

## DISPLAY UNIT WITH TOUCH PANEL AND INFORMATION PROCESSING METHOD

### BACKGROUND OF THE INVENTION

[0001] The present invention relates to a display unit with a touch panel which is used in a terminal device such as a desk top type, a portable device and the like.

[0002] In recent years, terminal devices have been used more and more widely in a variety of businesses. For example, automatic teller machines (ATM) have been installed in banks and the like, while automatic ticket vending machines and map guiding machines have been installed in stations and the like, so that some of businesses involved in the banks, stations and the like can also be processed on the terminal devices. In addition, establishments such as fast food restaurants also employ terminal devices for processing orders of articles made by customers (for example, see JP-A-5-216587). Moreover, there have been practiced or proposed a terminal device for receiving delivered contents, and a terminal device for browsing web sites utilizing a communication network such as the Internet.

[0003] Such a terminal device as mentioned above is provided with a display unit which displays information such as a message presented on its display screen, so that a user operates an input means such as a keyboard, while viewing the information, to proceed with a variety of operations as mentioned. There has been a growing trend to employ a display device with a touch panel on a display screen, which has functions of input means, permitting the user to make operations on the screen in accordance with messages, menus and the like displayed thereon to execute a variety of operations.

[0004] Such a display unit with a touch panel allows the user to directly touch his finger tip on the display screen for operations, thereby providing a high operability which includes easy operations and less errors in operations. In addition, since the number of functional buttons can be reduced in an input unit such as a keyboard, the terminal device itself can be reduced in size, resulting in advantages such as a reduction in the area required for installation, a higher degree of freedom for a place at which the terminal device is installed in a store, a precinct, or the like.

[0005] A conventional display unit with a touch panel, however, displays an image representative of an input device comprised of touch-driven members such as functional buttons (touch buttons) on its display screen such that a customer or user visually recognizes the input device, and under this recognition touches a desired position on the image representative of the input device, causing the display device to execute predetermined processing associated with the touched position.

[0006] A personal computer is provided with a mouse-based drag-and-drop function. Since the user can freely move the cursor through the mouse and push a click button (buttons), the user can move an icon with the click button held down, or place the cursor on an icon and double clicks the click button to instruct the personal computer to execute a preset function associated with the icon.

[0007] However, since the conventional touch panel, by sensing one touch at a time, executes each process only one process can be executed. For example, with a display unit

with a touch panel, typically employed in ATM and the like, as the user touches a touch-driven member on a display screen, a function associated with the touch-driven member is activated at this time, so that the user cannot perform the drag-and-drop function through a touch operation. While some compact information devices with a touch panel provide the drag-and-drop function, these devices require the user to touch an icon twice at preset timings in order to activate a function previously associated with the icon. With operations on a mouse, the user indirectly operates the mouse while viewing the cursor displayed on the display screen, so that no serious problems arise in the visibility and operability. On the contrary, a touch panel, which forces the user to directly handle a touch-driven member displayed on a display screen, implies challenges in the prevention of erroneous operations and the operability because the user must touch a position once touched by him again at the same timing. Particularly, when public devices are concerned, such as ATM, automatic machines, and the like which can be operated by indefinite users, a problem still remains in forcing every user to touch a position twice at the same timing.

### SUMMARY OF THE INVENTION

[0008] To solve the problem mentioned above, it is an object of the present invention to provide a display unit with a touch panel which is capable of arbitrarily moving a touch-driven member such as a functional button to a position desired by a user, and is capable of activating a function previously set to each touch-driven member.

[0009] To achieve the above object, the present invention provides a display unit with a touch panel which is capable of detecting a pushing force applied to a touch-driven member displayed on a display surface of the display panel in two stages, wherein the touch-driven member is made movable on the display screen in response to a first pushing condition, and a function associated with the touch-driven member is made executable in response to a second pushing condition.

[0010] Specifically, a representative means according to the present invention includes sensing means for sensing a pushing force  $P$  produced by indicating means when the indicating means touches the touch-driven member, and a control unit for performing first processing associated with the touch-driven member pushed by the indicating means when the pushing force  $P$  detected by the sensing means is equal to or larger than a first set pressure  $P1$  and smaller than a second set pressure  $P2$  larger than the first set pressure  $P1$  ( $P1 \leq P < P2$ ), and for performing second processing associated with the touch-driven member pushed by the indicating means when the pushing force  $P$  is equal to or larger than the second set pressure  $P2$  ( $P2 \leq P$ ), wherein the first processing includes dragging the touch-driven member following the indicating means pursuant to a movement of the indicating means, and the second processing includes activating a function previously assigned to the touch-driven member.

[0011] Other objects, features and advantages of the invention will become apparent from the following description of the embodiments of the invention taken in conjunction with the accompanying drawings.