ROTARY TYPE HINGE MODULE FOR PORTABLE WIRELESS TERMINAL

PRIORITY

[0001] The application claims priority to Korean Patent Application Serial No.: 51282/2001, filed Aug. 24, 2001, 31342/2002, filed Jun. 4, 2002 and 41354/2002, filed Jul. 15, 2002, the contents of each of which are hereby incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a hinge module of a portable wireless terminal, and more particularly to a rotary type hinge module, which enables a flip or folder to be rotated while the rotary type hinge module itself can rotate with respect to a terminal body.

[0004] 2. Description of the Prior Art

[0005] As generally known in the art, portable wireless terminals may be classified into those of bar type, flip type, and folder type, according to the shapes of the terminals.

[0006] In the bar-type terminal, which employs data input/output means and transmission/receiving module installed in a housing of one terminal body, a keypad through which data is inputted and which is always exposed may be misoperated, and there is a limitation in reducing the dimension of the terminal since a predetermined distance must be secured between a transmission section and a receiving section.

[0007] The flip-type terminal includes a terminal body, a flip, and a hinge system connecting the terminal body and the flip with each other. In the flip-type terminal, data input/output means and transmission/receiving module are installed in a housing of the terminal body, and the flip covers a keypad which is the data input means, thereby preventing the keypad from being misoperated. However, there is also a limitation in reducing the dimension of the flip-type terminal due to the problem of a predetermined distance to be secured between a transmission section and a receiving section.

[0008] The folder-type terminal includes a terminal body, a folder, and a hinge system connecting the terminal body and the folder with each other, and is opened or closed by rotating the folder. When the terminal is in a communication-waiting mode, the folder is in tight contact with the terminal body, so that the keypad can be prevented from being misoperated. When the terminal is in a communication mode, the folder is unfolded, so that a sufficient distance can be secured between a transmission section and a receiving section, which makes the folder-type terminal be advantageous in reducing the dimension of the terminal. Due to this reason, it is a current trend that the folder-type terminal is gradually becoming a main type of portable wireless terminal.

[0009] In the flip-type terminal or the folder-type terminal described above, the flip or folder and the terminal body are rotatably assembled with each other by the hinge system. The hinge system generates a force. The force is applied to the flip or folder in a direction which enables the flip or folder to be opened when the flip or folder has been rotated further than a predetermined angle, or in a direction which forces the flip or folder to be in tight contact with the terminal body when the flip or folder has been rotated less than a predetermined angle.

[0010] U.S. Pat. No. 6,292,980, issued to the present applicant on Sep. 25, 2001, discloses one of the conventional hinge systems as described above. In the disclosed hinge system, a hinge cam having a mountain-shaped portion, a hinge shaft having a valley-shaped portion, and a spring forcing the hinge cam and the hinge shaft to be in tight contact with each other are received in a hinge housing. The folder or flip can be opened or closed by exerting an opening force that overcomes the elastic force of the spring and curved surfaces of the mountain-shaped portion and the valley-shaped portion.

[0011] As the mobile communication service gradually becomes more and more diversified, the functions of the terminals also become rapidly diversified. However, the conventional hinge systems have a function of simply opening or closing the flip or folder from a terminal body. As a result, this limits changing the configuration of the terminal, for example, in adding additional devices to the terminal in order to realize various mobile communication service required by customers. Moreover, the conventional hinge systems not only have restrictions in changing particulars or design of the terminal, but also cannot meet the preferences of customers nor follow the current trend of providing various mobile communication services.

SUMMARY OF THE INVENTION

[0012] Accordingly, the present invention has been made to solve the above-mentioned problems occurring in the prior art, and an object of the present invention is to provide a hinge system, which is advantageous in changing the configuration of a portable wireless terminal.

[0013] It is another object of the present invention to provide a hinge system, which enables front and rear surfaces of a folder of a portable wireless terminal to be turned over.

[0014] In order to accomplish this object, there is provided a rotary-type hinge module of a portable wireless terminal, which is disposed between a terminal body and a folder of the portable wireless terminal. The hinge module has a first rotation axis and a second rotation axis perpendicular to each other. The hinge module enables the folder to rotate about the second rotation axis after the folder is opened from the terminal body.

[0015] The hinge module comprises and is described as follows: A hinge housing is assembled with the terminal body while being rotatable about the first rotation axis. The hinge housing has a holing pin hole formed through one end thereof and a hinge shaft hole formed through the other end thereof in a direction of the first rotation axis. The hinge housing has a fixing seat and an opening, the fixing seat being formed at a portion of an inner surface thereof in a direction of the second rotation axis, and the opening being formed through an opposed portion to the fixing seat. The fixing seat is exposed through the opening in the direction of the second rotation axis. A supporting shaft is fixed to the fixing seat of the hinge housing and extends through the opening of the hinge housing. A hinge cam is fixed to the supporting shaft and has a valley-shaped portion formed at