

Description

The invention relates to an electrical installation device, which is fixed in a flush-mounting wall installation box with the aid of an expanding-claw mounting, of the type mentioned in the precharacterizing clause of Claim 1.

Expanding-claw mountings for installation devices to be installed in flush-mounting wall installation boxes, such as switches, buttons, sockets, dimmers and the like, are known in numerous embodiments. By tightening the adjusting screws arranged at the support ring as is known, the expanding claws are spread away from the installation device, during which process expanding-claw points arranged at the ends become buried in the wall of the flush-mounting boxes and anchor the installation device.

As is known from German Utility Model 1,913,681, the installation devices are usually completed by a rubber ring which is pushed over the base of the installation device in such a manner that its expanding claws are held closely to the base when the adjusting screw is unscrewed. This considerably facilitates the insertion of the installation device into the flush-mounting box. If there were no such rubber ring, the expanding claws would considerably impair or even prohibit the insertion of the installation device due to their mobility. This is because the loose expanding claw has the tendency of spreading further by itself in certain positions of the installation device or with the slightest contact of the wall installation box as a result of which the installation is sometimes actually prevented.

The disadvantageous factor in this is that the rubber ring loses its elasticity and decays with time due to temperature and humidity fluctuations. This impairs installation if a relatively long time elapses between the production of the installation device and its final

flush-mounting installation. And if the installation device remains in the wall installation box for a relatively long time as is usually intended, the dismantling of the installation device also becomes cumbersome because of the then restricted functional capability of the rubber ring since first the expanding claw must be disengaged from the box wall before the installation device can be extracted.

From German Offenlegungsschrift 2,611,654, an expanding-claw mounting is known which attempts to avoid the disadvantages described for the use of rubber rings by using a metal spring clip. The metal clip spring is attached to the support ring in such a manner that the expanding claws rest closely against the base with the adjusting screw unscrewed. When the adjusting screws are tightened, the expanding claws swivel outwards against the force of the spring legs of the metal clip spring and engage the flush-mounting box with their points. When the adjusting screws are unscrewed, the spring force of the metal spring clip presses the expanding claws back into the rest position at the device base as a result of which the device can then be extracted from the flush-mounting box without impairment.

DE-A-2,051,184 and EP-A1-0,071,104 disclose expanding mountings for electrical installation devices, in which the expanding parts are in each case acted upon by a leaf-spring which is supported on parts of the support ring, or is attached to these, and is aligned in parallel with an expanding leg.

The relatively problematic installation of the springs and expanding parts is to be regarded as disadvantageous in the known configurations.

Based on the prior art described above, the present invention has the object of developing the expanding claws of the expanding-claw mounting of the generic installation device, avoiding the disadvantages described in the prior art, in such a manner that a stable and durable expanding-claw restoration is ensured,

with unscrewed adjusting screw, with simple means, an expenditure which is supportable in production and with an installation which is easily managed, which considerably facilitates both the installation and the dismantling of the installation device.

This object is achieved by the features characterized in greater detail in the independent Claims 1 and 2. Advantageous embodiments are characterized in greater detail in the subclaims.

In the text which follows, the invention will be explained in greater detail and described with reference to the drawing, in which:

Figure 1 shows a side view of a socket base to be installed in a flush-mounting wall installation box with an unscrewed adjusting screw and with a tightened adjusting screw of the expanding-claw mounting,

Figure 2 shows a perspective view of a conventional expanding claw,

Figure 3 shows a top view of the expanding claw according to the invention, and

Figure 4 shows a sectional view of the expanding claw according to the invention corresponding to the section line IV-IV drawn in Figure 3.

Figure 1 shows as an illustrative embodiment the side view of a base 14 to be installed in a flush-mounting wall installation box including earth clip 15 of a socket. The base 14 is attached to a support ring 12. Adjusting screws 9 are carried in the base 14. A spreading of expanding claws 1 can be achieved by tightening the adjusting screws 9 whilst a restoration of the expanding claws 1 is achieved by unscrewing the adjusting screws 9 due to the spring restoring force of a leaf spring 2. The left-hand adjusting screw 9 in Figure 1 is unscrewed. The expanding claw 1, the position of which can be changed by it, rests closely against the base 14. The right-hand adjusting screw 9 in Figure 1 is tightened. The expanding claw 1 guided by it is spread away from the base 14 and then causes the installation

device to be anchored in the flush-mounting wall installation box.

Figure 2 shows a conventional expanding claw 1 with a first expanding-claw leg 3 and a second expanding-claw leg 4. The adjusting screw 9 is passed through an adjusting-screw hole 8 which fixes the expanding claw 1 at the base 14. Claws 11 are formed at the free end of the second expanding-claw leg 4.

Figure 3 shows a top view of the expanding claw according to the invention with the leaf spring 2 attached to the second expanding-claw leg 4. A strengthening fin 16 ensures that an expanding-claw bending angle α , at which the first expanding-claw leg 3 is angled with respect to the second expanding-claw leg 4, is maintained even under load.

Figure 4 shows a sectional view through the expanding claw 1 according to the invention, with leaf spring 2 according to the section line IV-IV in Figure 3. The expanding claw 1 exhibits the first expanding-claw leg 3 which is angled at the expanding-claw bending angle α with respect to the second expanding-claw leg 4. In the first expanding-claw leg 3, the adjusting screw hole 8 is formed by means of which the adjusting screw 9 guided through the adjusting screw hole 8 fixes the expanding claw 1 at the base 14. The free end of a second leaf-spring leg 6 of the spring-elastic leaf-spring 2 is attached on the second expanding-claw leg 4. For this purpose, a penetration 10 is formed in the second expanding-claw leg 4 the protruding edge of which is spread or beaded on the leaf-spring 2 to be attached. The penetration 10, however, can also be constructed as rivet hole into which the rivet shaft of a hollow rivet can be inserted for the purpose of riveting the leaf-spring 2 to the expanding claw 1. Apart from riveting, spreading or beading, the leaf-spring 2 can also be attached, among other things, by welding, bonding or clamping to the expanding claw 1. The leaf-spring 2 exhibits a first leaf-spring leg 5 which is angled at a leaf-spring

bending angle $\beta < \alpha$ with respect to the second leaf-spring leg 6. The second leaf-spring leg 6 and the second expanding claw leg 4 are aligned in parallel. At the free end of the first leaf-spring leg 5, a sliding arc piece 7 is formed which rests on parts of the support ring 12, particularly a spacing web 13 of the support ring 12 and is supported there with pretension.

According to a further illustrative embodiment, not shown here, the free end of the first leaf-spring leg 5 of the spring-elastic leaf-spring 2 can also be attached to parts of the support ring 12. In this arrangement, the second leaf-spring leg 6 and the second expanding-claw leg 4 are also aligned in parallel. The first leaf-spring leg 5 is angled at the leaf-spring bending angle $\beta < \alpha$ with respect to the second leaf-spring leg 6. At the free end of the second leaf-spring leg 6, a sliding arc piece 7 resting on the second expanding-claw leg 4 and supported there with pretension is formed. Advantageously, the support ring 12 and the associated leaf-spring 2 are constructed in one piece of uniform material in this further illustrative embodiment. This results in further production and installation advantages.

The operation of the expanding-claw mounting according to the invention will be described in the text which follows. As can be seen, particularly from Figure 1, the expanding claw 1 rests closely against the base 14 with the adjusting screw 9 unscrewed since the pretension effected by the bending of the leaf-spring 2 presses the expanding-claw 1 against the base 14. In this condition, a simple installation and dismantling of the installation device is possible. When the installation device is inserted in the flush-mounting box, the expanding-claw 1 is spread away by tightening the adjusting screws 9 as a result of which the sliding arc piece 7 of the leaf-spring 2 slides slightly upwards on the spacing web 13 of the support ring 12.

Installation and dismantling of the installation device without problems is ensured by constructing the expanding-claw mounting according to the invention with an expanding-claw restoration which is stabilized by the
5 leaf-spring 2.

List of reference designations

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|----|----|---------------------------|
| | 1 | Expanding-claw |
| | 2 | Leaf-spring |
| | 3 | First expanding-claw leg |
| 5 | 4 | Second expanding-claw leg |
| | 5 | First leaf-spring leg |
| | 6 | Second leaf-spring leg |
| | 7 | Sliding arc piece |
| | 8 | Adjusting screw hole |
| 10 | 9 | Adjusting screw |
| | 10 | Penetration |
| | 11 | Claw |
| | 12 | Support ring |
| | 13 | Distance web of 12 |
| 15 | 14 | Socket base |
| | 15 | Earth clip |
| | 16 | Strengthening fin |



Patent Claims

1. Electrical installation device, which is fixed in a flush-mounting wall installation box with the aid of an expanding-claw mounting, comprising a support ring (12) and two expanding-claws (1) which are arranged opposite one another in pairs at this ring and are in each case acted upon by a leaf-spring (2), the first expanding-claw leg (3) of which is attached to parts of the support ring (12) by means of an adjusting screw (9) and the second expanding-claw leg (4) of which is angled at an expanding-claw bending angle α with respect to the first expanding-claw leg (3), the second expanding-claw leg (4) and a second leaf-spring leg being aligned in parallel, characterized in that the free end of the second leaf-spring leg (6) of the spring-elastic leaf-spring (2) is attached on the second expanding-claw leg (4), in which arrangement the second leaf-spring leg (6) is angled at a leaf-spring bending angle $\beta < \alpha$ with respect to a first leaf-spring leg (5) of the leaf-spring (2), and in that a sliding arc piece (7) resting on parts of the support ring (12) and supported there under pretension is formed at the free end of the first leaf-spring leg (5).

2. Electrical installation device according to the precharacterizing clause of Claim 1, in which the leaf-springs (2) are attached to parts of the support ring (12), characterized in that a second leaf-spring leg (6) and the second expanding-claw leg (4) are aligned in parallel and in that the second leaf-spring leg (6) is angled at a leaf-spring bending angle $\beta < \alpha$ with respect to the first leaf-spring leg (5) of the leaf-spring (2), and in that a sliding arc piece (7) resting on the second expanding-claw leg (4) and supported there with pretension is formed at the free end of the second leaf-spring leg (6).

3. Electrical installation device according to Claim 1, characterized in that the respective expanding-claw (1) and the associated leaf-spring (2) are constructed in one piece of uniform material.



4. Electrical installation device according to Claim 2, characterized in that the support ring (12) and the associated leaf-spring (2) are constructed in one piece of uniform material.