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(54) Benævnelse: **INSTALLATIONSDÅSE TIL ELEKTRISK INSTALLATION**

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Installation box for electrical installation

The present invention relates to an installation box according to the preamble of Claim 1.

Such an installation box is known, which consists of a pot-shaped box with an inner insert. The dimensions of the inner insert are adapted for a form-fitting insertion into the interior of the pot-shaped box.

The pot-shaped box is made of intumescent material. An inner insert is inserted into this pot-shaped box. The inner insert is also a pot-shaped box here, made of the plastic materials that are usually used for installation boxes.

Document EP 2 472 685 B1 describes an installation box for cavity wall installation, which consists of an outer box into which an inner box made of intumescent material can be inserted. The dimensions of the inner box are adapted to the outer box in such a way that it can be inserted into the outer box in a form-fitting manner. An embodiment of the inner box is described which is designed in such a way that this inner box itself has no base and thus only extends as a sleeve in the region of the outer box on the inner side thereof in which the outer box is cylindrical. The inner box has openings here at the points where cables or installation pipes are to be inserted into the installation box.

Document GB 2 325 728 A describes an electrical installation material, which is designed as an accommodation space for the installation of luminaires in hollow ceilings. A pot-shaped installation part is made of ceramic or metal and coated on its inner side with an intumescent material. The electrical installation material also has openings for ventilation and for heat dissipation.

Document DE 20 2016 104 239 U1 describes an installation box which is made of plastic and has a coating made of intumescent material on its outer side.

Document DE 20 2014 104 064 U1 describes an installation box which in its interior has a recess into which an element made of an intumescent material can be

inserted.

Such installation boxes can be designed as so-called cavity wall boxes. These cavity wall boxes are used in cavity wall constructions, in which the cavity wall construction is built as a post and beam construction, which is then provided with a corresponding boarding. Circular openings are made in this boarding and the cavity wall installation boxes are inserted into these openings. These cavity wall installation boxes are pot-shaped with a circular opening and a contact shoulder for contact with the outer side of the boarding. The cavity wall installation box is inserted into a precisely fitting opening. These cavity wall installation boxes are used, for example, for mounting and for contacting light switches and plug sockets.

Due to the defined mounting positions for the light switches and the plug sockets, the electrical installation for adjacent rooms that are separated by a cavity wall construction may require that the openings for the light switches and possibly also for the plug sockets of the adjacent rooms be made mirror-inverted at the same position of the two boardings of the cavity wall. This has proven to be problematic with regard to fire protection because smoke gases and possibly also open flames can spread from one room to the neighbouring room through these openings. This also applies if the boarding of the cavity wall construction furthermore has a fire resistance of class F90.

Therefore, it is intended that the known installation box has an outer insert made of intumescent material. This intumescent material - usually so-called expanded graphite - expands greatly when heated. This closes the opening that would otherwise result from the opening of the installation box. The transfer of smoke gases or even open flames from one room into a neighbouring room is thus advantageously avoided. In this embodiment, the intumescent material is on the outer side of the installation box inside the cavity wall. During expansion, the intumescent material supports itself against filling materials inside the cavity wall. This filling material can be rock wool or glass wool. This filling material is inserted as supplementary fire protection and also for thermal and sound insulation. It is further known to provide an outer structure for the installation box made of

fireproof material. The intumescent material can be supported here on the outer structure of the installation box, so that the installation box becomes independent of further installation conditions. This relates in particular to the effect that the intumescent material expands when heated so that the opening is closed.

Such fire protection boxes are not only used in cavity wall installations. There may also be on-site environmental conditions where the walls are solid but only have a small thickness of, for example, 10 cm. With such walls, too, there is the problem that the installation opening for the installation boxes is more or less completely drilled through this thin wall during the electrical installation of light switches in neighbouring rooms. Also with these installation conditions, the same problem exists with regard to fire protection as with cavity wall installations.

The object of the present invention is to simplify the structure of the installation box.

This object is achieved according to the present invention according to Claim 1 by an installation box for the electrical installation, consisting of a pot-shaped box having an inner insert. The dimensions of the inner insert are adapted for a form-fitting insert into the interior of the pot-shaped box. Furthermore, the inner insert consists at least partially of an intumescent material. According to the invention, a form-fitting locking snap connection having at least one resiliently mounted locking means is arranged on the inner insert or the pot-shaped box. This locking means interacts with a counter-locking means which is correspondingly attached to the pot-shaped box or the inner insert.

In this embodiment according to the present invention, the pot-shaped box is made of plastic material that is commonly used for installation boxes, in particular for cavity wall installation boxes. This material can be, for example, polypropylene, in particular long-fibre polypropylene.

The installation box according to the present invention is constructed in such a way that the pot-shaped box (i.e. the "outer part" of the installation box) is made of

plastic material which is commonly used for installation boxes, in particular for cavity wall installations. The inner insert is at least partially made of an intumescent material.

For the installation box according to the present invention, it is important that the pot-shaped box is made of a sufficiently temperature-resistant material. The intumescent material starts to expand at a temperature of 200 degrees Celsius. This means that the pot-shaped box must be made of a material that remains dimensionally stable up to about 250 or 300 degrees Celsius and provides sufficient support for the expanding intumescent material so that the intumescent material expands into the opening and thus seals this opening.

Thus, the installation box according to the present invention has some significant advantages.

The separate manufacture of the pot-shaped box and the inner insert simplifies the manufacture compared to coating a box with the intumescent material. With a coating, the temperatures in the manufacturing process must be precisely maintained so that the intumescent material does not inflate already during manufacture. These problems are avoided with the separate manufacture of the pot-shaped box and the inner insert.

In the assembled installation box, the pot-shaped box provides the support for the case that the intumescent material expands. In the box according to the present invention, the support for the intumescent material is provided by the installation boxes themselves. This means that the installation box can also be used in cavity wall constructions which are built entirely without filling material for the cavity wall. The lack of support for the intumescent material inside the cavity wall is then of no practical importance, because the installation box itself provides sufficient support for the expanding intumescent material.

Nevertheless, the installation box according to the present invention is only composed of two parts arranged one inside the other.

The spring-mounted locking means advantageously ensures that the inner insert is held firmly in its desired position in the pot-shaped box during assembly.

In the installation box according to Claim 2, the inner insert consists of a sleeve, the dimensions of which are adapted to the pot-shaped box such that the inner insert, after being inserted into the pot-shaped box, is located in the region of the pot-shaped box in which it is cylindrical.

This has proven to be advantageous in that the inner insert can thus be easily produced. The amount of intumescent material is nevertheless sufficient here to close the opening by the expanding intumescent material.

This embodiment has also proven to be advantageous because the places where cables and possibly installation pipes are to be inserted into the installation box are usually located in the bottom region of the pot-shaped box. These places are advantageously kept free of the inner insert, so that the insertion of the cables and/or empty conduits is possible in a simple manner.

In the embodiment according to Claim 3, the inner insert comprises recesses and/or break-out surfaces in the regions on which, with an inner insert inserted into the pot-shaped box, break-out surfaces or flexible coverings are present over openings in the pot-shaped box for the introduction of cables or installation pipes into the installation box.

For installation boxes it is known to provide break-out surfaces that have predetermined breaking points. This allows these break-out surfaces to be broken open so that openings are created in the wall of the installation box through which cables or empty conduits can be inserted into the installation box. As an alternative to these break-out surfaces, these openings in the installation box can also be covered by elastic plastic. The elastic plastic can also be injected into the openings as a membrane. It is also possible to provide inserts made of elastic plastic that can be inserted into the openings in the installation box. It is then possible to provide

the break-out surfaces. If cables or empty conduits are to be inserted, the corresponding break-out surfaces can be broken out. The resulting holes can be closed again by the inserts made of the elastic plastic. The cables or empty conduits can then be pushed through the elastic plastic.

If the inner insert has recesses precisely at these points, an inner insert can be designed in such a way that this inner insert covers the inner surface of the pot-shaped box as much as possible, but still leaves the places free where cables or empty conduits are possibly to be inserted into the installation box.

In the embodiment according to Claim 4, the installation box comprises a circular inlet opening having a circumferential contact shoulder. A circular ring made of intumescent material is arranged on the underside of the contact shoulder.

This embodiment effectively closes the filling of the opening in the boarding of the cavity wall or in the hole in the wall by the expanding intumescent material.

In the embodiment according to Claim 5, a ring of intumescent material is located on the outside of the pot-shaped box on the side of the circular opening of the pot-shaped box.

This embodiment according to Claim 5 can, alternatively or additionally to the embodiment according to Claim 4, effectively close the opening in the boarding of the cavity wall or in the hole in the wall.

An exemplary embodiment of the invention is shown in the drawing, which shows in detail:

Fig. 1: a first embodiment of a pot-shaped box with an inner part and

Fig. 2: the pot-shaped box with the inserted inner part in a plan view of the installation box in the direction of insertion for light switches, plug socket inserts or other electrotechnical or electronic components to be installed.

Figure 1 shows a first embodiment of a pot-shaped box 1 with an inner part 2.

It can be seen that the dimensions and shape of the inner part 2 are such that this inner part 2 can be inserted into the pot-shaped box in a form-fitting manner.

As described at the outset, the inner part 2 is made of intumescent material. The pot-shaped box 1 consists of common plastics used for the production of installation boxes. This can be, for example, a PP long fibre (polypropylene - long fibre). Such a plastic has a temperature stability of up to approximately 250 degrees Celsius. Temperature stability here means that the material does not deform and is still sufficiently dimensionally stable to form an abutment for the expanding intumescent material so that this intumescent material expands into the opening of the installation box and fills it. This creates a safeguard against escaping smoke gases and also against escaping flames.

It can be seen that both the pot-shaped box 1 and the inner part 2 have respective regions 101 and 201 which are provided for the insertion of cables or empty conduits into the installation box. As discussed in the introduction to the description, the regions 101 are formed as break-out surfaces or are coated with elastic plastic so that the cables or empty conduits to be inserted can be pushed into the installation box through this elastic plastic.

Alternatively, the openings of the regions 101 can also be injected with a membrane made of soft plastic. Insert pieces made of soft plastic can also be inserted into these regions after the corresponding break-out surfaces have been opened.

This has proven to be advantageous because the cables or empty conduits are enclosed by the soft-elastic plastic. This has advantages in terms of reducing sound transmission and also in terms of minimizing draughts. In case of fire, this sealing of elastic material already seals the installation box before the intumescent material is inserted.

The corresponding regions 201 correspond to the regions 101 of the pot-shaped box in such a way that the regions 101 and 201 lie one above the other when the inner part 2 is inserted into the pot-shaped box 1 and also correspond in terms of their size in each case, insofar as these regions 101 and 201 lie one above the other.

The inner part 2 has mounting holes 202 into which screws can be screwed in a manner known *per se* for fastening frame elements of electrotechnical or electronic components to be inserted.

In addition, the pot-shaped box 1 and the inner part 2 have corresponding receptacles 203, 103 for mounting screws. These mounting screws run in the recesses 102 and 204 of both the pot-shaped box 1 and the inner part 2. By tightening the mounting screws, clamping claws are attracted from the underside of the installation box which, when tightened, extend outwards beyond the outer circumference of the installation box and thereby engage behind the boarding of the cavity wall for fastening the installation box.

As described at the outset, intumescent material may also be applied in the region of the contact shoulder 104 on the side of the pot-shaped box 1 facing the boarding.

Figure 2 shows the pot-shaped box 1 with the inserted inner part 2 in a plan view of the installation box in the direction of insertion for light switches, plug socket inserts or other electrotechnical or electronic components to be installed. The same components as in Figure 1 are denoted by identical reference signs.

Patentkrav

1. Installationsdåse til elektrisk installation, bestående af en potteformet dåse (1) med en indvendig indsats (2),

> hvor den indvendige indsats (2) i sine dimensioner er tilpasset til en formsluttende indsats i det indvendige af den potteformede dåse (1),
> hvor den indvendige indsats (2) i det mindste delvist består af et intumescerende materiale.

kendetegnet ved, at der er anbragt en formsluttende låsende indgrebsforbindelse med mindst en fjederelastisk lejret indgrebsmekanisme på den indvendige indsats (2) eller den potteformede dåse (1), som arbejder sammen med en modindgrebsmekanisme på den potteformede dåse (1) eller den indvendige indsats (2).

2. Installationsdåse ifølge krav 1,
kendetegnet ved, at den indvendige indsats (2) består af en muffe, hvis dimensioner er tilpasset den potteformede dåse (1), sådan at den indvendige indsats (2) efter indsættelsen i den potteformede dåse befinder sig i den potteformede dåse (1) i det område af den potteformede dåse (1), i hvilken den er cylinderformet.

3. Installationsdåse ifølge krav 1 eller 2,
kendetegnet ved, at den indvendige indsats (2) har udsparinger og/eller afbrækningsflader (201) i de områder, hvor der ved en indvendig indsats (2) indsat i den potteformede dåse (1) er afbrækningsflader eller fleksible overdækninger (101) over åbninger i den potteformede dåse (1) til indføring af kabler eller installationsrør i installationsdåsen.

4. Installationsdåse ifølge et af kravene 1 til 3,
kendetegnet ved, at installationsdåsen har en cirkelformet indgangsåbning med en omløbende kontaktskulder (104), hvor der på undersiden af kontaktskulderen (104) er anbragt en cirkelformet ring af intumescerende materiale.

5. Installationsdåse ifølge et af kravene 1 til 4,
kendetegnet ved, at der på ydersiden af den potteformede dåse (1) på siden af den cirkelformede åbning i den potteformede dåse (1) befinder sig en ring af intumescerende materiale.

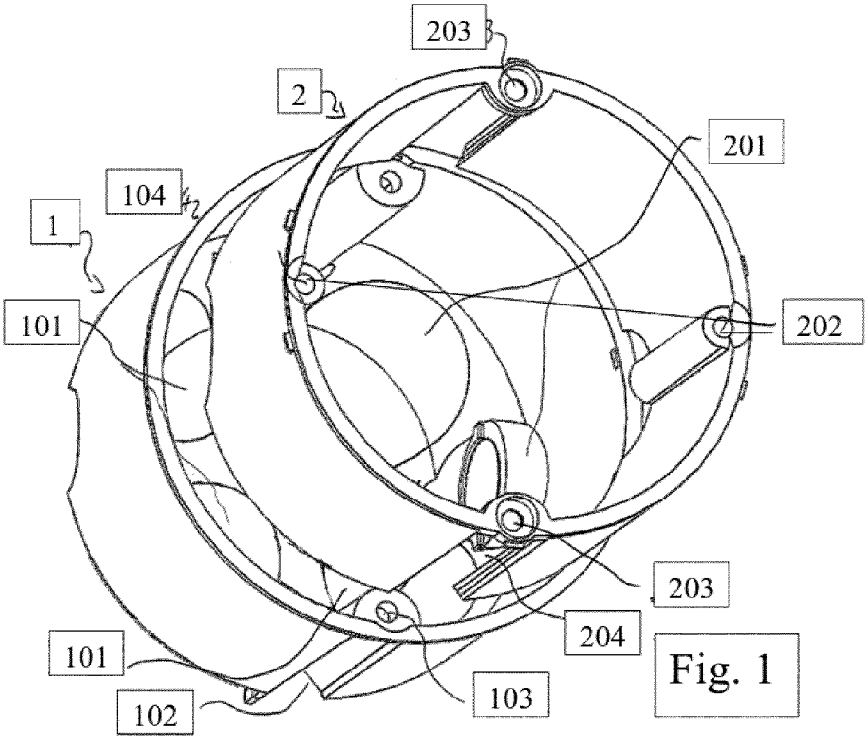

Fig. 1

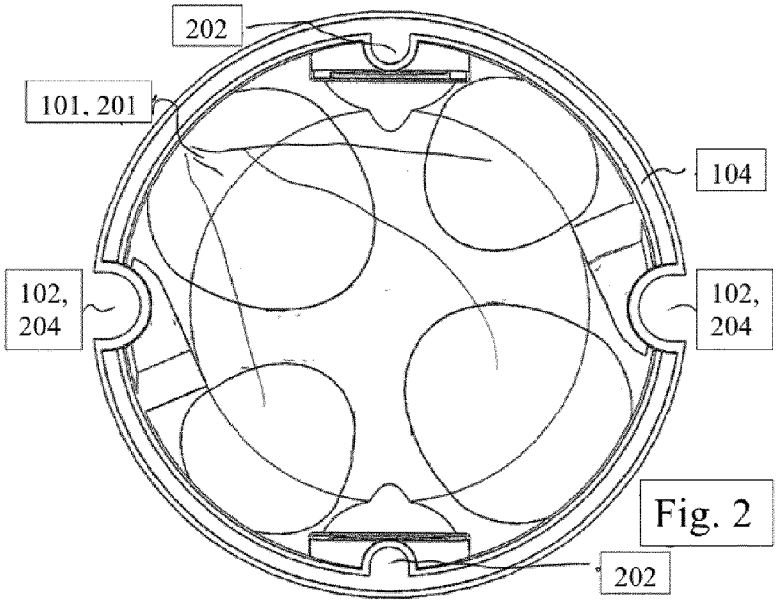

Fig. 2