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(54) **Push-button keypads.**

(57) A keypad of the kind utilising a profiled one-piece silicone-rubber mat, in which the rigid back plate is coated with electroluminescent material whereby the keys may be back-lit.

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Description

Push-button keypads

The present invention relates to push-button keypads.

In particular, although not exclusively, the invention relates to push-button keypads in which the keys are formed as respective sections of a profiled mat of a resilient electrically insulating material, such as silicone rubber, behind which are provided respective sets of electrical conductors which are to be interconnected by operation of the respective keys.

According to one aspect of the present invention in a push-button keypad in which operation of keys of said keypad is arranged selectively to interconnect respective ones a pattern of electrical contacts provided on an electrically insulating member interposed between said keys and a substantially rigid support plate, said support plate is provided with a coating of electroluminescent material whereby said keys may be backlit.

According to another aspect of the present invention a push-button keypad comprises a profiled membrane of resilient electrically insulating material formed to provide at least one area arranged to act as a push-button key, the or each said area bearing on its rear face one or more electrically conductive moving contacts, a substantially rigid support plate, and an electrically insulating member interposed between said membrane and said support plate which member carries a pattern of electrical conductors forming substantially fixed contacts in respect of the or each push-button key, said support plate being provided with a coating of electroluminescent material on its surface adjacent said insulating member whereby the or each said push-button key may be backlit.

The electrically insulating member may comprise a polyester film.

A push-button keypad in accordance with the present invention will now be described by way of example with reference to the accompanying drawing, which shows the component parts of the keypad schematically in cross-section.

Referring to the drawing the keypad comprises three separable component parts, a profiled silicone rubber mat 1, a polyester film 2 bearing a conductor pattern (not shown), and a substantially rigid support plate 3. In an assembled keypad the down-turned edges 4 of the mat 1 are arranged to fit closely around the edge of the support plate 3 to form effectively a sealed unit.

The profiled mat 1 includes a plurality of raised areas or keys 5, only one of which is shown, having a generally rectangular central region 6 within which a transparent or partly transparent snap-in legend slip (not shown) may be positioned. The side walls 7 of each raised area 5 may be of thinner section than the surrounding areas to allow for the required downward movement of the central region 6 in response to a minimum operating pressure.

Each central region 6 carries on its undersurface a moving contact 8, for example in the form of a short length of rectangular section tube of electrically conductive material, while the film 2 bears on its upper surface a pattern of conductors (not shown) which provide respective fixed contacts for each key 5, together with the necessary external connections via flexible strip 9 to a multiway socket connector 10. The conductors may be formed of a conductive polymer.

The support plate 3, which may be a metal plate, is provided with a slot 11 through which the flexible strip 9 passes and which may be sealed (not shown) against the ingress of moisture or corrosive atmospheres. The plate 3 may also be provided with studs 12 by which the keypad may be mounted in use.

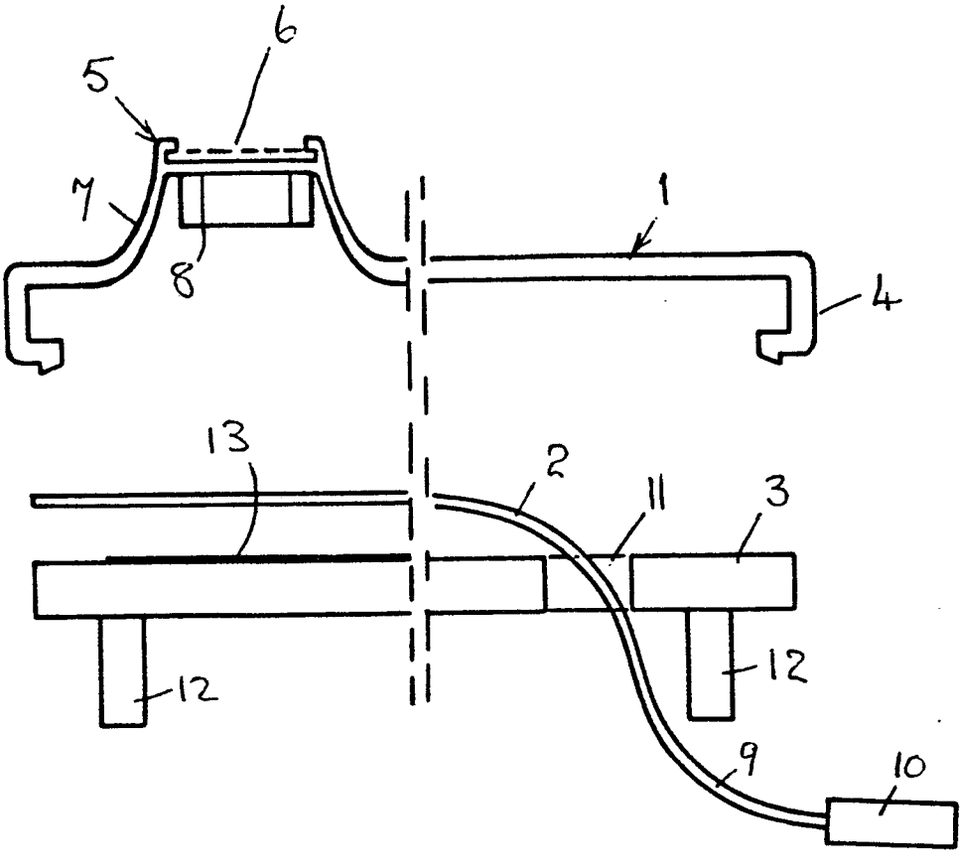
In order to provide back lighting for each key 5 and its legend the upper surface of the support plate 3 is coated with a layer of an electroluminescent material 13, the light produced when this layer is energised passing through the translucent mat 1. The provision of the layer 13 does not affect the mechanical layout or the outline of the keypad or the tactile or sealed nature of the unit.

Claims

1. A push-button keypad in which operation of keys of said keypad is arranged selectively to interconnect respective ones a pattern of electrical contacts provided on an electrically insulating member interposed between said keys and a substantially rigid support plate, wherein said support plate is provided with a coating of electroluminescent material whereby said keys may be backlit.

2. A push-button keypad comprising a profiled membrane of resilient electrically insulating material formed to provide at least one area arranged to act as a push-button key, the or each said area bearing on its rear face one or more electrically conductive moving contacts, a substantially rigid support plate, and an electrically insulating member interposed between said membrane and said support plate which member carries a pattern of electrical conductors forming substantially fixed contacts in respect of the or each push-button key, said support plate being provided with a coating of electroluminescent material on its surface adjacent said insulating member whereby the or each said push-button key may be backlit.

3. A push-button keypad in accordance with Claim 1 or Claim 2 wherein the electrically insulating member comprises a polyester film.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