

attached about its entire periphery to each of the frame members and further comprise means for mounting that frame in association with the touch screen. This mounting means may comprise a hinge. Instead, the mounting means may comprise a tongue associated with the frame and slidably disposed within a groove disposed adjacent the touch screen on the housing.

[0015] As an alternative to a frame, the mounting means may comprise a series of holes located adjacent the left and right edges of the membrane, left and right sprockets that engage the holes and means for rotating the sprockets, which may be actuated or manually or by a reversible motor. In this embodiment, the membrane edges may be re-enforced to minimize wear or damage to the membrane during the driving of same by the rotating sprockets.

[0016] In still another embodiment, the membrane can be removably maintained in a predetermined position with a band of adhesive disposed adjacent to the periphery of the membrane, such that the membrane is affixed to either the rigid contact surface or more preferably the housing about the periphery of the rigid contact surface. Alternatively, the membrane can be removably maintained with one or more fasteners disposed about the peripheries of the rigid contact surface and the membrane. These fasteners may comprise a mated pair of hook and loop fasteners, a mated pair of snaps or any other type-of-mechanical fasteners. Conceivably the membrane itself may be formed of a material, which, due to its inherent properties, is attracted to the surface of the touch screen, e.g. static charge, or the like.

[0017] In yet another embodiment, the means for removably maintaining the membrane in a predetermined position may comprise a membrane storage chamber disposed within the housing. The chamber is provided with an opening parallel and proximate to one of the edges of the touch screen surface. In this embodiment, a pair of opposing slots positioned parallel to each other and perpendicular to the chamber opening extends from the opening to a location proximate an opposite edge of the contact surface such that the membrane can be slidably restrained within the pair of slots using various means. In this embodiment, the membrane may be biased to retract into the membrane storage chamber, thus, requiring means for fastening the membrane in its touch screen registration position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] In the drawings, which depict presently preferred embodiments of the invention and in which like reference numerals refer to like parts in different views:

[0019] FIG. 1 of the drawings is an exploded perspective view of one embodiment of the present invention shown being used in association with a cellular or cordless telephone;

[0020] FIG. 2 of the drawings is a front cross-sectional, elevational view of one embodiment of the present invention in which a flexible membrane is disposed in registration with a rigid contact surface;

[0021] FIG. 2a of the drawings is a front cross-sectional, elevational view of another embodiment of the present invention in which a flexible membrane—having a plurality of raised dome-shaped regions integrally formed therein—is disposed in registration with a rigid contact surface;

[0022] FIG. 2b of the drawings is a front cross-sectional, elevational view of another embodiment of the present invention in which a flexible membrane—having a plurality of raised dome-shaped regions formed by adding additional material to the membrane—is disposed in registration with a rigid contact surface;

[0023] FIG. 2c of the drawings is a front cross-sectional, elevational view of a raised dome bearing flexible membrane embodiment wherein one of the domes is being manually pressed;

[0024] FIGS. 3a through 3d of the drawings are each partial perspective views of various stages of deployment of the flexible membrane in registration with a rigid contact surface in another embodiment of the present invention;

[0025] FIG. 4 is a side elevational, cross-sectional view taken along line 4-4 of FIG. 3a showing, in particular, the membrane storage chamber, right sprocket and spring-biasing member;

[0026] FIG. 5 of the drawings is a schematic representation of one embodiment of the drive mechanism for deploying and retracting the flexible membrane;

[0027] FIG. 6 of the drawings is a schematic representation of another embodiment of the drive mechanism for deploying and retracting the flexible membrane;

[0028] FIG. 7 of the drawings is an exploded top plan view of another embodiment of the present invention in which the flexible membrane is removably maintained in association with the rigid contact surface using adhesive;

[0029] FIG. 8 of the drawings is an exploded top plan view of an embodiment of the present invention in which the flexible membrane is removably maintained in association with the rigid contact surface using a mated pair of hook and loop fasteners;

[0030] FIG. 9 of the drawings is an exploded top plan view of an embodiment of the present invention in which the flexible membrane is removably maintained in association with the rigid contact surface using mated pairs of snaps; and

[0031] FIG. 10 of the drawings is an exploded top plan view of an embodiment of the present invention in which the flexible membrane is removably maintained in association with the rigid contact surface using a frame having a tongue engaged in a groove on the housing.

BEST MODES FOR CARRYING OUT THE INVENTION

[0032] While this invention is susceptible of embodiment in many different forms, there is shown in the drawings, and will herein be described in detail, a number of embodiments, with the understanding that the present disclosure can be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiments illustrated.

[0033] FIG. 1 of the drawings shows a cellular or cordless telephone handset 10 having a microphone 11, an earpiece 12, momentary contact switches 13, 14 and 15, and a touch screen 20 all being maintained within housing 16. Of course, it will be understood that while a cellular or cordless telephone has been shown in the drawings and will be used in describing the present invention, the invention has appli-