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## (54) Arrangement and method for attaching a device into a planar surface structure

(57) The object of the invention is an arrangement and a method for fastening a device onto a planar surface structure, such as onto a wall. The invention is most preferably applicable for the fastening of a drying rack which is to be heated by electricity or by circulating water. In the solution according to the invention, an inner portion is used which is fastened on one hand onto a wall and on the other hand onto a fastening support of the drying rack. The drying rack with its inner portions is placed for a moment at a desired mounting spot, in which case the inner portions become attached and remain at their proper places by adhesive attachment. The inner portions can thereafter be fastened with screws onto the wall without the drying rack or a stencil. Finally, the drying rack is set at its place and fastened to the inner portions, in which case the screws which have been fastened into the wall get covered and are protected from splash water.

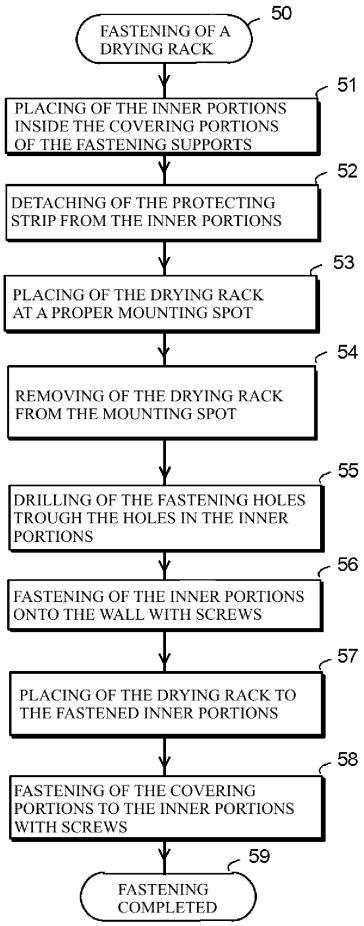


FIG. 5

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## Description

FIELD OF THE INVENTION

**[0001]** Generally this invention relates to an arrangement and a method for fastening a device onto a planar surface structure, such as onto a wall of a building. The invention is most preferably applicable for the fastening of a drying rack which is to be heated by electricity or by circulating water.

BACKGROUND OF THE INVENTION

**[0002]** For example, in bathrooms drying racks are used which can be fastened onto the wall and on which one can hang a towel to be dried. The drying racks are often heatable, in which case the structure of the drying rack contains an electric resistance or a circulating water piping with its electrical/water connection. The drying rack can be shaped, for example, as a ladder, which is installed parallel to the wall, at a distance from the wall. To achieve a fastening, there are fastening supports in the drying rack, and at the end parts of them there are fastening flanges which will be against the wall. The fastening flanges are fastened onto the wall at the mounting holes in the fastening flanges with fastening screws.

**[0003]** There are some disadvantages associated with the prior known fastening method. Firstly, the screw-heads of the fastening screws remain visible on the surface of the fastening flange. This stands against the general objective that the fastening screws should remain hidden. Secondly, the fastening screws penetrate the dampproof course in the wall, and there is the risk that through the screws/screw holes, some dampness can gain access to the wall structure.

**[0004]** Furthermore, the fastening of the prior known drying rack is awkward, because the drying rack has to be supported at its proper mounting place while the places of the mounting holes are being marked on the wall. Alternatively, a separate stencil has to be used. Then there exists also the risk that the drying rack or the stencil moves slightly during the markings and some of the marks will be erroneous. When the mounting holes have been drilled into the wall, the drying rack has to be supported again when the fastening screws are being screwed tightly.

SUMMARY OF THE INVENTION

**[0005]** The objective of the present invention is to alleviate the above mentioned disadvantages associated with the prior art.

**[0006]** The objective of the invention is achieved by an arrangement for fastening a device onto a planar surface structure, and this device comprises a fastening support, at the end of which there is a covering portion, and this arrangement is **characterized in that** it comprises:

- an inner portion which is to be placed inside the covering portion at least partly and in which there is a first opening for fastening the inner portion onto the surface structure, for example, with a screw;
- fastening means for fastening the inner portion and the covering portion to each other;
- an adhesive sticker on the surface of the inner portion for the attachment of the inner portion to the surface structure while the inner portion is being fastened onto the surface structure through the first opening.

**[0007]** The objective of the invention is also obtained by a method for fastening a device onto a planar surface structure, and this method is **characterized in that**:

- the inner portion is placed inside the covering portion of the fastening support;
- the adhesive surface of the inner portion is revealed;
- the device is placed at a desired mounting spot in the surface structure;
- the device is removed from the mounting spot while the inner portions remain in the surface structure;
- the inner portion is fastened onto the wall structure through the first opening in the inner portion;
- the device is placed into the inner portion which has been fastened onto the wall structure, and
- the covering portion and the inner portion are fastened to each other.

**[0008]** Some preferable embodiments of the invention have been disclosed in the dependent claims.

**[0009]** The invention is most usefully applicable for the mounting of a drying rack, preferably a drying rack which can be heated by electricity or by circulating water, into a wall structure.

**[0010]** Several advantages are achieved by means of the invention. Because, for example, the inner portions of the drying rack will become attached to the surface structure at first by means of an adhesive sticker in the inner portion, the drying rack need not be supported while the inner portions are being fastened to the surface structure, for example, with screws. By means of the invention it can also be ensured that the fastening will be at the right spots in the surface structure, because the drying rack itself is used as a stencil and all the inner portions stick to the surface of the wall simultaneously.

**[0011]** By means of the covering portion in the fastening support, the screw-heads of the fastening screws which are going to be in the wall can be hidden. Furthermore, the covering portion acts as a splash water shield

and thus reduces the risk of dampness gaining access to the wall structure through the fastening screws.

**[0012]** By means of the invention, the electric cable of the electrically heated drying rack can be directed either through the inner portion to the cable conduit in the wall or from the side of the inner portion to the surface of the wall. There is an opening for the cable which reaches from the edge to the bottom of the inner portion, and there can be a thinning in the side of the covering portion of the fastening support, and by removing it, an opening can be formed. Thus it is possible to use various methods for the electrical connection.

**[0013]** According to one embodiment, the inner portion and the covering portion of the fastening support are fastened to each other by a screw fastening on the side. Thus a device, such as a drying rack, is easy to detach and to fasten when necessary also after the initial mounting.

## BRIEF DESCRIPTION OF THE FIGURES

**[0014]** In the following, the preferable embodiment of the invention will be described in more detail with reference to the attached figures in which

figure 1a shows a drying rack which has a fastening support with its covering portion and a separate inner portion;

figure 1b shows the drying rack according to figure 1a, and in the covering portion of it an inner portion has been placed;

figure 2a shows a top view of the inner portion of the drying rack;

figure 2b shows a cross section of the inner portion of the drying rack;

figure 3a shows the drying rack and from the side of its fastening support an electric cable is directed;

figure 3b shows the drying rack according to figure 3a in which an inner portion has been placed in the covering portion of the fastening support;

figure 3c shows the drying rack, and from the end of its fastening support an electric cable is directed to the cable conduit of the wall;

figure 4a shows a top view of the inner portion of the drying rack where there is an opening for the electric cable;

figure 4b shows a sectional view of the inner portion of the drying rack where there is an opening for the electric cable; and

figure 5 shows a flowchart of a method according to the invention for fastening the drying rack onto the wall.

## A MORE DETAILED DESCRIPTION OF THE EMBODIMENTS

**[0015]** Figures 1a and 1b show a fastening arrangement of the drying rack according to the invention when an electric cable is not directed via the fastening. Figures 2a and 2b show in more detail the inner portion used in the arrangement. The drying rack shown in the figures is a ladder, and in its vertical rods 11 there are fastening supports 12. The fastening support is tubular, and its length determines the distance which will be between the drying rack and the wall. At the end of the fastening support there is a covering portion 14, the inside of which is sized to accommodate the inner portion 20. In the arrangement shown in the figure, the inner portion fits inside the covering portion almost in its entirety, but it is also possible that the covering portion covers the inner portion only partly.

**[0016]** The covering portion and the inner portion are fastened to each other with a screw 29, in which case there is a hole 28 equipped with a thread in the inner portion and correspondingly there is an opening 13 for the screw in the covering portion. The opening 13 extends to the edge of the covering portion so that the screw need not be unfastened altogether when the inner portion is placed inside the covering portion. At its proper fastening point, there is a recess for the screw-head in the opening 13, in which case it is no longer possible for the tightened screw to move along the opening. Thus a strong fastening is made between the inner portion and the covering portion. When the fastening screw is in the side of the inner and covering portion, it is also easy to access the fastening screw.

**[0017]** In figure 1b the inner portion 20 has been placed inside the surface portion. Then the adhesive sticker 25 at the bottom 26 of the inner portion remains visible. The adhesive sticker can be, for example, a layer of glue at the bottom of the inner portion with a protecting strip on top of it. When the protecting strip is removed from the adhesive sticker and the drying rack is placed at a desired mounting place on the wall, the inner portion will stick to the spot in question on the wall. When the tightening screw 29 has not yet been tightened, the drying rack can be detached, in which case the inner portions remain on the wall at their proper mounting spots. Thereafter, fastening holes can be drilled into the wall and the inner portions fastened to the wall with screws through the openings 27 in the inner portions. If there is not a hole ready in the adhesive sticker 25 at the place of the opening 27, it will emerge during the drilling/screwing.

**[0018]** Figures 3a-3c show a fastening arrangement of the drying rack according to the invention when an electric cable is directed via the fastening. Figures 4a and 4b show in more detail the inner portion used in the

arrangement. The drying rack shown by the figures is also in this case a ladder and there are fastening supports 32 in its vertical rods 31. At the end of the fastening support, there is a covering portion 34, the inside of which is sized to accommodate the inner portion 40.

**[0019]** The covering portion and the inner portion are fastened to each other with a screw 49, in which case there is a hole 48 equipped with a thread in the inner portion and correspondingly there is an opening 33 for the screw in the covering portion. The opening 33 extends to the edge of the covering portion so that the screw need not be unfastened altogether when the inner portion is placed inside the covering portion. At its proper fastening point, there is a recess for the screw-head in the opening 33, in which case it is no longer possible for the tightened screw to move along the opening.

**[0020]** In figures 3a and 3b, the electric cable 36 has been directed from the side of the covering portion and the inner portion. For this purpose, there is an opening 39 in the covering portion through which the cable and a through bushing fit. Correspondingly there is an opening 43 in the inner portion 40 for the cable. The opening 42 in the inner portion extends as far as the bottom 46 of the inner portion, in which case the cable can be directed also directly through the inner portion to the cable conduit in the wall. This kind of arrangement has been shown in figure 3c. Then an opening for the cable will be made also to the adhesive sticker at the mounting. Because of the cable opening 43 in the inner portion, the fastening hole 47 lies on the edge of the bottom of the inner portion. According to figure 4a, the fastening opening 47 can be also longitudinal, in which case the inner portion can be fastened into the wall in different positions. Thus one can choose in which direction one desires the cable to be directed on the surface of the wall structure.

**[0021]** The outer diameter of the inner portion shown in figures 4a and 4b can be, for example, 37 mm, and the thickness of the wall can be, for example, 1.5 mm. The width of the opening 43 can be, for example, 11 mm, and the dimensions of the opening 47 can be, for example, 6.6 x 20 mm. The hole 48 can have, for example, an M4 thread for the corresponding fastening screw.

**[0022]** Figure 5 shows a flowchart of a fastening method 50 of a drying rack according to the invention. For example, the method can be applied for fastening the drying racks shown in figures 1-4. In the first step 51, the inner portions are placed inside the covering portions of the fastening supports such that the adhesive stickers on the bottoms of the inner portions remain visible. Thereafter the protecting strips are detached from the adhesive stickers of the inner portions in step 52, in which case the glue of the adhesive sticker will become exposed. In step 53 the drying rack is placed at a desired mounting spot on the wall. Then the inner portions stick to the wall at their bottoms. Thereafter, in step 54 the drying rack is removed from the mounting spot, in which case the inner portions remain stuck on the wall at their adhesive surfaces. Through the fastening openings in the inner portions, holes will be drilled on the wall, step 55, possible plugs are placed in the holes, and the screws are tightened for fastening the inner portions onto the wall, step 56. It is also possible that the wall material allows the turning of the screws straight, without any drilling of holes. In step 57 the drying rack is placed back onto the wall such that the inner portions are located inside the covering portions. Finally, the inner portions and the covering portions are fastened to each other by tightening the correct fastening screws, step 58, after which the fastening of the drying rack has been completed.

**[0023]** The scope of the invention will be defined in the following claims. It will be clear to a person skilled in the art that the details of the different features of the invention may vary within the main inventive idea depending on each embodiment of the invention. Particularly the dimensions mentioned in the above description are exemplary, and it is clear that the dimensions can be changed to suit each embodiment.

**[0024]** It should also be noted that even though the mounting arrangement of the drying rack was presented as the most preferable embodiment, the arrangement according to the invention can naturally be applied also to the fastening of other devices onto a planar surface structure. Furthermore, it should be noted that the arrangement according to the invention can be used in all or only a part of the fastening points of the device, in which case, for example, the fastening point including the water connection can be made in some other way, taking into account the prerequisite for the best way to make the water connection.

## Claims

1. Arrangement for fastening a device (10) onto a planar surface structure, and this device comprises a fastening support (12) at the end of which there is a covering portion (14), **characterized in that** the arrangement comprises:

   - an inner portion (20) which can be placed inside the covering portion (14) at least partly and in which there is a first opening (27) for fastening the inner portion onto the surface structure, for example, with a screw;
   - fastening means (13, 28, 29) for fastening the inner portion and the covering portion to each other;
   - an adhesive sticker (25) on the surface of the inner portion for the attachment of the inner portion to the surface structure while the inner portion is being fastened onto the surface structure through the first opening.

2. Arrangement according to claim 1, **characterized in that** the inner portion comprises an opening for directing an electric cable from the device through

the inner portion to the conduit in the surface structure and/or to the side onto the surface of the surface structure.

3. Arrangement according to protective claim 1 or 2, **characterized in that** the covering portion is sized to cover the inner portion in its entirety.

4. Arrangement according to any of protective claims 1-3, **characterized in that** on the side of the covering portion there is an opening for directing the electric cable from inside the device onto the surface of the surface structure.

5. Arrangement according to any of claims 1-3, **characterized in that** said device is a drying rack, preferably a drying rack which is heated by means of circulating water or electricity.

6. Method (50) for fastening a device onto a planar surface structure, **characterized in that**:

- the inner portion is placed inside the covering portion of the fastening support (51);
- the adhesive surface of the inner portion is revealed (52);
- the device is placed at a desired mounting spot in the surface structure (53);
- the device is removed from the mounting spot while the inner portions remain in the surface structure (54);
- the inner portion is fastened onto the wall structure through a first opening in the inner portion (55, 56);
- the device is placed into the inner portion which has been fastened onto the wall structure (57), and
- the covering portion and the inner portion are fastened to each other (58).

7. Method according to claim 6, **characterized in that** the electric cable coming from the device is directed from inside the fastening support, through a second opening in the inner portion to the conduit in the wall structure or onto the surface of the wall structure.

8. Method according to claim 6 or 7, **characterized in that** an opening is made on the side of the surface portion of the fastening support for directing the electric cable from inside the fastening support to the surface of the surface structure.

9. Method according to any of claims 6-8, **characterized in that** the inner portion and the covering portion are fastened to each other at their side by a screw fastening.

10. Method according to any of claims 6-8, **characterized in that** the device to be fastened is a drying rack, preferably a drying rack which is heated by means of circulating water or electricity.

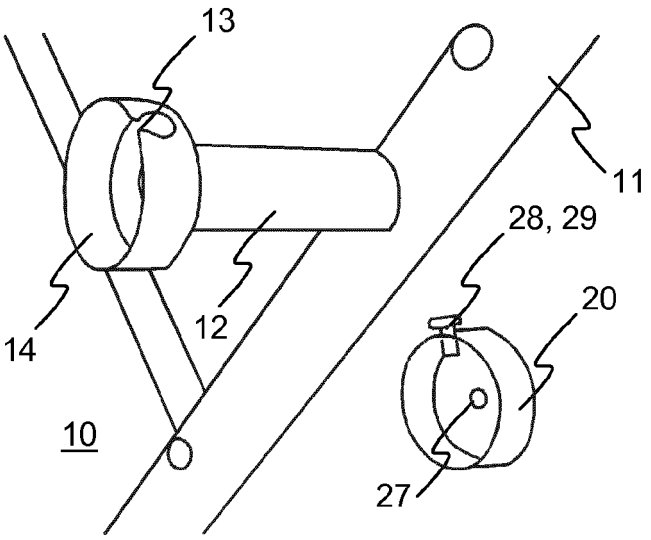


FIG. 1a

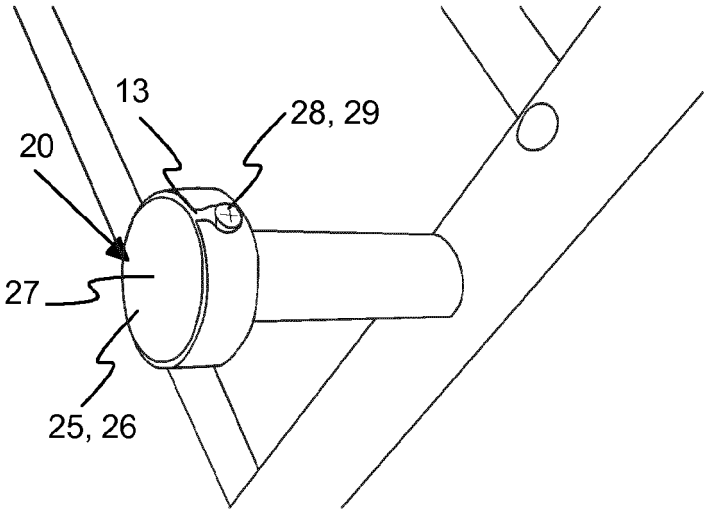


FIG. 1b

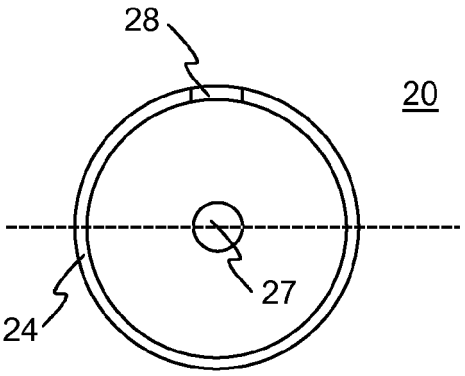


FIG. 2a

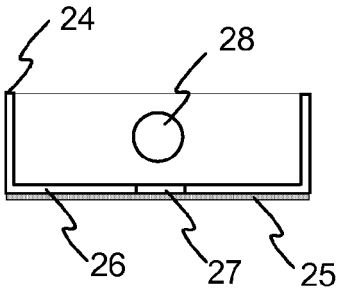


FIG. 2b

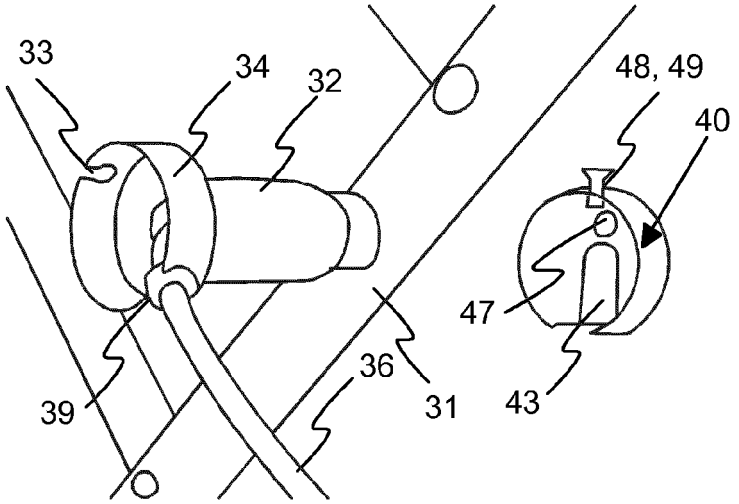


FIG. 3a

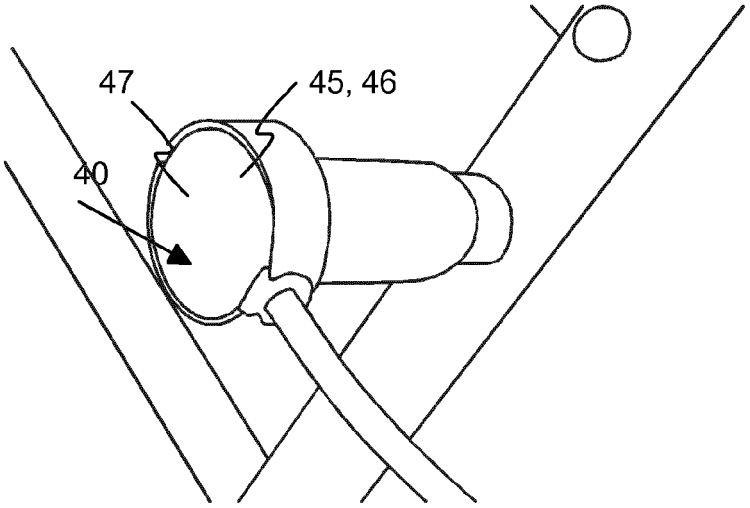


FIG. 3b

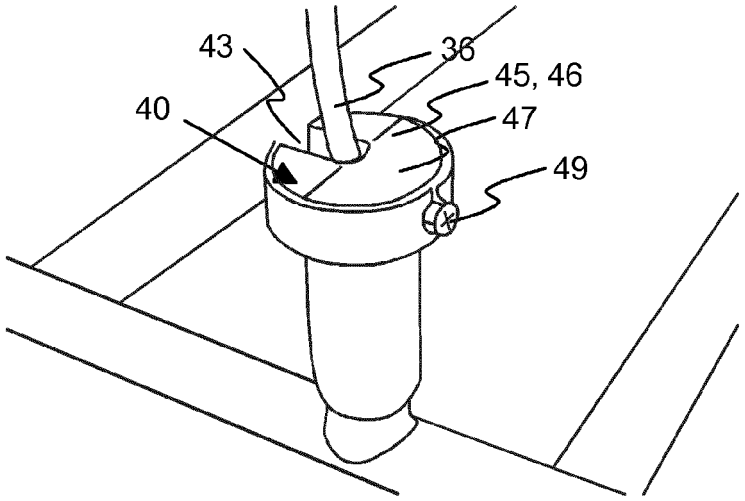


FIG. 3c

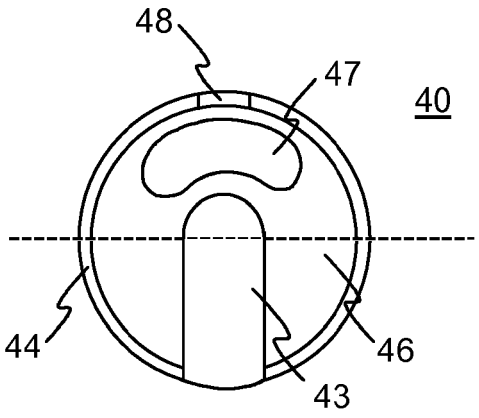


FIG. 4a

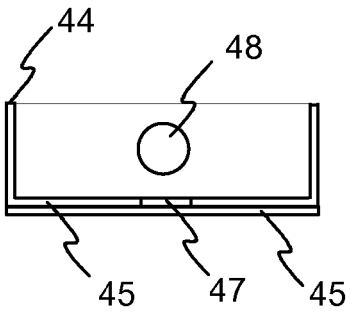


FIG. 4b

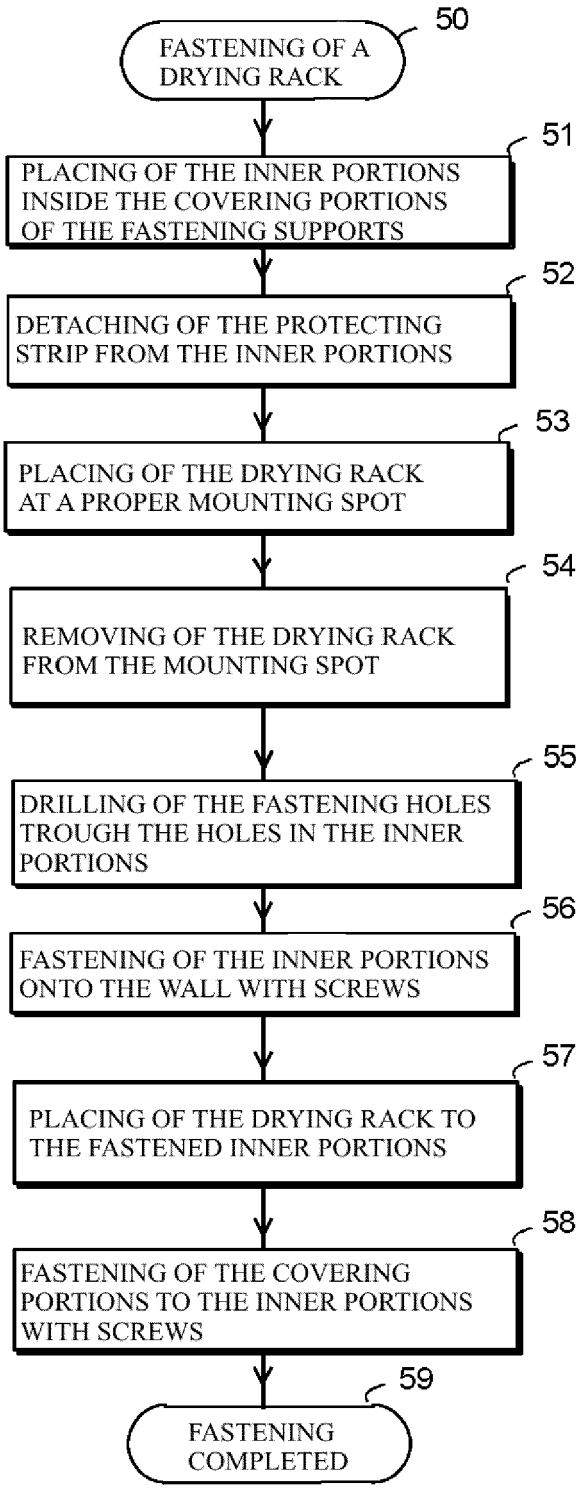
50
FASTENING OF A DRYING RACK
51
PLACING OF THE INNER PORTIONS INSIDE THE COVERING PORTIONS OF THE FASTENING SUPPORTS
52
DETACHING OF THE PROTECTING STRIP FROM THE INNER PORTIONS
53
PLACING OF THE DRYING RACK AT A PROPER MOUNTING SPOT
54
REMOVING OF THE DRYING RACK FROM THE MOUNTING SPOT
55
DRILLING OF THE FASTENING HOLES TROUGH THE HOLES IN THE INNER PORTIONS
56
FASTENING OF THE INNER PORTIONS ONTO THE WALL WITH SCREWS
57
PLACING OF THE DRYING RACK TO THE FASTENED INNER PORTIONS
58
FASTENING OF THE COVERING PORTIONS TO THE INNER PORTIONS WITH SCREWS
59
FASTENING COMPLETED

FIG. 5