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Electrical Installation DeviceDescription

The invention relates to an electrical installation device for the concealed wall-flush installation in a wall mounting box inserted in a wall with a supporting ring fixed on a female connector, the electrical installation device being fastened on holding brackets of the wall mounting box.

When mounting concealed installation apparatuses, so-called wall mounting boxes are normally being used. In general, wall mounting boxes are round hollow cylinders with standard dimensions such as height and diameter. They are inserted into prefabricated holes (e.g. by boring), and, if required, fixed in the wall with plaster or mortar.

As to installation works carried out in Germany, as a rule wall mounting boxes made from insulating materials, mainly from plastic, are used which are flush with the wall i.e. the mounting surface of the respective installation wall, whereas in other countries as in Great Britain, for instance, metal installation boxes standardized by the manufacturer are used, often having a rectangular cross section.

In general, fastening of installation apparatuses in these wall boxes is made by means of screws that bite into the tapholes provided in brackets located opposite to each other at the interior wall of the installation boxes and which serve as a support for the installation apparatus pertaining to this box. These holding and supporting brackets, depending on the manufacturer, are provided in varying distances from the front box edge, ranging from 5 to 7 mm.

Furthermore it has to be observed in this connection, that the installation of the wall mounting boxes is normally made before the plasterwork is done. This entails the problem that the plaster thickness is not always constant but likely to vary between 1 to 2 mm. This tolerance has also to be considered when selecting the respective intermediate ring.

Based upon this state of the art it is the objective of the invention to provide an installation apparatus of the kind described before, which, during the wall-flush installation of the installation apparatus, serves to bridge in a simple and cost-saving way the distances resulting between the holding brackets and the mounting surface and hence offers the possibility to mount foreign installation devices by means of a supporting ring, i.e. those installation apparatuses that normally are supported on the mounting surface by means of their supporting ring.

According to the invention this task is accomplished by the characteristic features of Claim No. 1. An intermediate ring, therefore, is provided, which is inserted between the wall mounting box and the supporting ring to compensate the distance between the holding brackets of the wall mounting box and the wall. In this case the ring is provided with through holes matching with the borings in the holding brackets, through which the fastening screws are passing for fixing the supporting ring of the installation apparatus onto the holding brackets.

The intermediate ring is preferably designed as a plane ring with two opposite faces matching both with the supporting ring and the holding brackets.

According to a development of the invention at least one contact side of the intermediate ring is provided with a couple of diametrically opposite strengthenings or recesses in order to compensate the distance between the holding brackets of the wall mounting box and the wall. This means that the entire ring has a thickness equal to the distance to be bridged but that the compensation is achieved only by local recesses (reduced cross section) or strengthenings with parallel contact surfaces on the ring.

Independent of the shaping of the intermediate ring, i.e. ring with recesses or strengthenings, the resulting thickness of which - for the strengthening inclusive of the thickness of the unstrengthened ring - equals the distance to be compensated, it is, in addition, possible to make a fine adjustment by mechanical abrasion of the contact surfaces, e.g. by means of a file.

According to the invention, each recess or strengthening is, therefore, provided with a corresponding boring for the pertaining fastening screw, through which the holding screw provided for the fastening of the installation apparatus in question is passing and biting into the corresponding holding bracket in the wall mounting box.

As a rule, the aforementioned recess for the holding screw is a boring, but for ease of installation it is also possible to use a lateral slot. A further simplification of the invention consists in that the intermediate ring is designed as a split ring with lateral slot cutouts provided for the holding screws, and which preferably consists of two matching pieces which, during installation, are put against the

respective installation apparatus before being put on to the mounting box.

According to an advantageous embodiment of the invention the recesses respectively strengthenings are provided on both sides, which significantly increases the variation range of the intermediate ring according to the invention.

According to a further version both contact surfaces of the intermediate ring can be equipped with paired diametrically opposed recesses respectively strengthenings. This makes it possible to bridge at least four different distances, i.e. a first and a second distance by means of the strengthenings on one contact surface and a third and a fourth distance by means of the strengthenings on the other contact surface.

In this case it is provided that the strengthenings on the same contact surface situated opposite to each other have the same thickness whereas strengthenings adjacent to each other on the same contact surface of the intermediate ring have different thicknesses.

A further preferred version provides a circular intermediate ring which can be shaped in the same way as described before. This variant, however, allows a further version, for which on both contact surfaces of the intermediate ring paired diametrically opposed recesses respectively strengthenings are located which are shifted to each other by at least 45° . In this variant more than two paired diametrically opposed recesses respectively strengthenings can be located on each contact surface.

In order to further simplify the handling of the intermediate ring according to the invention, the thicknesses of the recesses respectively strengthenings are laid out stepwise between each other, preferably with steps of 1 mm difference from one strengthening to the other.

By means of the stepwise shaping in accordance to the invention and an appropriate arrangement of the step increments of the strengthenings on both contact surfaces of the intermediate ring it is ensured that distances upto 10 mm, mainly between 5 and 10 mm, can be compensated.

The ring is preferably matching with the cross section of the mounting box in question, i.e. its shape is also rectangular, the holding brackets normally being centrically arranged on the corresponding side of the mounting box. According to the invention, however, it is basically possible to also use circular intermediate rings, the outside diameter of which corresponds to the inside diameter of the mounting box in question.

The word „diametrically“, by the way, is used both for the rectangular and the circular intermediate rings, and the point is always that the supporting points of the intermediate ring are opposed to each other either dissymmetrically or in linear symmetry.

An advantageous development of the invention is characterized in that the recesses respectively strengthenings on both contact sides of the intermediate ring are shaped differently; in this case it can furthermore be provided that the strengthenings on one of the contact sides of the intermediate ring are

shifted against the recesses respectively strengthenings on the other contact side.

According to a further version of the invention it is also possible to have recesses on one contact side of the intermediate ring and to have, on the other contact side of the ring, strengthenings on the perimeter shifted against the recesses.

These advantageous versions and improvements of the invention and further ones as well are subject of the subclaims.

By means of an embodiment example shown in the drawing, the invention, advantageous versions and improvements thereof and particular advantages of the invention shall be explained and described in detail.

It is shown in:

- Fig. 1 a longitudinal section of an installation apparatus installed in a mounting wall with an intermediate ring as per the invention;
- Fig. 2 a rectangular section in top view as per the invention;
- Fig. 3 a side view of the intermediate ring as per Fig. 2;
- Fig. 4 a further side view of the intermediate ring as per Fig. 2, and
- Fig. 5 a circular intermediate ring in accordance to the invention.

Fig. 1 schematically shows an electrical installation apparatus 10, not specified in detail, provided for a concealed installation, e.g. a socket with a cover 11. This installation apparatus is inserted in a hole 13 of an installation surface 12 containing a mounting box 14. As usual, the electrical installation apparatus 10 is equipped with a female connector 16 on which a supporting ring 18 is fixed.

As a rule, the electrical installation apparatus 10 is inserted with its female connector 16 into the mounting box 14 located in the hole 13, the supporting ring 18 with its front face being put against the mounting surface 12, thus ensuring a fixed position of the device.

The example shown here, however, relates to such a version of the mounting box 14 the inside diameter of

which exceeds the diameter of the supporting ring 20, and not that version with a smaller diameter, as standardized in Germany, for instance, so that a conventional way of mounting is not possible. Instead of this, the mounting box 14 as given is provided for the mounting of special installation apparatuses that are not shown here in detail. For this purpose, holding brackets 20 at the interior wall and bent inwards, i.e. showing radially towards the center, are provided at a defined distance from the front edge, thus serving as a support for the particular installation apparatus in question.

However, to properly insert an installation apparatus 10 equipped with a supporting ring 18 conforming to German Standards into a mounting box 14 already available on site, the invention here provides an intermediate ring 22 to bridge the gap between the mounting surface 12 and the holding brackets 20 provided in the mounting box 14.

The intermediate ring can either be a rectangular ring 14, according to the top view shown in Fig. 2 or a circular ring 15 according to Fig. 5. In both cases the distance between the holding bracket 20 and the edge of the opening 13 (i.e. the mounting surface 12) is bridged by an appropriate shaping of the intermediate ring 14, 15.

As per the example shown in Fig. 2 the intermediate ring 14 is equipped with recesses 28, 30, situated diametrically opposite to each other, which are forming one contact surface each, cooperating with the holding bracket 20 in the mounting box 14. According to the invention, the recesses 28, 30, being diametrically opposite to each other, have the same stay thickness, i.e. the same thickness between the contact surface

28,30 and the unchanged surface of the ring 24, 26, which is particularly shown in Fig. 3.

In both cases the ring 14 as shown in the example has such a thickness that the distance between the opposite contact surfaces 24, 26 is bigger than the distance between one contact surface 28, 30 and the opposite contact side 26, respectively between two contact surfaces 28, 32 opposite to each other as per Fig. 4.

Fig. 3 gives the vertical side view of the intermediate ring 14 shown in Fig. 2, which clearly shows that the intermediate ring 14 is equipped with a recess 30 only on one contact surface 24, which serves as a support face 30 for the holding bracket 20.

Fig. 4, on the other hand, shows the horizontal side view of the intermediate ring 14 as per Fig. 2, the horizontal sides of which are equipped with recesses 28, 32 of different depths. Thus it is clearly shown in Fig. 4 that the individual bridging thickness to be bridged results from the difference of the overall thickness of the intermediate ring 14 reduced by the depth of the allocated recess.

As an alternative to a rectangular intermediate ring 14 it is, of course, also possible to use a circular intermediate ring 15 as per Fig. 5, which offers the advantage that on one contact side 24, 26 three different contact surfaces 34, 36, 38 can be formed instead of only two as is the case with the rectangular intermediate ring 14.

A further variation possibility for the shaping of the intermediate ring 14, 15 is given by strengthenings provided on the unchanged intermediate ring 14, 15 (to be considered as a basic ring) instead of recesses 28,

30, 32, 34, 36, 38. In this case the contact surfaces 28, 30, 32, 34, 36, 38 are not sunk-in but are protruding, i.e. they are forming projections of different heights. It is, however, advisable in this case to shift the strengthenings on the contact side 24 on the perimeter against those on the opposite contact side 26.

To this variant, too, the same basic principle of the invention applies that strengthenings situated diametrically opposite to each other on the same contact side 24, 26 are always of the same height, according to the depth of the recesses 28, 30, 32, 34, 36.



Patent Claims

1. Electrical installation device (10) for the concealed wall-flush installation in a wall mounting box (14) inserted in a wall (12) with a supporting ring (18) fixed on a female connector (16), the electrical installation device (10) being fastened on holding brackets (20) of the wall mounting box, characterized in that an intermediate ring (14, 15) is provided, which is inserted between the holding bracket (20) in the wall mounting box (14) and the supporting ring (18) and bridges the distance between the holding brackets (20) of the wall mounting box (14) and the wall (12).

2. Installation device according to Claim 1, characterized in that the intermediate ring (14, 15) provided as a plane ring with two opposite contact sides (24, 26).

3. Installation device according to Claim 1 or 2, characterized in that at least on one contact side (24, 26) of the intermediate ring (14, 15) a pair of recesses situated diametrically opposite (28, 20, 32, 34, 36) or protrusions with contact surfaces is provided compensating the distance between the holding brackets (20) of the wall mounting box (14) and the surface of the wall (12).

4. Installation device according to Claim 1 or 2, characterized in that on both contact sides (24, 26) of the intermediate ring (14, 15) paired protrusions are provided diametrically opposite which are displaced against each other, respectively, by at least 45°.

5. Installation device according to Claim 4, characterized in that the recesses diametrically opposite to each other (28, 30, 32, 34, 36) or protrusions on the same contact side (24, 26) are of the same dimensions, whereas recesses (28, 30, 32, 34, 36) or protrusions adjacent to each other on the same contact side of the intermediate ring are of different dimensions.





6. Installation device according to Claim 5, characterized in that the dimensional differences are realized in increments.

7. Installation device according to one of the preceeding claims, characterized in that the recesses (28, 30, 32, 34, 36) or protrusions are provided on both contact sides (24, 26) of the intermediate ring (14, 15).

8. Installation device according to one of the preceeding claims, characterized in that the recesses (28, 30, 32, 34, 36) or protrusions on both contact sides (24, 26) of the intermediate ring (14, 15) are laid out differently.

9. Installation device according to one of the preceeding claims, characterized in that the recesses (28, 30, 32, 34, 36) or protrusions on one of the contact sides (24, 26) of the intermediate ring (15) are shifted against the recesses (28, 30, 32, 34, 36) or recesses on the orther contact side.

10. Installation device according to one of the preceeding claims, characterized in that the stepwise increments of the recesses (28, 30, 32, 34, 36) or protrusions on both contact sides (24, 26) of the intermediate ring (14, 15) are provided in such a way that distances between 5 and 10 mm can be compensated.

11. Installation device according to one of the preceeding claims, characterized in that the intermediate ring (14) is provided rectangularly.

12. Installation device according to one of the Claims 1 to 10, characterized in that the intermediate ring (15) is provided circularly.

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