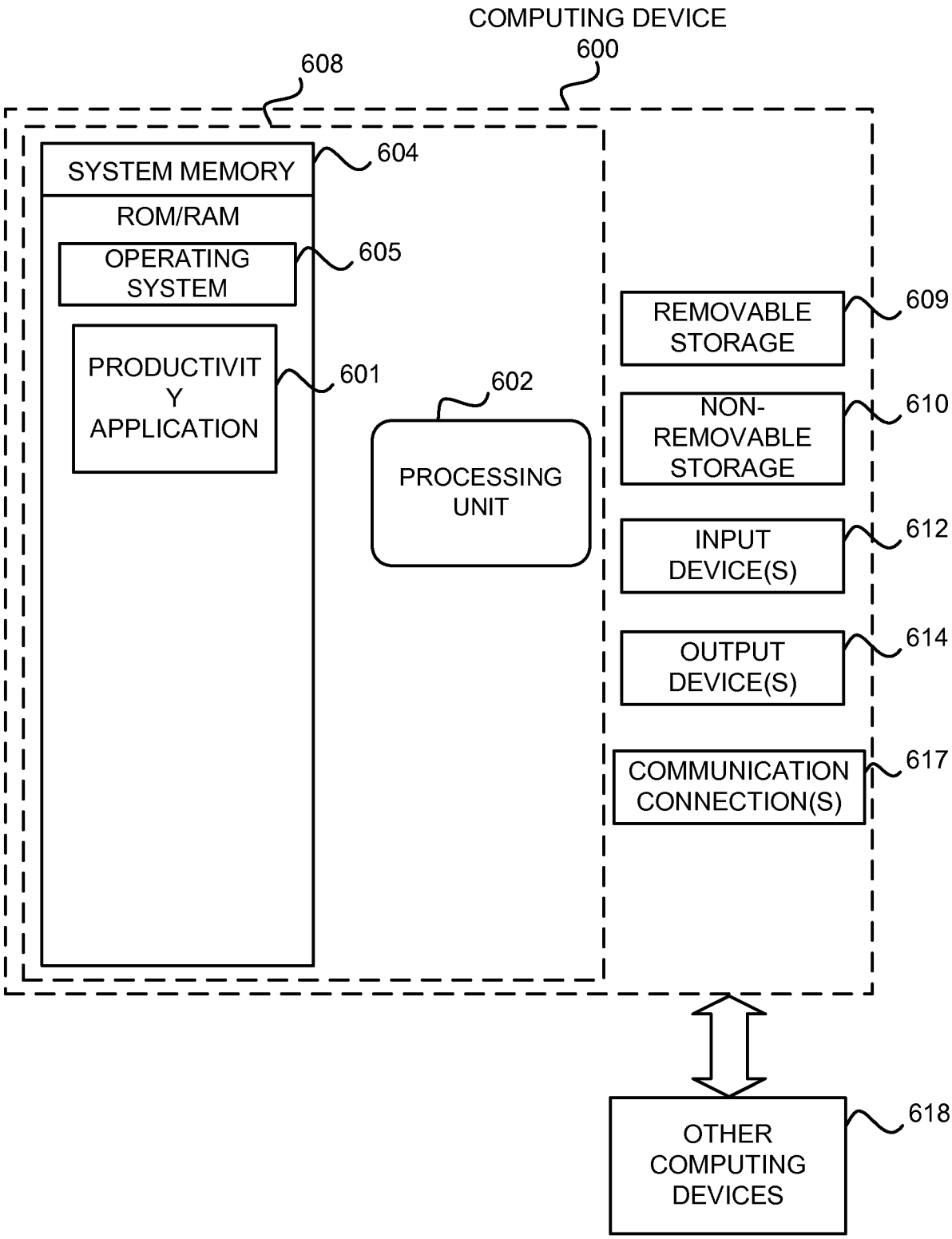
COMPUTING DEVICE
600
608
SYSTEM MEMORY
604
ROM/RAM
OPERATING SYSTEM
605
PRODUCTIVITY APPLICATION
601
602
PROCESSING UNIT
REMOVABLE STORAGE
609
NON-REMOVABLE STORAGE
610
INPUT DEVICE(S)
612
OUTPUT DEVICE(S)
614
COMMUNICATION CONNECTION(S)
617
OTHER COMPUTING DEVICES
618

FIG. 6

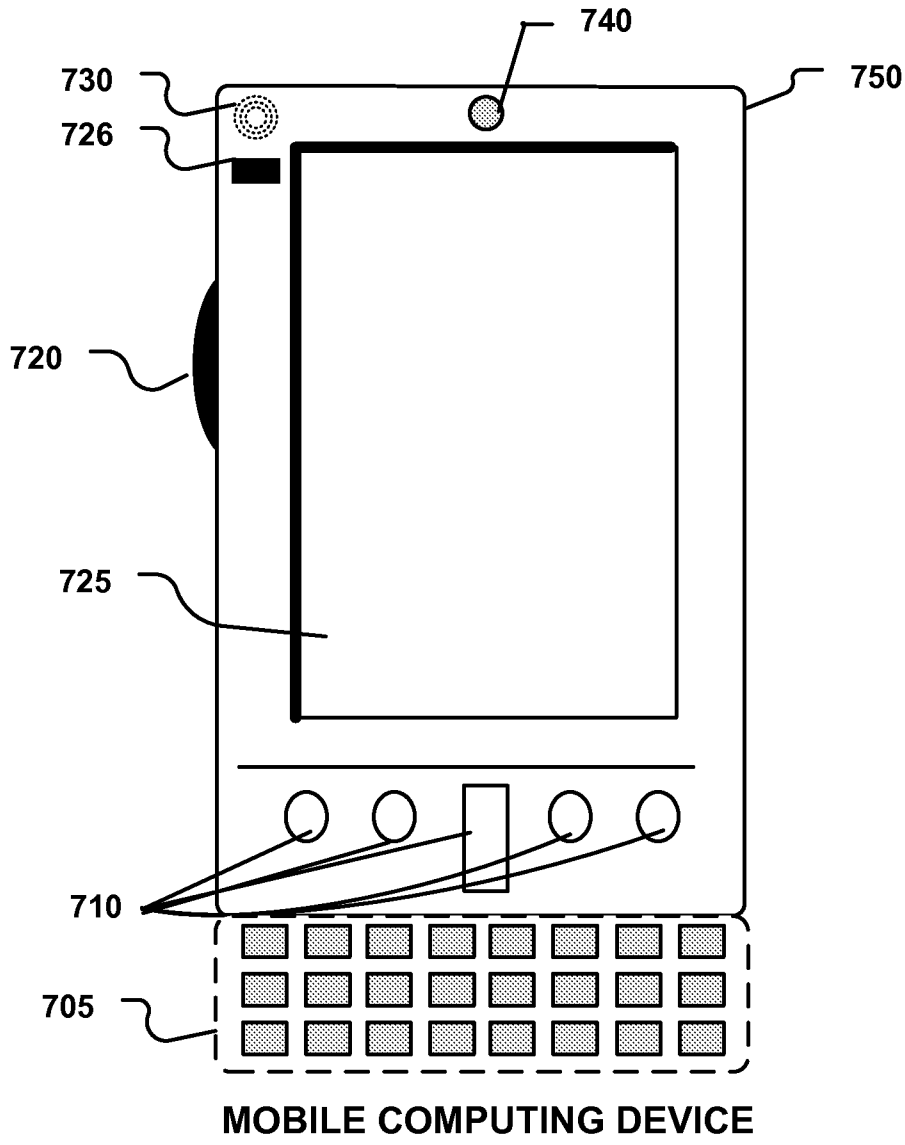

FIG. 7A

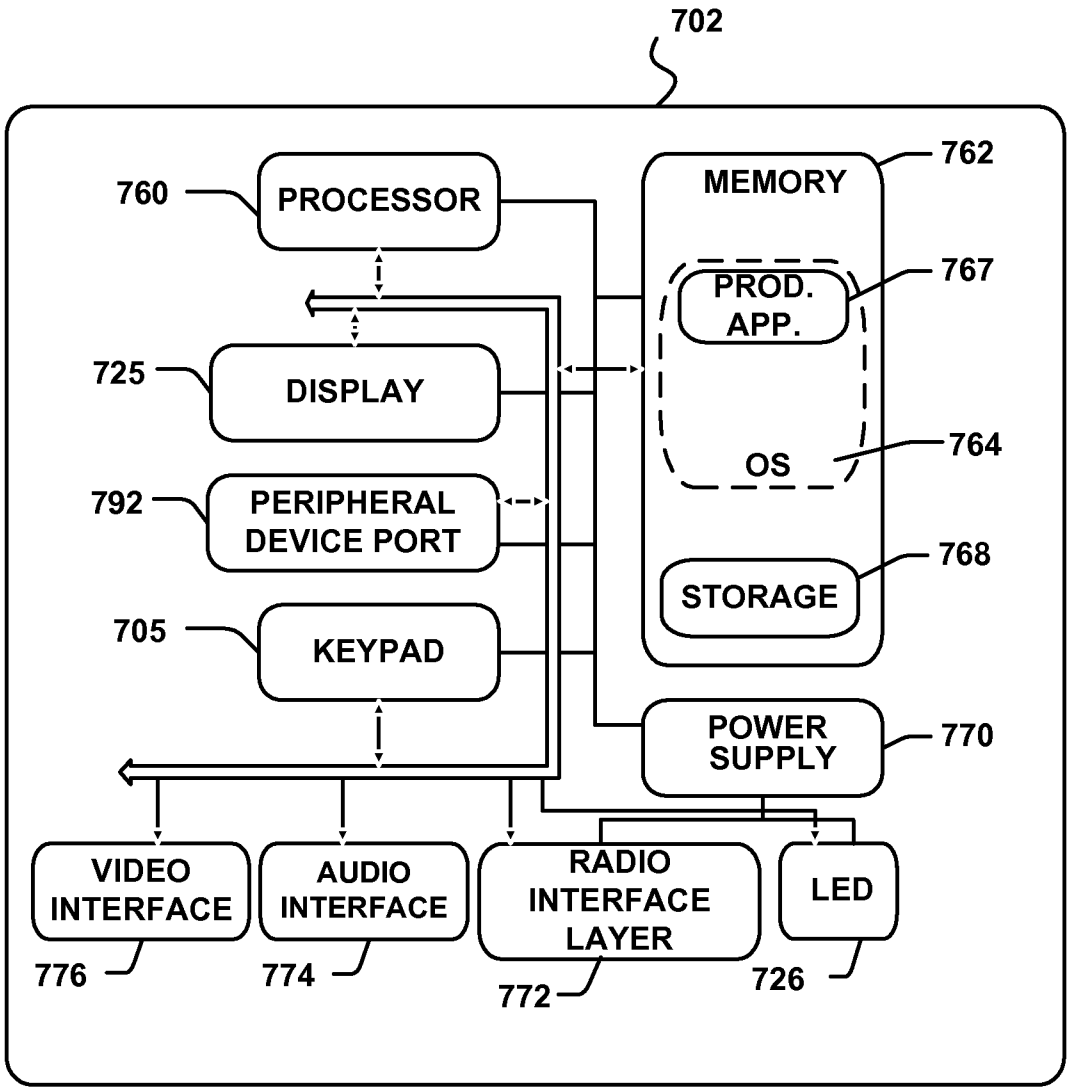
702
760
PROCESSOR
MEMORY
762
PROD. APP.
767
725
DISPLAY
OS
764
792
PERIPHERAL DEVICE PORT
768
STORAGE
705
KEYPAD
POWER SUPPLY
770
VIDEO INTERFACE
AUDIO INTERFACE
RADIO INTERFACE LAYER
LED
776
774
772
726

FIG. 7B

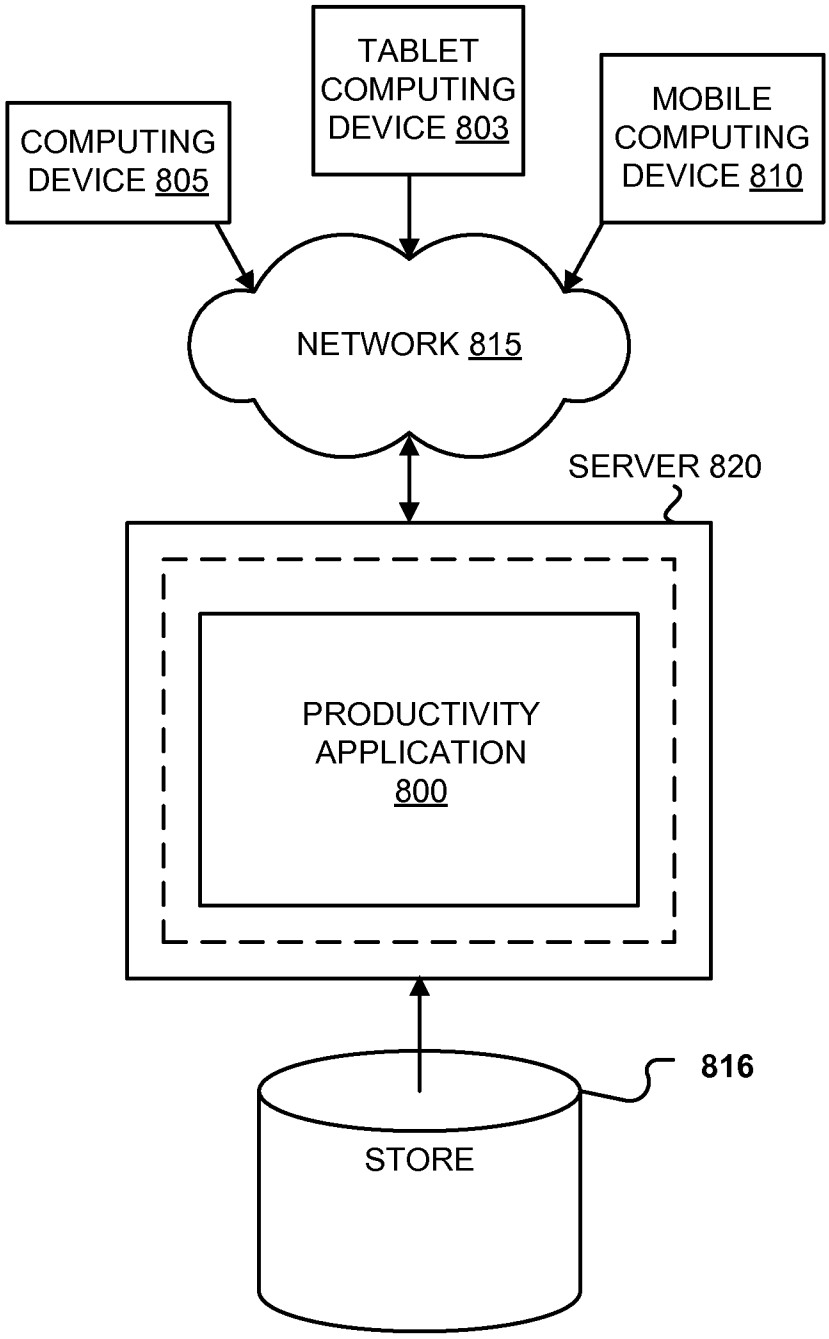
TABLET COMPUTING DEVICE 803
COMPUTING DEVICE 805
MOBILE COMPUTING DEVICE 810
NETWORK 815
SERVER 820
PRODUCTIVITY APPLICATION 800
816
STORE

FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/061583

A. CLASSIFICATION OF SUBJECT MATTER

G06F 3/048(2006.01)i, G06F 3/14(2006.01)i, G06F 9/44(2006.01)i, G06F 17/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06F 3/048; G06F 15/16; G06F 17/00; G06F 17/21; G06F 7/60

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & keywords: build, formula, bar, drag, and similar terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6430584 B1 (COMER, ROSS et al.) 6 August 2002 See col. 5, lines 22-37, col. 6, lines 31-47; claims 1 and 2; figures 3 and 4.	1-10
A	US 2007-0244672 A1 (KJAER, HENRIK) 18 October 2007 See paragraphs [0104]-[0105] and [0163]-[0164]; and figure 28.	1-10
A	US 2007-0061698 A1 (MEGIDDO, ERAN et al.) 15 March 2007 See paragraphs [0066] and [0068]; and figure 2.	1-10
A	US 2006-0129929 A1 (WEBER, BRANDON G. et al.) 15 June 2006 See paragraph [0069]; and figure 11.	1-10
A	US 2007-0233811 A1 (ROCHELLE, JONATHAN et al.) 4 October 2007 See paragraph [0039]; and figure 5.	1-10

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 FEBRUARY 2013 (27.02.2013)	**28 FEBRUARY 2013 (28.02.2013)**
Name and mailing address of the ISA/KR Facsimile No. 82-42-472-7140	Authorized officer LEE, Dong Yun Telephone No. 82-42-481-8734

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/061583

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		DK 1685500T3	04.05.2009
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		WO 2005-043406 A3	23.06.2005
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		WO 2007-030769 A2	15.03.2007
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		ZA 200802171 A	26.08.2009
US 2006-0129929 A1	15.06.2006	AU 2005-225040 A1	29.06.2006
		AU 2005-225040 B2	15.07.2010
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		CA 2525986 A1	15.06.2006
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		EP 1672527 A3	10.06.2009
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		KR 10-2006-0067813 A	20.06.2006
		MX PA05012292 A	19.06.2006
		MY 145252 A	13.01.2012
		RU 2005135427 A	27.05.2007
		US 7451397 B2	11.11.2008
		ZA 200509136 A	30.04.2008
US 2007-0233811 A1	04.10.2007	AU 2007-233090 A1	11.10.2007
		BR PI0709656 A2	19.07.2011
		CA 2648043 A1	11.10.2007
		CN 101454774 A	10.06.2009
		EP 2002359 A1	17.12.2008

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/061583

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		JP 2009-532778 A	10.09.2009
		JP 5005026 B2	01.06.2012
		KR 10-1044684 B1	28.06.2011
		KR 10-2009-0007365 A	16.01.2009
		US 8307119 B2	06.11.2012
		WO 2007-115149 A1	11.10.2007