

Description

5 The invention concerns a casing for an electrical device and in particular for a switch with the features indicated in the introductory part of claim 1, which is suitable for insertion in the fitting openings of switch panels.

10 Such casings are known, for example, from the DE-PS 29 28 277. The, in essence, parallelepiped-shaped casing body is inserted into a fitting opening corresponding to its cross-sectional contour from the front side of the switch panel. The front
15 covering wall of the casing body extending transversely to the insertion direction, with its surround projecting on all sides beyond the cross-sectional contour of the casing body, acts as a stop limiting insertion, which surround bears in the fitted position on the frontal edge zones of the fitting opening and covers the latter. The fixing of the casing in the final
20 fitted position is obtained by elastically sprung expansion brackets which are formed on two side walls of the casing body facing away from each other and which project outwards from the latter at an acute angle opening out against the insertion direction. Their free ends extending approximately parallel
25 to the insertion direction are at their outer side provided with a serrated locking profile which engages with the corresponding border edge of the fitting opening. Since the expansion brackets are bent inwards by their border edge as the casing body is being inserted into the fitting opening, the expansion brackets build up an outwardly directed resilient
30 force by their own elasticity by means of which the fixing of the casing is secured in the fitting opening.

35 In this known fixing, problems do arise, since a firm seat of the casing in the fitting opening is frequently not ensured over a wider range of switch panel thicknesses. However, for safety reasons, the fixing must be so strong that a removal of the device from the switch panel is prevented irrespective of its thickness, or is only possible with recourse to special
40 tools.

Starting on this basis, the object of the invention is to ensure a reliable fixing of the casing in the fitting opening of a switch panel with the most varied panel thicknesses.

45 The solution of this problem is indicated in the characterizing features of claim 1. In the fitted position of the casing, one obtains an additional outwardly directed loading force of the expansion brackets, and hence an extremely reliable engagement of the serrated locking profile with the
50 corresponding side edges of the fitting opening by means of the supporting struts at the free ends of the expansion brackets, through the bearing of these supports on the corresponding side walls. Since the generation of this addi-

tional resilient force is, in essence, independent of the panel thickness, the casing is secured in the fitting opening over a wide range of switch panel thicknesses.

5 With the design according to claim 2, one ensures that the casing can be easily inserted into the fitting opening. Moreover, by the indicated arrangement of the supporting struts, the latter are deflected transversely to their longitudinal direction. In this direction, the supporting struts have a
10 high resilience and flexibility, whereby favourable elastic properties are obtained.

15 An advantageous geometrical arrangement of the expansion brackets and of their supporting struts is obtained by the design according to claim 3. The design described represents an optimum compromise between a high retaining force and scope for an easy resilient insertion of the expansion brackets and in the long run, low material fatigue of the brackets and struts.

20 By means of the bent portions shaped according to claim 4 on the bearing ends of the supporting struts, a sliding surface is created extending approximately parallel to the corresponding side walls, which reduces the sliding resistance of the
25 supporting struts as their bearing ends slide along the side walls during the insertion of the casing into the fitting opening and the corresponding forces to be applied. Moreover, by means of this sliding surface, one prevents jamming of the supporting ends with possibly existing uneven portions
30 in the surface of the side walls of the casing, and obstructions related thereto, as the casing is inserted into the fitting opening.

35 The fixing of the casing as such is considerably improved by the design according to claim 5. On the one hand, a considerable increase in the retaining force of the expansion brackets is obtained per se by the doubling of the number of expansion brackets and on the other hand, by means of the separated expansion brackets, it is possible to compensate deviations in
40 the dimensions and shape of the fitting opening to an optimum degree. Moreover, the central gap facilitates a displacement movement of the two expansion brackets towards each other in their main plane.

45 A further improvement in the fixing of the casing is obtained by the step indicated in claim 6. Since the side edges facing away from each other of the expansion brackets project beyond the corresponding contour of the casing body, it is possible to obtain an additional engagement of the expansion
50 brackets with the longitudinal sides of the fitting opening. Thereby the casing is also secured against a lateral displacement in the fitting opening. By means of the additional serrated locking profile on the side edges facing away from

each other of the expansion brackets, one obtains an additional engagement of the expansion brackets with the fitting opening. Since in this action the expansion brackets are bent inwards in the direction towards each other - thus a direction wherein they have a high rigidity - a very high additional retaining force is achieved by the indicated design, with a drastic improvement of the fixing of the casing in the fitting opening.

To ensure that the forces to be exerted during the insertion of the casing into the fitting opening should not become unduly high, the side edges facing away from each other are provided with sliding inclined portions extending outwards (Claim 7).

The locking tooth indicated in claim 8 prevents an unauthorized forcible extraction of the casing from the fitting opening. This is only possible with a special tool, whereby it becomes possible to observe the relevant provisions regarding protection against contact. Likewise, by a pronounced counter pressure from below - for example, due to forces originating from the clamped cables - the casing can only be lifted out of the fitting opening as far as the locking teeth. A secure protection of live parts is still obtained in this position.

The invention will be explained in greater detail in an example of the embodiment with reference to the attached Figures. There are shown in :

Fig. 1 a representation of the casing in perspective,

Fig. 2 a longitudinal side view thereof,

Fig. 3 a side view from the direction of arrow III according to Figure 2,

Fig. 4 a longitudinal side view of the casing in its final fitted position and

Fig. 5 a side view of the casing from the direction of arrow V according to Figure 4.

The Figures show a switch casing (1) integrally made from an insulating material with an in essence parallelepiped casing body (2). The bottom (3) thereof is open. Through the corresponding opening (4) it is possible to insert, for example, a switch unit (not represented) and to secure it in the casing (1). The covering wall (5) of the casing body (2) has a rectangular opening (6) through which there projects the operating element - for example, a switch rocker button - of the switch unit. In the longitudinal side walls (7) various cutouts (8) are provided wherein there can engage, for

example, retaining elements on the outside of the switch unit for its mounting in the casing body (2).

5 The covering wall (5) is enlarged by a surround (9) projecting on all sides beyond the cross-sectional contour of the casing body in such a way relative to the rectangular fitting opening (10) that the surround (9) covers the frontal edge zones of the longitudinal side edges (11) and transverse side edges (12) of the fitting opening as a stop limiting insertion and
10 edge delimitation in the final fitted position of the casing body (2) (Figures 4, 5).

15 On the two narrow sides (13) of the casing body (2) facing away from each other, two expansion brackets (14) each are integrally formed in the vicinity of its bottom (3). These have an elastically sprung design and project outwards in an acute angle (16) opening out against the insertion direction (15). They have over their whole length a flat rectangular cross-section. When the switch casing (1) is not inserted,
20 the free end (17) of the expansion brackets (14) extends parallel to the insertion direction (15) (Figure 2). Each ends directly ahead of the surround (9) of the covering wall (5) and respectively has on its outer side a serrated locking profile (18) for fixing the switch casing (1) on the transverse
25 side edges (12) of the fitting opening (10).

On to the free ends (17) of the expansion brackets (14), there are integrally moulded respective supporting struts (19) which extend inwards to the corresponding narrow side walls (13) and
30 end in the position shown in Figures 1 to 3 shortly ahead of the latter. The supporting struts (19) also respectively extend in an acute angle (16') to the corresponding narrow side wall (13) opening out against the insertion direction (15). With reference to the length of the expansion brackets (14), the bearing ends (20) are arranged approximately
35 centrally. They each have a short bent portion (21) extending parallel to the insertion direction (15), which portion forms a sliding surface for the bearing ends (20) of the supporting struts (19).

40 As shown in Figures 1, 3 and 5, the two expansion brackets (14) formed on a narrow side wall (13) are interspaced from each other by a central gap (22). The aligning bar (23) is arranged in this central gap which lies in the median adjusting longitudinal plane of the switch casing (1), by means of
45 which bar, there is made available an adequate spring excursion for the expansion brackets (14). The side edges (24) facing away from each other of the free ends (17) of the expansion brackets (14) project beyond the contour of the casing body given by the dimensions of the narrow side wall (13).
50 They are provided with an additional serrated locking profile (18'). The central region of the side edges (24) of the expansion brackets (14) facing away from each other are

designed in the manner of an inclined sliding portion (25). For this purpose, the side edges (24) here extend at an acute angle against the insertion direction (15) beyond the contour of the casing body towards the outside.

Figures 4 and 5 show the final fitted position of the switch casing (1) in the fitting opening (10) of a switch panel (27). During assembly, the casing body (2) is inserted with its bottom into the fitting opening (10) from the front side (26) of the switch panel (27). In this action the two expansion brackets (14) are pushed inwards by the transverse side edges (12) of the fitting opening (10) against their outwardly directed resilient force, the supporting struts (19) of the expansion brackets (14) bearing respectively on the narrow side walls (13) of the casing body (2) and generating an additional resilient force towards the outside. The casing body (2) is inserted until the surround (9) of the covering wall (5) bears on the longitudinal side edges (11) and transverse side edges (12) of the fitting opening (10). The corresponding locking tooth of the serrated locking profile (18) engages with the corresponding border edge zones of the fitting opening (10), whereby the switch casing (1) is fixed with a very high retaining force in the fitting opening (10). Since the supporting struts (19) additionally act on the expansion brackets (14) in an outward direction, the switch casing (1) is reliably held and this independently of the thickness (d) of the switch panel. It is possible to cover thickness ranges of typically 1 - 6.3 mm.

As shown in Figure 5, because of the projection of their side edges (24), the expansion brackets (14) are additionally pushed inwards in their main plane as the casing body (2) is inserted into the fitting opening (10), whereby an expansion force is also generated in the direction towards the longitudinal side edges (11) of the fitting opening. Accordingly, the casing body (2) is additionally secured by means of the serrated locking profile (18') arranged on the side edges (24). Thus the expansion brackets (14) do not only expand against the transverse side edges (12), but also against the longitudinal side edges (11), whereby the switch casing (1) is secured against lateral displacement in the fitting opening (10). Thus a further advantage of the object of the invention lies in the fact that the play available for easy insertion of the switch casing (1) between the dimensions of the casing body (2) given by the width of the casing body and by the interspacing of the outer edges of the aligning bar (23), and the fitting opening (10) is compensated both in the longitudinal direction and the transverse direction.

Each expansion bracket (14) is respectively provided with a locking tooth (28) which is arranged next to the end pointing in the insertion direction (15) of each serrated locking profile (18). The locking teeth (28) extend transversely to

the insertion direction (15) and project outwards beyond the respective serrated locking profile (18). Thereby, with a strong pull on the casing (1) or counter pressure from below respectively against the insertion direction (15), the casing body (2) can only be lifted out of the fitting opening (10) just so far until the locking teeth (28) come to engage with the transverse side edges (12). Any further movement of the casing body (2) is only possible after the expansion brackets (14) have been pushed inwards by means of a tool.

Reference Numerals

	1	switch casing
	2	casing body
15	3	bottom
	4	opening
	5	covering wall
	6	opening
20	7	longitudinal side wall
	8	cutout
	9	surround
	10	fitting opening
	11	longitudinal side edge
	12	transverse side edge
25	13	narrow side wall
	14	expansion bracket
	15	insertion direction
	16, 16'	angle
	17	free end
30	18, 18'	serrated locking profile
	19	supporting strut
	20	bearing end
	21	bent portion
	22	central gap
35	23	aligning bar
	24	side edge
	25	sliding inclined portion
	26	front
	27	switch panel
40	28	locking tooth
	d =	thickness



CLAIMS

1. A casing for an electrical device, in particular for a switch, for insertion in the fitting openings (10) of switch panels (27) with an, in essence, parallelepiped-shaped casing body (2) which can be inserted through the fitting opening (10),

- whose front covering wall (5) extending transversely to the insertion direction (15) is enlarged by a surround (9) projecting on all sides beyond the cross-sectional contour of the casing body (2), in such a way that the surround covers the frontal edge zones (11, 12) of the respective fitting opening (10) as a stop limiting insertion and edge delimitation when the casing (1) is mounted, and

- which has on at least two side walls (13) facing away from each other, expansion brackets (14) which are each elastically sprung,

- which brackets project outwards in an acute angle (16) opening out against the insertion direction (15) from the corresponding side walls (13),

- whose free ends (17) extending preferably parallel to the insertion direction (15)

- end respectively directly in front of the surround (9) of the covering wall (5) and

- respectively have on their outer side a serrated locking profile (18) for fixing the casing (the switch casing 1) on the border edges (11, 12) of the fitting opening (10),

characterized in that

supporting struts (19) are respectively moulded on to the free ends (17) of the expansion brackets (14),

- which struts extend inwards towards the corresponding side walls (13) and

- which bear elastically on the side wall (13) with their bearing ends (20) at least when the casing (1) is in its final fitted position.

2. A casing according to claim 1,

characterized in that

the supporting struts (19) extend respectively in an acute angle (16') opening out against the insertion direction.



towards the corresponding side wall (13).

3. A casing according to claim 2,

characterized in that

the bearing ends (20) of the supporting struts (19) are arranged approximately centrally with reference to the length of the expansion brackets (14).

4. A casing according to claim 2 or 3,

characterized in that

a respective bent portion (21) extending parallel to the insertion direction (15), is shaped on the bearing ends (20) of the supporting struts (19).

5. A casing according to one of the preceding claims,

characterized in that

two expansion brackets (14) lying next to each other are formed respectively on the side walls (narrow side walls 13) facing away from each other, of the casing body (2) which brackets are separated from each other by a central gap (22).

6. A casing according to claim 5,

characterized in that

the side edges (24) facing away from each other of the free ends (17) of the expansion brackets (14) project beyond the corresponding contour of the casing body and are provided with an additional serrated locking profile (18').

7. A casing according to claim 6,

characterized in that

the side edges (24) facing away from each other of the expansion brackets (14) are formed at least partly as sliding inclined portions (25) extending outwards in an acute angle against the insertion direction (15) beyond the corresponding contour of the casing body (2).

8. A casing according to one of the preceding claims.

characterized by

one locking tooth (28) respectively on each expansion bracket (14) which



- is arranged next to the end of the serrated locking profile (18) pointing in the insertion direction (15),
- and extends transversely to the insertion direction (15) and projects outwards beyond the respective serrated locking profile (18).