

SPECIFICATION

Device for mounting at least one appliance on a flat surface

5 The invention relates to a device for mounting at least one single or multi-pole circuit breaker on a flat surface.

Electrical wiring appliances, and in particular circuit breakers, are normally incorporated in distribution boxes, on the inner floor surface of which are fitted support rails onto which the wiring appliances and in particular the circuit breakers are snap-mounted.

10 The casings comprise a front cover plate with a slot or aperture through which the wiring appliances extend in such a manner that the connection terminals of the wiring appliances are covered.

In such positions, in which only a single and possibly single-pole circuit breaker can be fixed, an adapter or a base is normally fixed to the wall, on which means for fixing the circuit breaker are provided so that the circuit breaker can be fixed directly onto the wall. In addition, cover caps must be provided for this purpose. Such fixing methods are mainly used where electrification has not yet reached an advanced point, or in buildings with only one electric circuit. In order also to be able to connect the neutral wire or return wire, a terminal is fixed close to the circuit breaker on the support rail or on the lower part, to which the return line from the user item and the line to the mains are connected.

20 The object of the invention is to provide a device which is simplified relative to known devices.

35 According to the present invention, there is provided a device for mounting at least one wiring appliance provided with connection terminals, such as a single pole or a multiple pole circuit breaker, on a flat surface, comprising a base of plastics material having means for retaining the at least one wiring appliance, a casing element for receiving a terminal member, provided on the base beside the means for fixing the said at least one wiring appliance, and a cover capable of being secured to the base to cover at least partly the connection terminals of the wiring appliance and the terminal member and apertured to provide access to the appliance.

40 Preferably, the means for retaining said at least one appliance comprise projections which together form a support rail for the snap-mounting of the wiring appliance.

45 As most circuit breakers are snap-mounted onto so-called hat profile support rails, the means or projections together form a hat profile rail. A known circuit breaker can be snap-mounted in normal manner onto this hat profile rail.

50 According to a further embodiment of the invention, the casing element comprises a passage extending parallel to the longitudinal side of the base, and through apertures surrounded by projections are formed in the free front surface of the casing element which extends parallel to the

65 base surface of the lower part, and which are used for the passage of terminal screws of the terminal and for the passage of a screwdriver for screwing the terminal screws. A terminal used for the through-connection of a neutral lead can easily be inserted into this casing element.

70 Advantageously, the base is approximately of shallow box form, with lips being provided on the front edges of the opposing side walls for guiding the cover onto the base. The cover is fixed onto the base by screws which are screwed into blind holes in the base. In order to be able to insert cables into the interior of the compartment defined by the cover and base, embossments are provided which enclose wall portions which can be broken out by virtue of the embossments to form openings through which cables can be inserted.

80 With the base of the invention, the wiring appliance and in particular the circuit breaker is more quickly and easily mounted. Furthermore, the cover is easily fixed to the base. If a contact breaker with a snap-type mounting is used, as is generally the case, then the lower part will possess the hat profile rail with, directly adjacent thereto on the base, the terminal support or casing element in which the terminal member is located. By this means, single or multi-pole automatic circuit breakers or wiring appliances with or without terminals can be fixed onto the base. It is also possible that the terminals may not need to be used.

One embodiment of the invention is described in greater detail with reference to the drawings, in which:

100 Figure 1 is a perspective view of a base according to the invention;

Figure 2 is a perspective view of a cover;

Figure 3 is a section on the line III—III of Figure 1; and

105 Figure 4 is a section on the line IV—IV of Figure 1.

110 The arrangement according to the invention is composed of a base 10 and a cover 12. The base 10 is of longitudinally extending rectangular shape and is in the form of a shallow box with a floor portion 14 and side walls 16, 18, 20 and 22 surrounding the floor portion and projecting perpendicular therefrom. The upwardly facing free front edges, which are indicated by the reference numeral 24 for all side walls from 16 to 22, comprise a surrounding recess 26 or ledge 26, the distance of which from the outer surface of the side walls is relatively small in comparison with the side wall thickness. That region of the front edges 24 between the recess 26 and inner surface is provided with lips, with the lips 28 in the region of the side walls 16 and 18 extending from the side wall middle to cover about two thirds of the front edges 24 of the side walls 16 and 18, whereas the lips 30 on the front edges of the side walls or narrow side walls 20 and 22 are disposed only in the region of one corner and lie diametrically opposite each other. The length of the lips 30 is about one sixth to one fifth of the

length of the narrow side walls 20 and 22. At the neighbouring corners, i.e. at those corners at which the lips 30 are not present, i.e. at those corners at which the side walls 16 and 20 and the side walls 18 and 22 come together, bosses 32 and 34 are provided on the inside, projecting towards the interior of the lower part, and comprise blind bores 36 and 38, the purpose of which will be described hereinafter.

Figure 3 shows the internal arrangement of the base 10 in greater detail. One of the halves of the floor portion 14 comprises a recess 40 and bars 42 and 44 extending transversely to the recess 40. These bars comprise portions 46 and 48 extending perpendicular to the floor portion 14 or to the lower outer surface of the floor portion 14, a second portion 50 and 52 extending at an angle of about 30 to 45° to the portion 46 and 48, and a third portion 54 and 56 connected thereto. The two portions 50 and 52 are so formed that they together form a V, and the portions 54 and 56 face away from each other and extend perpendicular to the portions 46 and 48, i.e. parallel to the floor portion 14. The two bars 42 and 44 together form a hat profile rail arrangement on which a circuit breaker 60, shown by a dashed line, is snap-mounted. The recess 40 is not in itself necessary. It only provides constructional advantages. In this respect, when the base is injection moulded, a tool cannot engage between the inner surface of the floor portion and the outwardly facing end portions 56 and 54 of the two projections 44 and 42, so that a so-called "side slider" must be provided on the injection moulding tool. The form of the slider determines the form of the opposing edges of the recess 40. These edges are constructed step-wise with a portion 64 and 62 extending approximately parallel to the portion 52 and 50 respectively.

It can be seen both in Figure 2 and Figure 3 that adjacent to the position in which the contact breaker 60 is snapped-on, a support 66 is formed on the floor, on which a casing element 68 is fitted, this latter in this particular case being moulded-on. The casing element 68 is approximately of box-form and comprises a passage 70 which extends parallel to the side walls and to the floor portion, and is provided with two upwardly directed holes, not shown, these holes being surrounded by cylinder-shaped projections 72 and 74. These cylinder-shaped projections each comprise an inner bore 76 which extend inwards into the passage 70 through the holes, not shown. The outer surfaces of the two projections 72 and 74 extend upwards in the form of cone frustums. A terminal bush 78 is inserted into the casing element 68, and only a part thereof can be seen. Access is obtained to terminal screws in the terminal bush 78 through the bores or openings 76. The terminal bush 78 is used for the through-connection or two-sided connection of a conductor.

A cover 12 is mounted on the base, and is of approximately shallow box-shape adapted to the external shape of the contact breaker 60. The

upper surface of the cover 12, indicated by the reference numeral 80, comprises a window 82 which extends over only half the upper surface 80, whereas the other half remains covered by a cover wall 84 which can be broken out at the thinned edges 86. In the region of the diametrically opposing corners of the cover which correspond to the corners comprising the bosses 32 and 34, there is an angular vertically extending recess 88 and 90, which is bounded at its bottom, i.e. towards that end which faces the base 10, by a flange-shaped projection 92 and 94, these projections being aligned with the edges of the narrow sides and the edges of the long sides to make up the base surface of the cover into a rectangle corresponding to the base 10. Bores, not shown, corresponding with the blind bores 36 and 38 are provided in the projections 92 and 94, through which screws 96 and 98 are inserted for screwing into the blind bores 36 and 38 when the cover 12 is mounted on the base 10. In the region of the screws of blind bores 36 and 38, and 96 and 98, and parallel thereto, there are perforations 100 and 102 in the base and 104 and 106 in the cover, which when in the assembled state are aligned with each other and through which for example a sealing wire can be inserted.

Semicircular embossments 108 and 110 are provided on the narrow side walls 20 and 22, and together with embossments 112 on the cover 12 (of which only the front one can be seen) can be broken out to form a circular hole, through which cables can be led into the interior of the covered base. There are also embossments 114 and 116 in the floor portion 14 in the vicinity of the narrow side walls 20 and 22, to enable cables to be led to the contact breaker 60 from underneath.

In Figure 4, the shape of the line of separation between the cover 12 and base 10 can be seen. This shows the recess 26 and lip 28, which has a trapezium cross-section, and a stepped formation can be seen on the cover 12, i.e. on the edge which faces the base 10, and comprising a step 27 corresponding to the cavity 26 and a step 29 corresponding to the lip 28. The purpose of the steps 26 and 27 is for holding and guiding the side walls of the cover 12 onto the base, while the lips 28 are only for centering purposes (as are the lips 30).

In the floor portion there are fixing holes 120 in the region of the corners. Only that hole can be seen which is situated in the region of the boss 32. Screws can be inserted through the holes 120 and screwed into wall plugs in the wall (not shown), so making the base fixable to a wall.

CLAIMS

1. A device for mounting at least one wiring appliance provided with connection terminals, such as a single pole or a multiple pole circuit breaker, on a flat surface, comprising a base of plastics material having means for retaining the at least one wiring appliance, a casing element for receiving a terminal member, provided on the base beside the means for fixing the said at least one



length of the narrow side walls 20 and 22. At the neighbouring corners, i.e. at those corners at which the lips 30 are not present, i.e. at those corners at which the side walls 16 and 20 and the side walls 18 and 22 come together, bosses 32 and 34 are provided on the inside, projecting towards the interior of the lower part, and comprise blind bores 36 and 38, the purpose of which will be described hereinafter.

- 10 Figure 3 shows the internal arrangement of the base 10 in greater detail. One of the halves of the floor portion 14 comprises a recess 40 and bars 42 and 44 extending transversely to the recess 40. These bars comprise portions 46 and 48
- 15 extending perpendicular to the floor portion 14 or to the lower outer surface of the floor portion 14, a second portion 50 and 52 extending at an angle of about 30 to 45° to the portion 46 and 48, and a third portion 54 and 56 connected thereto. The two portions 50 and 52 are so formed that they together form a V, and the portions 54 and 56 face away from each other and extend perpendicular to the portions 46 and 48, i.e. parallel to the floor portion 14. The two bars 42 and 44 together form a hat profile rail arrangement on which a circuit breaker 60, shown by a dashed line, is snap-mounted. The recess 40 is not in itself necessary. It only provides constructional advantages. In this respect, when the base is injection moulded, a tool cannot engage between the inner surface of the floor portion and the outwardly facing end portions 56 and 54 of the two projections 44 and 42, so that a so-called "side slider" must be provided on the injection moulding tool. The form of the slider determines the form of the opposing edges of the recess 40. These edges are constructed step-wise with a portion 64 and 62 extending approximately parallel to the portion 52 and 50 respectively.
- 40 It can be seen both in Figure 2 and Figure 3 that adjacent to the position in which the contact breaker 60 is snapped-on, a support 66 is formed on the floor, on which a casing element 68 is fitted, this latter in this particular case being moulded-on. The casing element 68 is approximately of box-form and comprises a passage 70 which extends parallel to the side walls and to the floor portion, and is provided with two upwardly directed holes, not shown, these holes being surrounded by cylinder-shaped projections 72 and 74. These cylinder-shaped projections each comprise an inner bore 76 which extend inwards into the passage 70 through the holes, not shown. The outer surfaces of the two projections 72 and 74 extend upwards in the form of cone frustums. A terminal bush 78 is inserted into the casing element 68, and only a part thereof can be seen. Access is obtained to terminal screws in the terminal bush 78 through the bores or openings 76. The terminal bush 78 is used for the through-connection or two-sided connection of a conductor.

A cover 12 is mounted on the base, and is of approximately shallow box-shape adapted to the external shape of the contact breaker 60. The

- upper surface of the cover 12, indicated by the reference numeral 80, comprises a window 82 which extends over only half the upper surface 80, whereas the other half remains covered by a cover wall 84 which can be broken out at the thinned edges 86. In the region of the diametrically opposing corners of the cover which correspond to the corners comprising the bosses 32 and 34, there is an angular vertically extending recess 88 and 90, which is bounded at its bottom, i.e. towards that end which faces the base 10, by a flange-shaped projection 92 and 94, these projections being aligned with the edges of the narrow sides and the edges of the long sides to make up the base surface of the cover into a rectangle corresponding to the base 10. Bores, not shown, corresponding with the blind bores 36 and 38 are provided in the projections 92 and 94, through which screws 96 and 98 are inserted for screwing into the blind bores 36 and 38 when the cover 12 is mounted on the base 10. In the region of the screws of blind bores 36 and 38, and 96 and 98, and parallel thereto, there are perforations 100 and 102 in the base and 104 and 106 in the cover, which when in the assembled state are aligned with each other and through which for example a sealing wire can be inserted.

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- In Figure 4, the shape of the line of separation between the cover 12 and base 10 can be seen. This shows the recess 26 and lip 28, which has a trapezium cross-section, and a stepped formation can be seen on the cover 12, i.e. on the edge which faces the base 10, and comprising a step 27 corresponding to the cavity 26 and a step 29 corresponding to the lip 28. The purpose of the steps 26 and 27 is for holding and guiding the side walls of the cover 12 onto the base, while the lips 28 are only for centering purposes (as are the lips 30).

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CLAIMS

1. A device for mounting at least one wiring appliance provided with connection terminals, such as a single pole or a multiple pole circuit breaker, on a flat surface, comprising a base of plastics material having means for retaining the at least one wiring appliance, a casing element for receiving a terminal member, provided on the base beside the means for fixing the said at least one



- wiring appliance, and a cover capable of being secured to the base to cover at least partly the connection terminals of the wiring appliance and the terminal member and apertured to provide
- 5 access to the appliance.
2. A device as claimed in claim 1, in which the means for retaining said at least one appliance comprise projections which together form a support rail for the snap-mounting of the wiring
- 10 appliance.
3. A device as claimed in claim 2, in which the means for retaining define two parallel oppositely facing edges.
4. A device as claimed in any preceding claim,
- 15 in which the base has a base surface, longitudinal sides and transverse sides, and the casing element comprises a passage extending parallel to the longitudinal sides of the base, and a front surface parallel to the base surface of the base, and
- 20 projections extending from the said surface are provided with through passages for the passage of terminal screws of the terminal member and for the passage of a screwdriver for screwing the terminal screws.
- 25 5. A device as claimed in any preceding claim,
- in which the base is substantially of shallow box form, with lips being provided on the edges of opposing walls of the base for guiding the cover onto the base.
- 30 6. A device as claimed in any preceding claim, in which blind bores are provided at diametrically opposing corners of the base into which screws passing through the cover can be screwed to fix the cover to the base.
- 35 7. A device as claimed in claim 6, in which holes, through which sealing means can be inserted, are disposed both in the cover and in the base, at those corners at which the screw connections for fixing the cover to the base are
- 40 situated.
8. A device as claimed in any preceding claim, in which the base and cover are elongate and knock-out portions are provided in the ends of the cover and of the base and/or in the floor portion of
- 45 the base, which when broken out form holes for cables.
9. A device constructed substantially as herein described with reference to and as illustrated in the accompanying drawings.