

[0014] FIG. 7 is an assembled bottom perspective view of an electronic subassembly having a mounting apparatus for mounting a display screen to a printed circuit board, according to one preferred embodiment; and

[0015] FIG. 8 is an exploded top perspective view of the electronic subassembly shown in FIG. 1 mounted within a glucose meter, according to one preferred embodiment.

[0016] It will be appreciated that for simplicity and clarity of illustration, elements shown in the figures have not necessarily been drawn to scale. For example, dimensions of some elements are exaggerated relative to each other. Further, where considered appropriate, reference numerals have been repeated among the figures to indicate corresponding elements.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

[0017] In view of the above limitations of existing mounting apparatus, it is an aspect of the present invention to provide an apparatus for more easily and more precisely mounting a display screen to a printed circuit board. Shown in FIG. 1 is an exploded perspective view of an electronic sub-assembly 20 having a printed circuit board 32, a display screen 28, and a mounting apparatus 26 for mounting the display screen 28 to the printed circuit board 32. The printed circuit board 32 may be any printed circuit board known to those skilled in the art which may be used for mounting electronic components 22. Preferably, the printed circuit board 32 is manufactured from materials such as: epoxy glass, FR4, and polyamide. The printed circuit board 32 has a number of electronic components 22 mounted on the surface of printed circuit board 32. These electronic components 22 are electrically connected to each other through a number of lands (not shown) and traces (not shown) printed on the surface and the internal layers of the printed circuit board 32. The electronic components 22 can include any electronic component known to those skilled in the art, such as, for example, a battery, a capacitor, a resistor, a semiconductor chip, a diode, an inductor, and a coil. Preferably, the printed circuit board 32 forms first and second mating holes 50 for receiving first and second snap-fit members 40, as described below.

[0018] The display screen 28 has contacts 29 and four edges 30, as illustrated in FIGS. 1 and 6. The display screen 28 is any device which may be used to view non-static, or changing, information known to those skilled in the art, such as, for example, a liquid crystal display, a plasma screen, or a cathode ray tube. The contacts 29, through elastomeric connectors 58, electrically connect the display screen 28 to the printed circuit board 32, as described below. The display screen 28 includes a top side 62 opposed to a bottom side 64, as illustrated in FIGS. 1-2. The contacts 29 are disposed along at least one edge 30 of the bottom side 64, as illustrated in FIG. 1. In one embodiment, the contacts are disposed along two edges 30 of the bottom side 64.

[0019] The mounting apparatus 26 mounts the display screen 28 to the printed circuit board 32, as illustrated in FIGS. 1-3. The mounting apparatus 26 includes a top member 34 opposed to a bottom member 36, a first snap fit member 40, and a second snap fit member 40. The mounting apparatus 26 is made of any material that is rigid enough to form elements such as the top member 34 and the bottom

member 36. In one preferred embodiment, the mounting apparatus 26 is made of rigid materials, such as, for example, metals such as steel, aluminum, and brass, and plastics such as, Ethylene-vinyl acetate, Acrylics such as Acrylonitrile-butadiene-styrene and Acrylic-styrene-acrylonitrile, and Polymers such as Polycarbonate, Polyurethane, Polyethylene, Polybutylene, Polyvinyl chloride, Polyphenylene oxide, Chlorinated polyvinyl chloride, Polyamides, and Polybutylene terephthalate. Mounting apparatus 26 may be formed using any technique known to one of ordinary skill, such as die casting, injection molding, or brazing. The top member 34 and the bottom member 36 each form an overhang 38, wherein each overhang 38 is adapted to receive one edge 30 of the display screen 28. Preferably each overhang 38 is disposed so as to come into contact, or at least face, the top side 62 of the display screen 28, as illustrated in FIG. 2. The overhangs 38 prevent the display screen 28 from moving in a direction away from the surface of the printed circuit board 32. More specifically, the overhangs 38 prevent the display screen 28 from moving in a direction along the Z-axis, as illustrated in FIG. 1.

[0020] As shown in FIG. 6, the top member 34 forms a top sidewall 42, wherein the top sidewall 42 abuts against a first edge 30 of the display screen 28 when the display screen 28 is received by the mounting apparatus 26. Additionally, the bottom member 36 forms a bottom sidewall 44, wherein the bottom sidewall 44 abuts against a second edge 30 of the display screen 28 when the display screen 28 is received by the mounting apparatus 26. The top sidewall 42, in conjunction with the bottom sidewall 44, prevents the display screen 28 from moving in a direction along the surface of the printed circuit board 32. More specifically, the top sidewall 42, in conjunction with the bottom sidewall 44, prevents the display screen 28 from moving in a direction along the Y-axis, as illustrated in FIG. 1.

[0021] In one preferred embodiment, the top member 34 and the bottom member 36 each have a connector slot 56, wherein each connector slot 56 is adapted to receive an elastomeric connector 58, as shown in FIG. 1. The elastomeric connectors 58 electrically connect the display screen 28, and more specifically the contacts 29, to the printed circuit board 32. The elastomeric connectors 58 generally comprise alternating layers of flexible conductive and insulating materials so as to create a somewhat flexible electrical connector. In one preferred embodiment, the connector slots 56 contain a plurality of slot bumps 60 that engage the sides of the elastomeric connectors 58 to prevent the elastomeric connectors 58 from falling out of the connector slots 56 during assembly, as illustrated in FIG. 1.

[0022] In one preferred embodiment, the mounting apparatus 26 includes a connecting member 46 connected with the top member 34 and the bottom member 36. Preferably, the mounting apparatus 26 includes two connecting members 46 connected with the top member 34 and the bottom member 36, as illustrated in FIG. 1. More preferably, one connecting member 46 connects a first end of the top member 34 to a first end of the bottom member 36, and another connecting member 46 connects a second end of the top member 34 to a second end of the bottom member 36, as illustrated in FIGS. 1 and 2. The connecting member 46 joins the top member 34 to the bottom member 36, so that the distance between the top member 34 and the bottom member 36 remains relatively constant. Preferably, connect-