

ELECTROSTATIC-CAPACITANCE-TYPE COORDINATE INPUT DEVICE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to an electrostatic-capacitance-type coordinate input device used as a pointing device for a personal computer and, more particularly, to a thin input device.

[0003] 2. Description of the Related Art

[0004] FIG. 11 is a sectional view showing a conventional input device in a simplified manner. This input device 100 is of a pad type, which is one type of pointing device incorporated in a notebook personal computer.

[0005] In this input device 100 shown in FIG. 11, an X electrode layer 103 formed of a plurality of X electrodes 102 is multilayered on the top surface of a film substrate 101 made of a synthetic resin, and a Y electrode layer 105 formed of a plurality of Y electrodes 104 is multilayered on the underside of the film substrate 101. The X electrode 102 and the Y electrode 104 are arranged in a lattice form.

[0006] The surfaces of the X electrode layer 103 and the Y electrode layer 105 are coated with insulating films 106 and 107, respectively. Next, a surface sheet 108 is disposed on the X electrode layer 103 side, which is the operation surface side. All the outer dimensions of the electrode layers 103 and 105, the insulating films 106 and 107, and the surface sheet 108 are formed as the same rectangle.

[0007] Furthermore, a control circuit substrate 110 is disposed in the bottommost layer on a side opposite to the surface sheet 108, and a control circuit 111 is disposed on a surface opposite to the film substrate 101. The control circuit substrate 110 is also formed with outer dimensions which are the same as those of the film substrate 101.

[0008] Furthermore, in the input device 100, through holes (not shown) are formed in the film substrate 101, the insulating film 107, and the control circuit substrate 110. The X electrode layer 103 and the Y electrode layer 105 are made to electrically conduct with each other, so that a signal based on the electrostatic capacitance detected by the X electrode layer 103 and the Y electrode layer 105 is sent to the control circuit 111.

[0009] However, in the above-described conventional input device 100, since all the electrode layers 103 and 105 including the film substrate 101 are provided on the control circuit substrate 110, the thickness dimensions of the entire input device become large, and when the input device 100 is incorporated in a notebook personal computer (PC), the thickness dimensions of the PC cannot be made thinner. Furthermore, since the control circuit substrate 110 becomes the same size (area) as that of the film substrate 101, costs are increased.

[0010] In order to mount the input device 100 on a PC housing, etc., a support plate made of metal is mounted on the input device 100, and the support plate is screwed in to the PC housing. Furthermore, a rectangular opening for the input device 100 is formed in the PC housing, for example, in front of the keyboard, so that the input device is exposed from the surface of the PC housing, and the input device is provided in the opening.

[0011] When installing in the PC housing, a support plate and an opening are necessary, costs are increased, and the flexibility of design of the PC housing is decreased due to the formation of the opening.

SUMMARY OF THE INVENTION

[0012] The present invention aims to overcome such problems of the conventional art. An object of the present invention is to provide an input device which can be formed thin so as to improve the flexibility of design of the PC housing.

[0013] In order to achieve the above object, the present invention provides an electrostatic-capacitance-type coordinate input device comprising an input sensor formed in such a manner that an X electrode layer and a Y electrode layer for detecting electrostatic capacitance are multilayered on a flexible substrate, wherein the input sensor is bonded on the rear surface of an insulating support plate for supporting the input sensor. As a result of employing such a configuration, it is possible to operate the thin input sensor bonded on the rear surface of the support plate from the top surface of the support plate.

[0014] A recess to which the input sensor is fitted may be formed on the rear surface of the support plate at a position where the input sensor is bonded. As a result of employing such a configuration, the input sensor can be housed almost completely within the plate thickness of the support plate, and operation can be performed more satisfactorily from the top surface of the support plate whose thickness is made thin.

[0015] A pointing section for pointing the position of the input sensor may be formed in the support plate. As a result of employing such a configuration, it is possible for an operator to easily know the position of the input sensor supported on the rear surface of the support plate.

[0016] As described in the foregoing, according to the present invention, the input device can be formed thin.

[0017] More specifically, since the input sensor is bonded on the rear surface of the insulating support plate which supports the input sensor, the input sensor can be formed thin, a device in which the input device is incorporated can be formed very thin, and the input sensor can also be incorporated so as to be arranged along a curve.

[0018] If a recess to which the input sensor is fitted is formed on the rear surface of the support plate at a position where the input sensor is bonded, the input sensor can be housed almost completely within the plate thickness of the support plate, and operation can be performed more satisfactorily from the top surface of the support plate whose thickness is made thin.

[0019] If a pointing section for pointing the position of the input sensor is formed in the support plate, it is possible for an operator to easily know the position of the input sensor supported on the rear surface of the support plate.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] FIG. 1 is a plan view showing an embodiment of an input device according to the present invention;

[0021] FIG. 2 is a right side view of a personal computer of FIG. 1;