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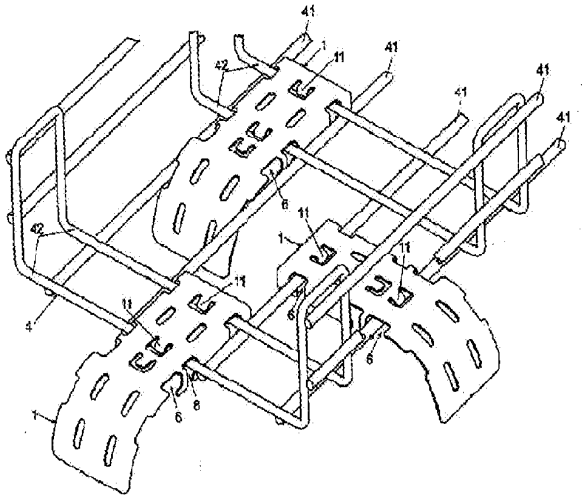
(71) Aanvrager(s):
Schneider Electric España S.A. te Barcelona, Spanje (ES).

(72) Uitvinder(s):
Ernesto Chenoll Mora te Barcelona (ES).

(74) Gemachtigde:
Drs. M.J. Hatzmann c.s. te Den Haag.

(54) **Cable drop out device in cable trays.**

(57) The invention relates to a cable drop out device in cable trays, which allows a quick fixing on the base of cable trays (4) formed by longitudinal wires (41) and transverse wires (42), and comprising a body (1) having a flat portion (2) extending at its front end in a downward curved portion (3), and means for the fixing thereof to the wires (41, 42) of the tray (4), in which the curved portion (3) is wider than the flat portion (2) and has on the opposite sides (31) respective partial open works (7), arranged under the plane defined by the flat portion (2) of the device, forming a channel for supporting the cables of an electric installation and allowing the downward deviation of said cables.



NL A 2003991

CABLE DROP OUT DEVICE IN CABLE TRAYS

Object of the Invention

The present invention relates to a cable drop out device for cable trays, the purpose which lies in being formed as a quick fixing element in the base of cable trays, of the type referred to as grid trays, which are formed by rods or wires, called chain rods or wires, which are longitudinally arranged, and rods or wires, called weft rods or wires, which are U-shaped and transversely arranged, such that they form a channel for housing and supporting the cables of a hanging electric installation, and such specifically that the cables present in the installation are to be deviated downwards.

Background of the Invention

Different devices intended for the same purpose as that of the present invention are known, the following background documents being emphasized:

Utility Model ES1060615 U describes an improved grid tray in which specific features of the tray are claimed, mentioning in the specification an accessory, depicted in Figure 3, facilitating the downward extraction of the cables located in the tray. According to what is depicted in the mentioned Figure 3, this accessory has a considerably constant a width between its larger sides and has projections emerging from the lower face of the device, oriented towards its front area, for the coupling thereof in either longitudinal wires or, by default, in transverse wires arranged in the base of the grid tray. The uniformity of width in the entire the length of the accessory determines that in the assembly position between two contiguous wires of the tray, the curved end serving as support for the downward cables has a smaller width than the separation between the inner faces of said wires with the evident risk that the cables laterally shift during their installation or handling and that they are pinched between the curved edges of the accessory and the longitudinal wires arranged on the sides of said edges, which can cause the rubbing and deterioration of the cables. On the other hand, in the accessory of the mentioned Utility Model ES1060615 U, the actuation of the actual weight of the cables on the downward curved area can cause shifting the accessory towards its rear end, with its subsequent release from the wires housed in the fixing projections oriented in the opposite direction, i.e., towards the front area of the accessory.

Utility Model ES1035372 U describes a device for deviating a cable

downwards from a grid which supports it in the raised position and which incorporates, among others, on its back side a recess at a right angle extending along half the length of said back side, the other half having two wings forming a cavity for receiving a transverse wire of the base of the tray and in its respective side edges vertical wings parallel with its upper parts bent outwardly at a different height to engage on respective longitudinal wires close to the base of the tray. This device has the drawback that its stable fixing is limited to those areas of the cable tray in which there are longitudinal and transverse wires. The stable fixing of this device requires the actuation on the wires of the tray of the upper arms which originate from the opposite sides of the curved or downward area, limiting its assembly to an intermediate position in the tray and preventing the curved or downward position from being able to be arranged in cantilever at one of the ends or sides of the tray, distancing the downward cables from the cable tray.

Description of the Invention

The cable drop out device for cable trays, being of the type intended to be positioned on cable trays formed by longitudinal wires and transverse wires and comprising a body of considerably constant thickness having a flat portion extending at its front end in a downward curved portion, and means for the fixing thereof to the wires of the base of the cable tray, has constructive particularities aimed at allowing its stable fixing either on longitudinal wires or on transverse wires of the tray, without the assembly limitations of the mentioned background documents.

Another objective of the invention is to allow the assembly of the device both in an intermediate area of the base of the cable tray, and in cantilever assembly, in this case the curved portion of the body of the device projecting on one of the ends or on one of the sides of the cable tray.

Another objective of the invention is to prevent the uncontrolled longitudinal shifting of the device with respect to the tray due to the pushing caused by the actuation of the weight of the cables on the curved portion of the body of the device.

Another objective of the invention is to provide the curved portion of the device with sufficient width so as to prevent pinching the cables between the opposite sides of said curved portion and the fixing wires, typical of the base of the tray, when said wires are laterally placed against the device.

To that end and in accordance with the features of the invention described

in the claims, the curved portion of the body is wider than the flat portion and has on the opposite sides respective open works or partial trimming, arranged under the plane defined by the flat portion of the device.

The possibility that said partial open works are symmetrical and are made to allow the passage through each of them of a longitudinal wire of the base of the tray is contemplated.

The distance between the two opposite sides of the mentioned curved portion is greater than that existing between the inner faces of two contiguous longitudinal wires of the base of the cable tray and does not exceed the distance between the outer faces of said two contiguous longitudinal wires, which allows arranging in said curved portion a larger support surface for the downward cables and preventing pinching the cables between the sides of the curved portion and the mentioned longitudinal wires arranged on both sides of the device.

According to the invention, the partial open works of the curved portion are delimited above by respective support flanges on respective longitudinal wires of the cable tray, which contributes to stabilizing the device in the assembly position on the tray.

Said partial open works define, in a modular use of the device, and by means of the arrangement of two devices laterally placed against one another, an assembled orifice for the passage of the mentioned longitudinal wires.

In turn, the flat portion extends on the longer opposite sides of the body of the device, in respective downward walls intended to be positioned between respective contiguous longitudinal or transverse wires, longer opposite sides (21) the position thereof in the cable tray.

Each of the mentioned downward walls of the flat portion has at least three notches defining a lower opening for the insertion of two longitudinal wires or, by default, two transverse wires and a housing for their positioning in the device in collaboration with longitudinal appendages delimited by said notches in the longitudinal appendages of the downward walls.

In one embodiment of the invention, the notches of the downward walls partially affect the flat portion.

The definition in the downward walls of at least three notches suitably distanced in the longitudinal direction allows fixing the device on two longitudinal wires or on two transverse wires, using in each case that pair of notches the separation of which corresponds with that of the wires of assembly.

In accordance with the invention, the rear longitudinal appendage of the downward walls and the intermediate longitudinal appendage form means for fixing the device on two contiguous transverse wires, whereas the rear longitudinal appendage and the front longitudinal appendage form means for fixing the device on two contiguous longitudinal wires.

In the assembly position of the device, the rear longitudinal appendage externally clamps a longitudinal or transverse wire of the base of the tray.

In one embodiment of the invention, the longitudinal appendages of the downward walls of the flat portion are equal to one another, allowing their assembly indistinctly on longitudinal wires or on transverse wires.

The possibility that the mentioned longitudinal appendages of the downward walls are oriented towards the curved portion or front end of the body of the device or towards the start of the flat portion is contemplated.

The flat portion of the mentioned body has at least three cuts, longitudinally distributed in accordance with the notches of the downward walls. Said cuts delimit flanges which can be deformed towards the lower area forming respective front retaining stops of the longitudinal or transverse wires housed in the respective grooves of the mentioned notches, preventing the device from being able to shift towards the rear area and accidentally being released from the wires housed in the grooves of the notches.

In one embodiment of the invention, the body of the device is metallic, although its formation in other materials is not discarded.

The invention also relates to a cable tray including at least one cable drop out device according to the invention.

Description of the Drawings

To complement the description being made and for the purpose of aiding understanding of the features of the invention, a set of drawings is attached to the present specification in which the following has been depicted with an illustrative and non-limiting character:

- Figure 1 shows a perspective view of an embodiment of the device of the invention.
- Figure 2 shows an upper plan view of the device of the previous figure.
- Figure 3 shows a side view of the device of the previous figures.
- Figure 4 shows a perspective view of the device of the invention

assembled in different positions on the base of a cable tray.

- Figure 5 shows a side view of the device in the use position assembled on transverse wires of a cable tray, vertically sectioned to allow showing the transverse wires housed in two of the grooves defined by the notches of the downward walls of the flat portion.

- Figure 6 shows an upper plan view of two devices laterally placed against one another fixed to the transverse wires of the base of a cable tray and arranged between consecutive longitudinal wires of said cable tray.

Preferred Embodiment of the Invention

As can be seen in the mentioned figures, the device of the invention comprises a body (1) of considerably constant thickness with a flat portion (2) extending at its front end in a curved portion (3) which is wider than the flat portion (2) and having on its opposite sides (31) partial open works (7), arranged under the plane defined by the flat portion (2) of the device.

Said partial open works (7) are preferably symmetrical and are made to allow the passage through each of them of a longitudinal wire (41) of the base of the cable tray (4).

In the use position, the flat portion (2) is arranged in a plane parallel to the base of the cable tray (4), the curved portion (3) projecting towards the lower area of the tray (4).

As can be seen in the attached figures, the distance between the two opposite sides (31) of the curved portion (3) is greater than that existing between the inner faces of two contiguous longitudinal wires (41) of the base of the cable tray (4) and does not exceed the distance existing between the outer faces of said contiguous longitudinal wires (41), which allows arranging in said curved portion (3) a larger support surface for the downward cables and preventing pinching such cables between the opposite sides (31) of the curved portion (3) and the mentioned longitudinal wires (41) arranged on both sides of the device.

The mentioned partial open works (7) of the curved portion are delimited above by respective support flanges (8) made to be seated on the respective longitudinal wires (41) of the base of the cable tray.

As shown in Figure 6, the presence of these open works (7) allows the body (1) to be modular and, having another body (1) contiguous to the previous one, allows the partial open works (7) of both bodies to form a through orifice (9) for the passage of the mentioned longitudinal wires (41) without the need to modify the

body (1) or even without the need of making a cut in the longitudinal wire (41) to allow its assembly, when two bodies (1) are to be arranged in an intermediate area of a tray (4).

The flat portion (2) extends on the longer opposite sides (21) in respective downward walls (5) intended to be positioned between the inner faces of respective contiguous longitudinal wires (41) or transverse wires (42), depending on the assembly position thereof in the tray (4).

Each of the downward walls (5) incorporates at least three notches (6) defining a lower opening (61) for the insertion of two longitudinal wires (41) or, by default, two transverse wires (42) and a housing (62) for their positioning in the device in collaboration with longitudinal appendages (51) delimited by said notches in the lower ends of the downward walls (5).

The housings (62) in collaboration with the respective longitudinal appendages (51) prevent the body (1) from being able to be released from the wires housed in the housings (62), both in the upward direction and in the same direction in which the longitudinal appendages (51) of the side walls (5) are oriented.

The notches (6) of the downward walls (5) also partially affect the flat portion (2).

The downward walls (5) of the flat portion (2) are always arranged between the inner faces of two contiguous longitudinal wires (41) or contiguous transverse wires (42), depending on the position thereof in the tray (4).

The width dimensions of the flat portion (2), i.e., the distance existing between the two longer opposite sides (21) of the flat portion (2), are not greater than the separation existing between the inner faces of two contiguous longitudinal wires (41) present in the base of the tray (4).

In addition, the distance existing between the two opposite sides (31) of the curved portion (3) is greater than that existing between the two longer opposite sides (21) of the flat portion (2) and in turn does not exceed that existing between the two outer faces of two contiguous longitudinal wires (41).

The longitudinal appendages (51) of the downward walls (5) of the flat portion (2) are directed towards the curved portion (3) and are preferably equal to one another.

The rear longitudinal appendage (51), arranged closer to the start of the flat portion (2), externally clamps the longitudinal wire (41) or transverse wire (42) of

the base of the tray (4).

As shown in Figure 4, the rear longitudinal appendage (51), arranged closer to the start of the flat portion (2), acts together with the intermediate longitudinal appendage (51) when the device is assembled on transverse wires (42), and together with the front longitudinal appendage (51), closest to the curved portion (3), when the device is assembled on longitudinal wires (41).

As is shown in the attached figures, the flat portion has at least three cuts (10), longitudinally distributed in accordance with the notches (6) of the downward walls (5), delimiting flanges (11) which can be deformed towards the lower area forming respective retaining stops of the longitudinal wires (41) or of the transverse wires (42) housed in the respective grooves (62) of the notches (6), assuring the retention of the body (1) in the assembly position on the cable tray (4).

Although the body (1) is preferably metallic, it can be made of any other material.

Having sufficient described the nature of the invention, as well as a preferred embodiment, it is hereby stated for all effects and purposes that the materials, shape, size and arrangement of the described elements can be modified provided that such modification does not alter the essential features of the invention which are claimed below.

Conclusies

1. Kabeluitvoerinrichting voor kabelgoten, van het type bedoeld om te worden gepositioneerd aan de basis van kabelgoten (4) van longitudinale draden (41) en transversale draden (42), en een lichaam (1) van in hoofdzaak constante dikte omvattend met een vlak deel (2) dat zich aan de voorzijde uitstrekt in een neerwaarts gekromd deel (3), en middelen voor het bevestigen daarvan aan de draden (41, 42) van de kabelgoot (4), met het kenmerk dat het gekromde deel (3) breder is dan het vlakke deel (2) en aan de tegenoverliggende zijden (31) respectieve gedeeltelijk opengewerkte delen (7) heeft, gelegen onder het vlak gedefinieerd door het vlakke deel (2) van de inrichting.

2. Kabeluitvoerinrichting voor kabelgoten volgens conclusie 1, met het kenmerk dat de gedeeltelijk opengewerkte delen (7) symmetrisch zijn en zijn gemaakt om het passeren van een longitudinale draad (41) van de kabelgoot (4) door elk daarvan toe te staan.

3. Kabeluitvoerinrichting voor kabelgoten volgens een der conclusies 1 en 2, met het kenmerk dat de afstand tussen de twee tegenoverliggende zijden (31) van het gekromde deel (3) groter is dan die bestaat tussen de binnenvlakken van twee naburige longitudinale draden (41) van de kabelgoot (4) en de afstand tussen de buitenvlakken van de genoemde twee longitudinale draden (41) niet overschrijdt.

4. Kabeluitvoerinrichting voor kabelgoten volgens een der voorgaande conclusies, met het kenmerk dat de gedeeltelijke opengewerkte delen (7) van het gekromde deel (3) aan de bovenzijde begrensd zijn door respectieve steunflenzen (8) op respectieve longitudinale draden (41) van de kabelgoot (4).

5. Kabeluitvoerinrichting voor kabelgoten volgens een der voorgaande conclusies, met het kenmerk dat de gedeeltelijk opengewerkte delen (7) door middel van de positionering van twee lateraal tegen elkaar geplaatste

inrichtingen een samengestelde opening (9) definiëren voor het passeren van de genoemde longitudinale draden (41).

6. Kabeluitvoerinrichting voor kabelgoten volgens een der voorgaande conclusies, met het kenmerk dat het vlakke deel (2) van het lichaam (1) zich aan de tegenoverliggende zijden (21) uitstrekt in respectieve neerwaartse wanden (5) bedoeld om tussen de binnenvlakken van naburige respectieve longitudinale draden (41) te zijn gepositioneerd, afhankelijk van de assemblagepositie daarvan in de kabelgoot (4).

7. Kabeluitvoerinrichting voor kabelgoten volgens conclusie 6, met het kenmerk dat elk van de neerwaartse wanden (5) van het vlakke deel (2) ten minste drie uitsparingen (6) omvat die een onderste opening (61) definiëren voor het inbrengen van tweelongitudinale draden (41) of in, standaard, twee transversale draden (42) en een behuizing (62) voor hun positionering in de inrichting in samenwerking met longitudinale uitsteeksels (51) die zijn begrensd door die uitsparingen (6) in de onderstel einden van de van de neerwaartse wanden (5).

8. Kabeluitvoerinrichting voor kabelgoten volgens conclusie 7, met het kenmerk dat de uitsparingen (6) van de neerwaartse wanden ten dele het vlakke deel (2) van het lichaam (1) bestrijken.

9. Kabeluitvoerinrichting voor kabelgoten volgens conclusie 7 of 8, met het kenmerk dat de achterste en middelste longitudinale uitsteeksels (51) van de neerwaartse wanden (5) middelen vormen voor het bevestigen van de inrichting aan twee naburige transversale draden (42) van de kabelgoot (4).

10. Kabeluitvoerinrichting voor kabelgoten volgens conclusie 7 of 8, met het kenmerk dat de achterste en voorste longitudinale uitsteeksels (51) van de neerwaartse wanden (5) middelen vormen voor het bevestigen van de inrichting aan twee naburige transversale draden (42) van de kabelgoot (4).

11. Kabeluitvoerinrichting voor kabelgoten volgens conclusie 9 of 10, met het kenmerk dat in de assemblagepositie het achterste longitudinale uitsteeksel

(51) een longitudinale draad (41) of transversale draad (42) van de basis van de kabelgoot (4) uitwendig klemt.

12. Kabeluitvoerinrichting voor kabelgoten volgens een der conclusies 7, 9, 10 en 11, met het kenmerk, dat de longitudinale uitsteeksels (51) van de neerwaartse wanden (5) van het vlakke deel (2) aan elkaar gelijk zijn.

13. Kabeluitvoerinrichting voor kabelgoten volgens een der conclusies 7, 9, 10, 11 en 12, met het kenmerk, dat de longitudinale uitsteeksels (51) van de neerwaartse wanden (5) van het vlakke deel (2) naar het gekromde deel zijn gericht.

14. Kabeluitvoerinrichting voor kabelgoten volgens conclusie 7, met het kenmerk dat het vlakke deel (2) ten minste drie sneden (10) heeft die longitudinaal zijn verdeeld in overeenstemming met de uitsparingen (6) van de neerwaartse wanden (5) en die flenzen (11) begrenzen die naar het onderste gebied kunnen worden vervormd en respectieve vasthoudstoppers vormen van de longitudinale draden (41) of van de transversale draden (42) die in de respective groeven (62) van de uitsparingen (6) zijn opgenomen.

15. Kabelgoot omvattende ten minste een kabeluitvoerinrichting volgens een der conclusies 1-14.

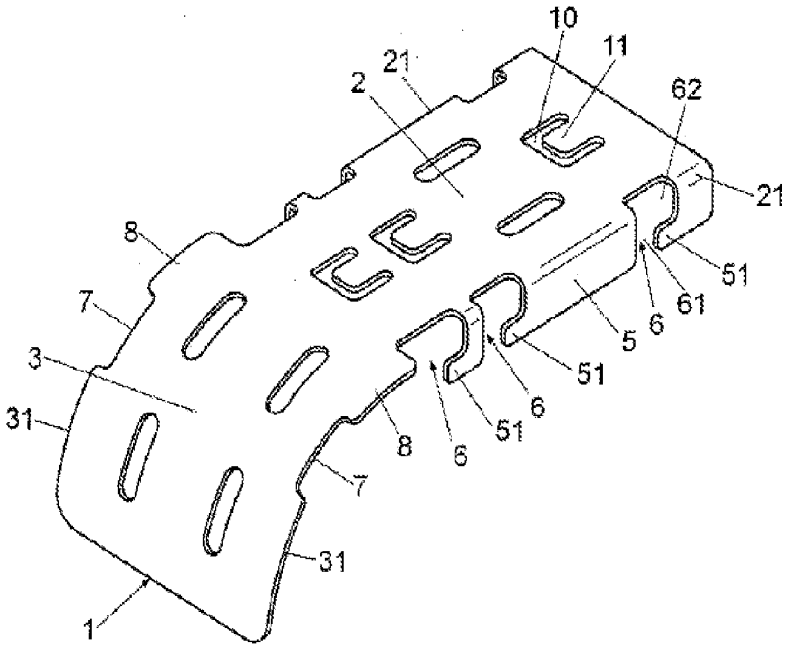

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Fig. 1

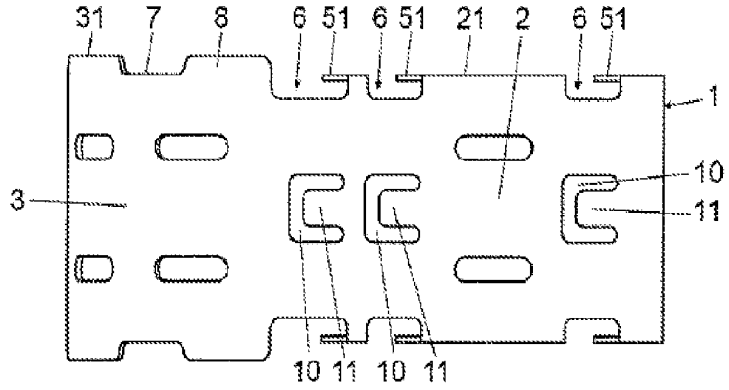
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Fig. 2

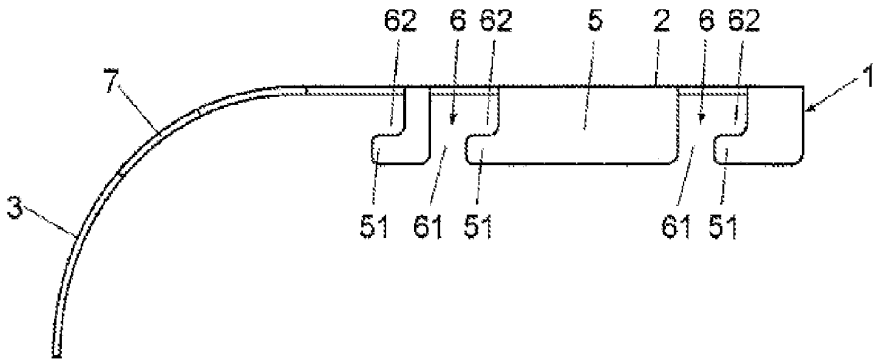

Fig. 3

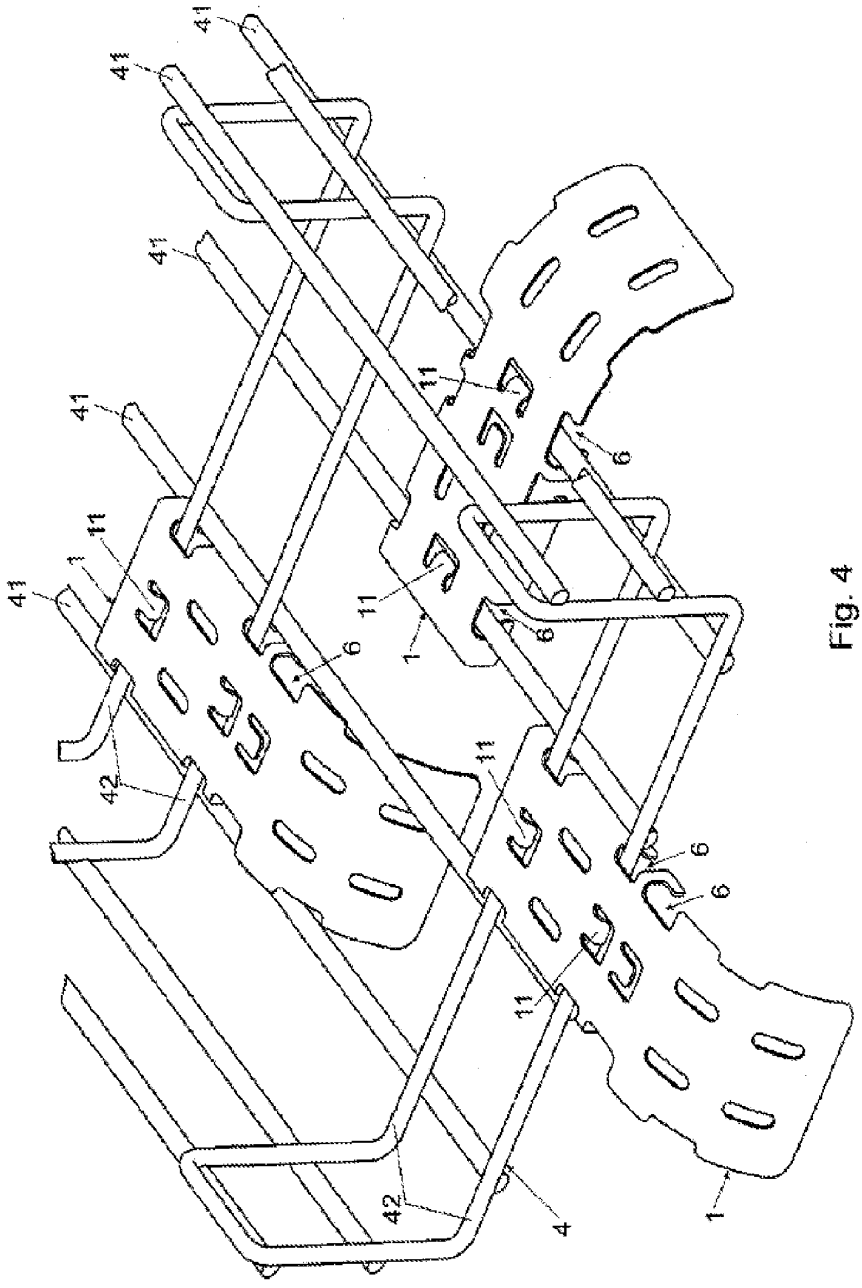

Fig. 4

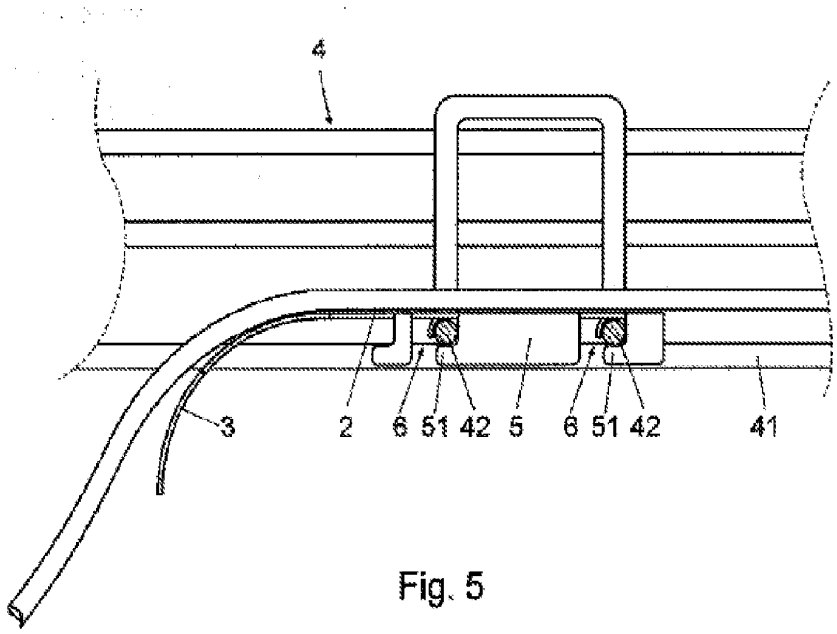

Fig. 5

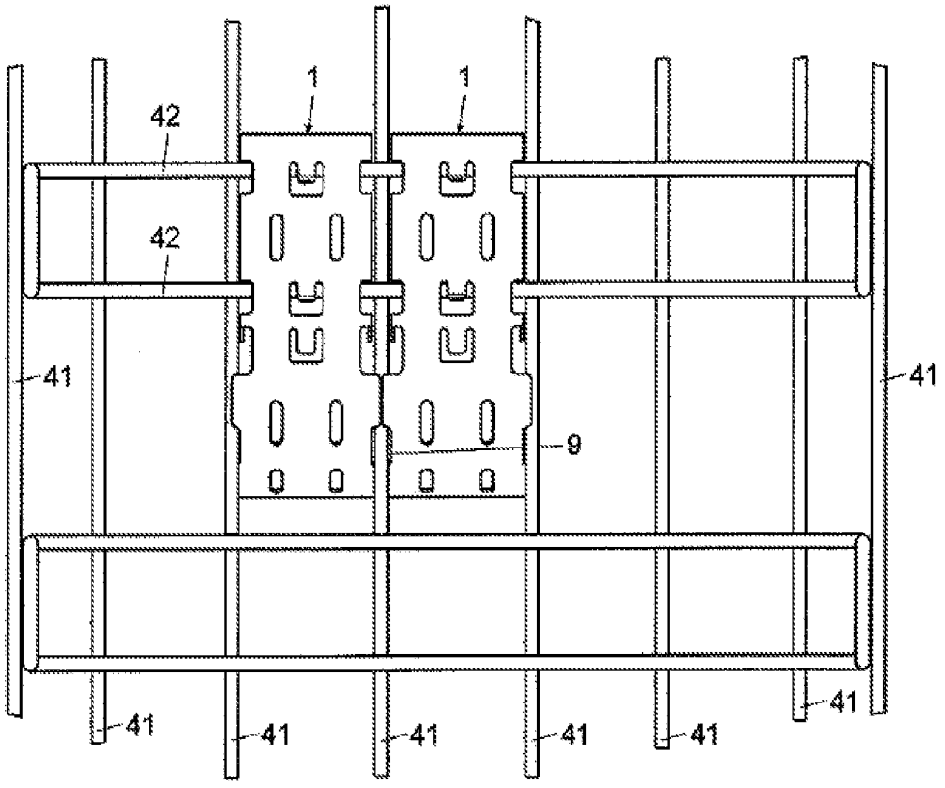

Fig. 6