



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
10.11.2010 Bulletin 2010/45

(51) Int Cl.:
E03F 5/04 (2006.01) **E04F 15/14** (2006.01)
E04B 1/66 (2006.01) **A47K 3/40** (2006.01)
A47K 3/00 (2006.01)

(21) Application number: **10156109.0**

(22) Date of filing: **10.03.2010**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
AL BA ME RS

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(30) Priority: **07.05.2009 NL 2002854**

(54) **Two-sided sheet attachment**

(57) The invention relates to a flexible layer, comprising an edge and a strip of flexible material extending parallel to the edge, which strip is arranged on the flexible layer at a distance from the edge and which strip has a

free edge extending substantially as far as the edge of the flexible layer such that a structure of Y-shaped cross-section is obtained.

The invention also relates to a drain.

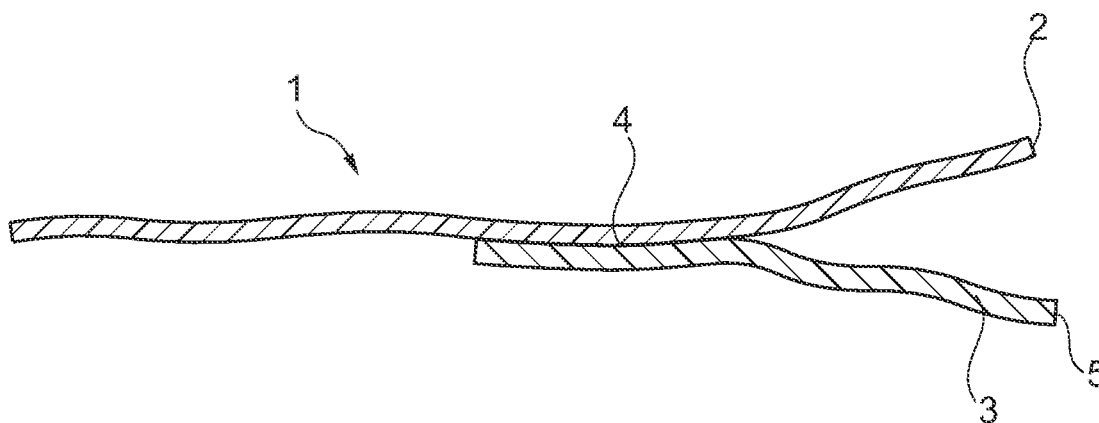


Fig. 1

Description

[0001] The invention relates to a flexible layer.

[0002] Flexible layers are applied in many variants. One of the applications is to bridge two rigid objects which can displace relative to each other. This displacement can be in the order of several centimetres or more, but also less, as occurs as a result of expansion and contraction of materials.

[0003] In such cases the flexible layer is often used to seal the space created by the displacement. It is therefore important that the flexible layer is properly secured to both objects.

[0004] In the case of drains, such as a shower drain, a flexible layer is used to retain a water seal between the drain and the floor, despite the movement which may occur between the drain and the floor as a result of the drain heating and cooling.

[0005] The forces exerted on such a flexible layer can be great, whereby it is essential for the layer to be properly fixed to both objects. Particularly in the case of drains a good fixing to the drain itself is not easy. One of the causes is that the fixing surface on the drain is limited. In the case of for instance elongate shower drains the height of the side wall, and thereby the fixing surface, can be limited to less than 2 centimetres.

[0006] Provided in some cases is a flange on which the flexible layer can be arranged. This flange however usually protrudes to a position under the finishing layer of the floor, such as for instance a tile layer. The setting of tiles is however impeded by this flange, since the usual tapping-in of the tiles is hindered by the flange. Efforts are therefore made in such cases to keep the flange as small as possible, which in turn has an adverse effect on the fixing of the flexible layer.

[0007] It is therefore an object of the invention to alleviate or even obviate the above stated drawbacks.

[0008] This object is achieved with a flexible layer according to the invention, comprising an edge and a strip of flexible material extending parallel to the edge, which strip is arranged on the flexible layer at a distance from the edge and which strip has a free edge extending substantially as far as the edge of the flexible layer such that a structure of Y-shaped cross-section is obtained.

[0009] With this Y-shaped structure the flexible layer can for instance be fixed to two sides of a flange, thereby doubling the fixing surface.

[0010] In a preferred embodiment of the invention the flexible layer is a sealing membrane. A sealing membrane is frequently used in the field of sanitary fittings, wherein the sealing membrane forms a watertight layer under a layer of tiles arranged on the sealing membrane.

[0011] The strip is preferably formed integrally with the flexible layer.

[0012] In yet another embodiment of the invention the flexible layer is provided with an adhesive layer for fixing to for instance the substrate. The flexible layer is preferably manufactured provided with a cover foil, which is

removed when the flexible layer is arranged on for instance the substrate or for instance when the strip is fixed to the flexible layer.

[0013] In yet another embodiment of the invention the cover foil is arranged on the adhesive layer in parts so that a desired part of the adhesive layer can be exposed. It is hereby possible to remove a first part of the cover foil in order to arrange the flexible layer on a flange of for instance a drain, a second part of the cover foil can then be removed in order to arrange the strip on the flexible layer and, finally, a third part of the cover foil can for instance be removed in order to arrange the whole of drain, flexible layer and strip on the substrate.

[0014] The flexible layer can be used to bridge transitions between rigid objects, such as for instance an expansion joint. In such a case a flange can be provided on either side of the joint, between which is arranged a flexible layer with a Y-shaped structure on either side.

[0015] The invention further comprises a drain comprising a tray with a bottom surface and upright walls arranged along the periphery of the bottom surface, wherein a flexible layer according to the invention is arranged on at least one of the walls.

[0016] A flexible layer according to the invention is particularly advantageous in a drain because a drain has relatively little fixing surface while a good water seal is nevertheless desired.

[0017] The edge of the flexible layer and the free edge of the strip are preferably each arranged on one of the bottom surface and the at least one upright wall. Owing to the Y-shaped structure the flexible layer can be easily arranged around a corner, such as between the bottom surface and the side wall.

[0018] In a preferred embodiment of the drain according to the invention a flange is arranged on the free edge of at least one upright wall and the edge of the flexible layer is arranged on one side of the flange, and the free edge of the strip is arranged on the other opposite side of the flange.

[0019] In the case of a drain with a flange the width can be halved by a flexible layer according to the invention.

[0020] In another preferred embodiment of the drain according to the invention at least two adjacent upright walls lie at an angle to each other and a first flexible layer is arranged on the free edge of the first upright wall, and a second flexible layer is arranged on the free edge of the second upright wall, this layer partially overlapping the first flexible layer such that an edge of the first flexible layer is received between the edge and the free edge of the strip of the second flexible layer.

[0021] In the case of a drain it is usual to provide a flexible cloth around the drain for good sealing. This cloth can be cut as one whole, although it is recommended to arrange four strips around the drain. This does however have the result that the strips overlap each other. With a flexible layer according to the invention an adjacent strip can be received in the Y-shaped structure, thereby cre-

ating a reliable and strong connection.

[0022] The legs of the Y-shaped structure are preferably arranged parallel to each other on a fixing surface. An example hereof is when the legs of the Y-shaped structure are arranged on either side of a flange. The flexible cloth hereby doubles in fixing surface and the forces exerted on the flexible cloth can be distributed over both legs.

[0023] The invention further comprises a method for arranging a flexible cloth according to the invention on a drain comprising a tray with a bottom surface and upright walls arranged along the periphery of the bottom surface, wherein a horizontal flange is arranged on at least one of the walls, the method comprising the steps of:

- providing a sheet of flexible cloth which is provided with an adhesive layer;
- placing the tray with the edges of the upright walls on the adhesive layer; and
- providing a strip of flexible cloth;
- arranging the strip of flexible cloth over the horizontal flange and a part of the sheet of flexible cloth such that a structure of Y-shaped cross-section is obtained.

[0024] Using this method a tray, such as an elongate shower drain, can be provided in efficient manner with a flexible cloth. This cloth can provide for a reliable seal between a tray and a surrounding floor.

[0025] An embodiment of the method according to the invention comprises the step of cutting out the part of the sheet of flexible cloth between the upright walls of the tray.

[0026] This cutting out can for instance take place using a suitable knife, a laser or a water jet.

[0027] In another embodiment of the method according to the invention the horizontal flange is arranged on the edge of an upright wall.

[0028] In another embodiment of the method according to the invention the horizontal flange is arranged on the upright wall at a distance from the edge. When the part is cut out, the remaining part of the sheet of flexible cloth sinks downward onto the horizontal flange. It is recommended here to cut from the centre toward the outer ends of the tray, whereby the remaining part comes to lie on the horizontal flange without creases.

[0029] These and other features of the invention are further elucidated with reference to the accompanying figures.

Figure 1 shows a cross-sectional view of an embodiment of a flexible layer according to the invention. Figure 2 shows a cross-sectional view of a drain according to the invention with a flexible layer according to figure 1.

Figure 3 shows a perspective view of a second embodiment of a drain according to the invention.

Figure 4 shows a cross-sectional view along the line

IV-IV in figure 3.

Figure 5 shows a third embodiment of a drain according to the invention.

Figure 6 shows a method according to the invention. Figure 7 shows a cross-sectional view of a fourth embodiment.

Figure 8 shows a fifth embodiment of the invention. Figure 9 shows a sixth embodiment of the invention. Figure 10 shows a seventh embodiment of a drain according to the invention in a first position.

Figure 11 shows the embodiment of figure 10 in a second position.

Figures 12A-12C show a first embodiment of the method according to the invention.

Figures 13A-13C show a second embodiment of the method according to the invention.

[0030] Figure 1 shows a view in longitudinal section of a flexible layer 1 according to the invention. This flexible layer 1 has an edge 2. A strip 3 of flexible material is arranged parallel to this edge 2. Strip 3 is arranged on flexible layer 1 at a distance from edge 2 via contact surface 4. The strip 3 itself also has a free edge 5 which extends substantially as far as edge 2 of flexible layer 1. A structure of Y-shaped cross-section is hereby obtained as shown in figure 1.

[0031] Figure 2 shows a drain 10 according to the invention. This drain 10 has a tray consisting of a bottom surface 11 and upright walls 12. A grating 13 is placed in tray 11, 12.

[0032] A flexible layer 1 according to figure 1 is also arranged on tray 11, 12. Edge 2 of flexible layer 1 is here arranged on upright wall 12, while the free edge 5 of strip 3 is arranged on bottom surface 11. A firm fixing of flexible layer 1 on tray 11, 12 is hereby obtained.

[0033] Figure 3 shows a perspective view of a second embodiment 15 of a drain according to the invention. This drain has an elongate tray consisting of a bottom surface 16, upright walls 17 and flanges 18 arranged on the free edges of upright walls 17.

[0034] A flexible layer 19 is arranged on the corresponding flange 18 on the short sides of tray 16, 17, 18. A flexible layer 1 according to the invention is arranged on the long sides of tray 16, 17, 18.

[0035] As will be apparent from figures 3 and 4, flexible layers 1 overlap flexible layers 19. Flexible layer 19 is here received together with flange 18 between free edge 2 and free edge 5 of strip 3.

[0036] A good sealing can hereby be obtained with a strip-like flexible layer in four parts around a drain.

[0037] In the case flanges 18 are bent so that a part is vertical, and when the drain is arranged against at least two walls, only a single flexible layer of Y-shaped construction can be arranged on the bent parts, and the flexible layer can thus be used for two or more sides without necessarily overlapping.

[0038] Figure 5 shows a preferred embodiment of flexible layer 30 according to the invention. The flexible layer

has an adhesive layer 31 on one side. A factory-supplied cover foil 32, 33, 34 is arranged on this adhesive layer 31.

[0039] When flexible layer 30 is now arranged on a flange 35, the part 32 of the cover foil is first removed. A part of adhesive layer 31 is hereby exposed so that flange 35 can be arranged thereon.

[0040] Once flexible layer 30 has been arranged on flange 35, a strip 36 is arranged over both flange 35 and flexible layer 30. A second part 33 of cover foil 30 is here then removed so that strip 36 can adhere to this part of adhesive layer 31.

[0041] Finally, the third part 34 of the cover foil can be removed for fixing of flexible layer 30 onto for instance a substrate.

[0042] Figure 6 shows an embodiment of a method for manufacturing a drain according to the invention. Drain 40 has a bottom surface 41 with upright walls 42 and a horizontal flange 43 on all sides of these walls.

[0043] According to the method a flexible layer 44 is placed on a table 45. This table is provided with a perforated surface 46. Air is extracted via these perforations so that flexible layer 44 is suctioned fixedly onto surface 46 and whereby flexible layer 44 is held flat and without folds.

[0044] A drain 41, 42, 43 is then placed in opening 47, after which a strip 48 is arranged over flange 43. This whole is finally pressed down by a cover 49. Using this cover 49 sufficient pressure can for instance be exerted on the assembly of flexible layer 44, drain 41, 42, 43 and strip 48. When an adhesive is used the fixing is hereby improved, or the two layers 44 and 48 can otherwise be fused by means of heating.

[0045] Figure 7 shows a fourth embodiment 50 of the drain according to the invention. Drain 50 has a bottom surface 51, upright walls 52 and horizontal flanges 53. A fixing plate 54 is arranged on one of the horizontal flanges 53 via a flexible layer 55 according to the invention. Using this fixing plate 54 and the hole 56 arranged therein the drain 50 can be secured firmly to a surrounding construction. Variations resulting from for instance expansion can be compensated by using flexible layer 55. It is thus usual to arrange an insulating plate under the concrete floor in which drain 50 is arranged. Gas can sometimes still be released from such insulating plates, whereby the thickness of the plate varies and the concrete floor lying thereon sinks downward.

[0046] When fixing plate 54 is arranged vertically against a wall and use is made of an insulating plate which becomes thinner in the course of time, the Y-shaped construction further ensures that the risk of the flexible layer being torn away from flange 53 is reduced.

[0047] The flexible transition between horizontal flange 53 and fixing plate 54 moreover provides for a sound reduction. The vibrations resulting for instance from water falling onto drain 50 cannot be transmitted to fixing plate 54. Because the vibrations remain limited to drain 50 itself, the associated sound production will be lower.

[0048] Figure 8 shows a fifth embodiment 60 of a drain according to the invention. In this drain 60 a mounting strip 61 is first attached to the substrate via a screw 62. Mounting strip 61 has a groove 63 into which the end of a second mounting strip 64 protrudes. Mounting strip 64 is fastened to for instance a wall by means of a second screw 65.

[0049] A drain 67 is fixed to second mounting strip 64 via a flexible layer 66 according to the invention.

[0050] Figure 9 shows a cross-sectional view of a drain 70 according to the invention. This drain 70 has a bottom surface 71 and upright walls 72. An outward protruding flange 73 is arranged on one upright wall 72. An inward protruding flange 74 is arranged on the other upright wall 72, this flange 74 having a downward hanging edge 75.

[0051] A flexible layer 76 according to the invention is arranged at the transition between upright wall 72 and inward protruding flange 74. Such an embodiment of drain 70 is suitable for arrangement in a flat floor as well as against a wall. When mounted in a flat floor, flexible layer 76 is arranged horizontally underneath a tile layer. When mounted against the wall, the tile layer of the wall is placed on inward protruding flange 74 and flexible layer 76 extends behind the tile layer.

[0052] Figures 10 and 11 show a seventh embodiment 80. This embodiment 80 also has a bottom surface 81, upright walls 82 and horizontal flanges 83. A flexible layer 84 is arranged on one of the horizontal flanges 83. A mounting plate 85 is arranged on the free end of flexible layer 84. Owing to the flexible connection by means of layer 84 the mounting plate 85 can be positioned both horizontally and vertically, as shown respectively in figure 10 and figure 11. For use in vertical position a filler block 86 can be used which is fixed to mounting plate 85 via a bolt 87 and supports against side wall 82 and bottom surface 81.

[0053] A sound reduction also takes place in this construction due to the flexible transition 84 between horizontal flange 83 and mounting plate 85.

[0054] The use of the flexible layer according to the invention around a flange in any case ensures that vibrations are transmitted less well to the concrete layer in which the drain is arranged. An additional insulating layer can optionally be arranged on the flanges.

[0055] Figures 12A-12C show a first embodiment of the method according to the invention. According to this method, a roll 90 of flexible cloth is provided. This roll 90 is partially unrolled so that a sheet 91 of the flexible cloth is provided on a flat substrate.

[0056] Flexible cloth 91 is provided with a central adhesive layer zone 101 which is protected on the roll by a foil (not shown). Present on either side of the central adhesive layer zone 101 are zones 102 which are provided with a web layer for good adhesion to for instance a cement layer. After removal of this foil a shower drain 92 is placed with horizontal flanges 93 on the adhesive layer of sheet 91.

[0057] A narrower roll 94 is then provided. A strip of

flexible cloth 95 is unrolled from this narrower roll 94. This strip of flexible cloth 95 is also provided with an adhesive layer. This strip 95 is cut to a suitable length and pieces 96, 97, 98, 99 are then adhered to sheet 91 overlapping with flanges 93 of shower tray 92, whereby a structure of Y-shaped cross-section is obtained.

[0058] Finally, the whole of shower tray 92, flexible sheet 91 and strips 96, 97, 98, 99 is turned over, after which central piece 100 is cut out of the sheet of flexible cloth 91. This cutting out of central piece 100 can take place in the factory, but can also be done on site. The piece then provides protection for shower drain 92 and is only cut out once shower drain 92 has been fully installed.

[0059] Figures 13A-13C show a second embodiment of the method according to the invention. This method is particularly suitable for a shower drain 110, wherein flanges 111 are arranged at a distance from the edges of side walls 112.

[0060] In this method the sheet of flexible cloth 113 is adhered with the adhesive layer to the upper edge of side walls 112. The central part is then cut out of flexible cloth 113 in longitudinal direction from the centre using a knife 114. The sheet of flexible cloth 113 can hereby sink downward onto horizontal flanges 111 (see figure 13B).

[0061] Finally, strips 115, 116 cut to size are adhered overlapping with flanges 111 to the sheet of flexible cloth 113 so that a Y-shaped structure is formed around flanges 111.

Claims

1. Flexible layer, comprising an edge and a strip of flexible material extending parallel to the edge, which strip is arranged on the flexible layer at a distance from the edge and which strip has a free edge extending substantially as far as the edge of the flexible layer such that a structure of Y-shaped cross-section is obtained.
2. Flexible layer as claimed in claim 1, wherein the flexible layer is a sealing membrane.
3. Flexible layer as claimed in claim 1 or 2, wherein the strip is formed integrally with the flexible layer.
4. Flexible layer as claimed in any of the foregoing claims, wherein the flexible layer is provided with an adhesive layer.
5. Flexible layer as claimed in claim 4, wherein a factory-supplied removable cover foil is arranged on the adhesive layer.
6. Flexible layer as claimed in claim 5, wherein the cover foil is arranged in separate parts.
7. Drain comprising a tray with a bottom surface and upright walls arranged along the periphery of the bottom surface, wherein a flexible layer as claimed in any of the claims 1-6 is arranged on at least one of the walls.
8. Drain as claimed in claim 7, wherein the edge of the flexible layer and the free edge of the strip are each arranged on one of the bottom surface and the at least one upright wall.
9. Drain as claimed in claim 7 or 8, wherein a flange is arranged on the free edge of at least one upright wall and wherein the edge of the flexible layer is arranged on one side of the flange, and the free edge of the strip is arranged on the other opposite side of the flange.
10. Drain as claimed in any of the claims 7-9, wherein at least two adjacent upright walls lie at an angle to each other and wherein a first flexible layer is arranged on the free edge of the first upright wall, and wherein a second flexible layer is arranged on the free edge of the second upright wall, this layer partially overlapping the first flexible layer such that an edge of the first flexible layer is received between the edge and the free edge of the strip of the second flexible layer.
11. Method for arranging a flexible cloth as claimed in any of the foregoing claims on a drain comprising a tray with a bottom surface and upright walls arranged along the periphery of the bottom surface, wherein a horizontal flange is arranged on at least one of the walls, the method comprising the steps of:
 - providing a sheet of flexible cloth which is provided with an adhesive layer;
 - placing the tray with the edges of the upright walls on the adhesive layer; and
 - providing a strip of flexible cloth;
 - arranging the strip of flexible cloth over the horizontal flange and a part of the sheet of flexible cloth such that a structure of Y-shaped cross-section is obtained.
12. Method as claimed in claim 11, comprising the step of cutting out the part of the sheet of flexible cloth between the upright walls of the tray.
13. Method as claimed in claim 11 or 12, wherein the horizontal flange is arranged on the edge of an upright wall.
14. Method as claimed in claim 11 or 12, wherein the horizontal flange is arranged on the upright wall at a distance from the edge.

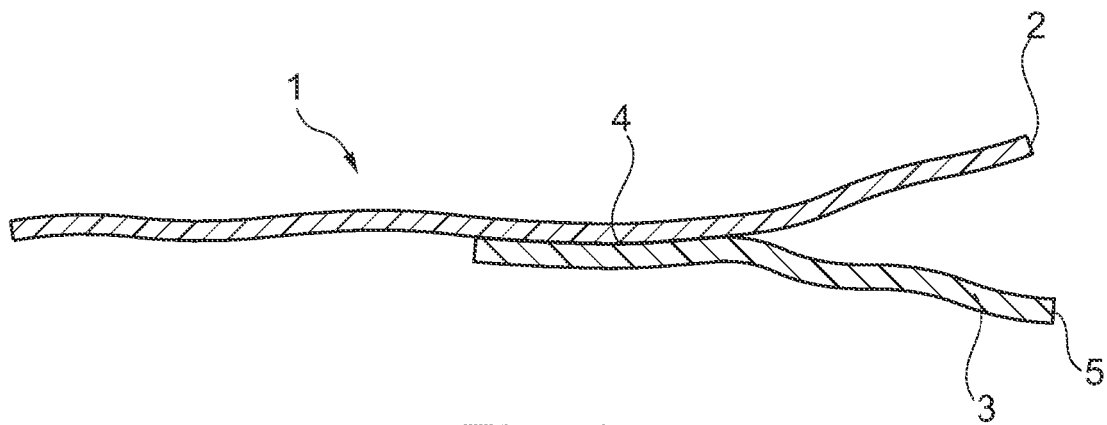


Fig. 1

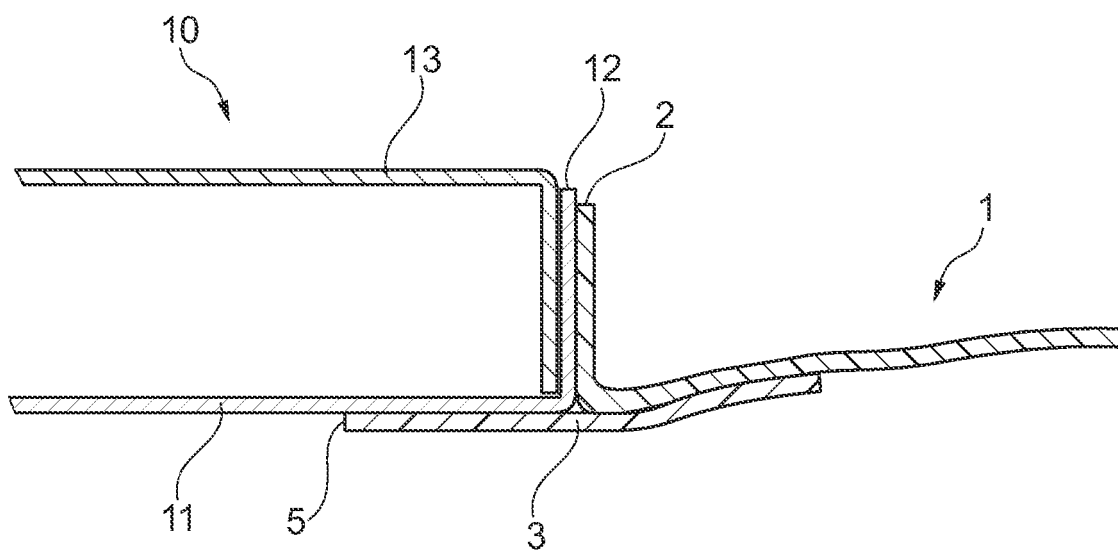


Fig. 2

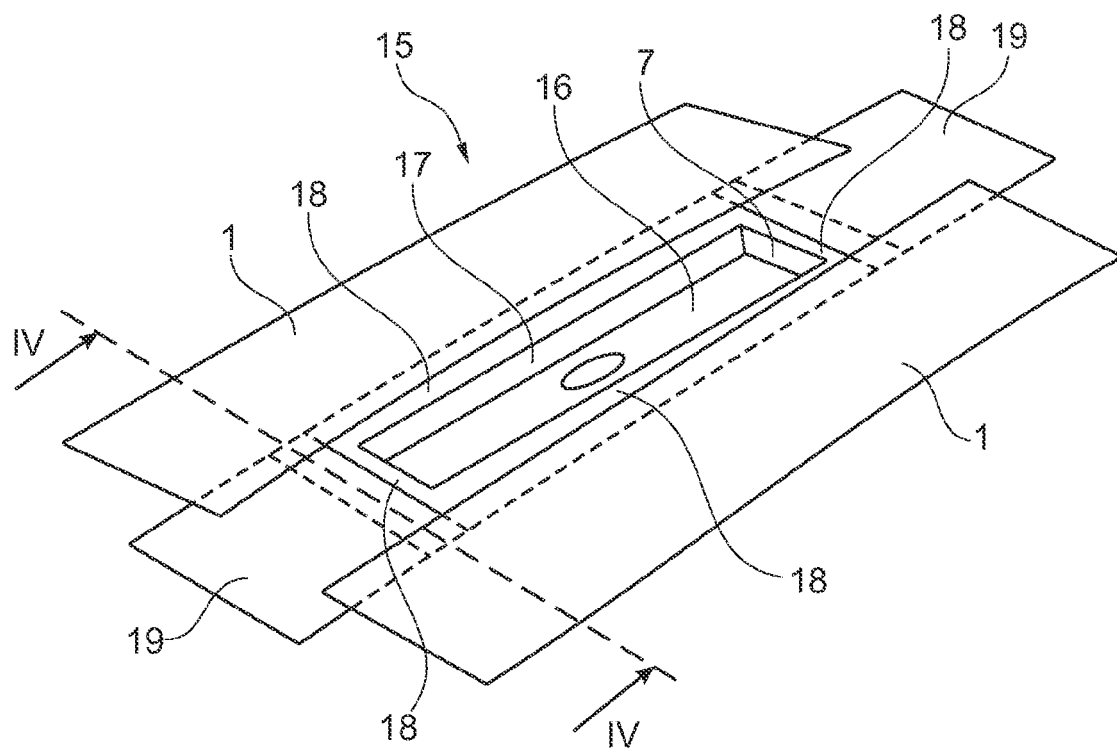


Fig. 3

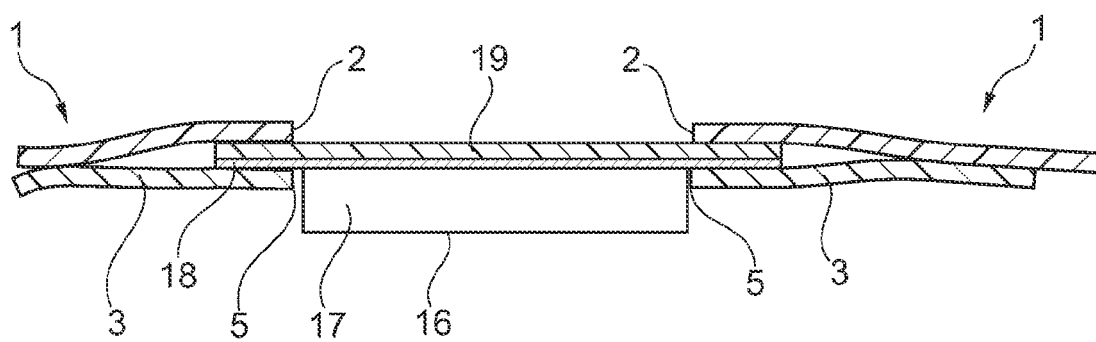


Fig. 4

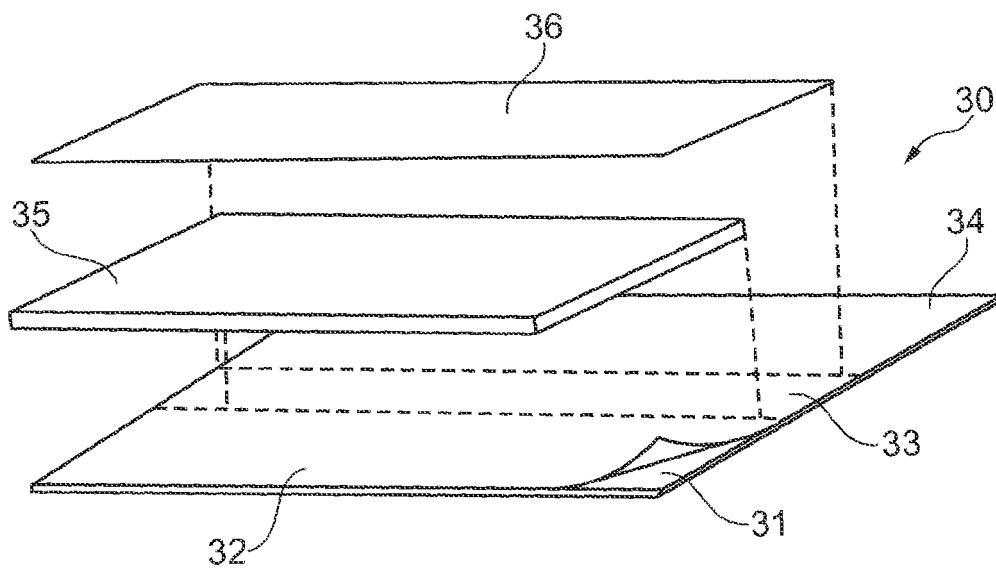


Fig. 5

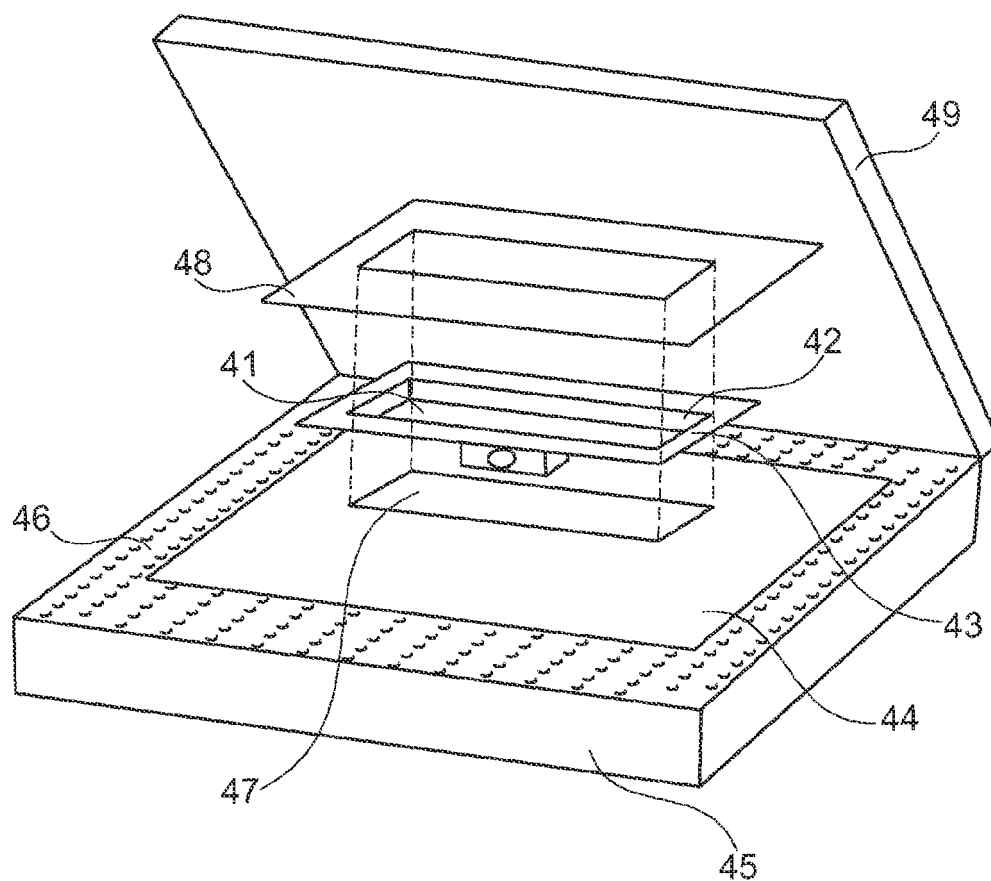


Fig. 6

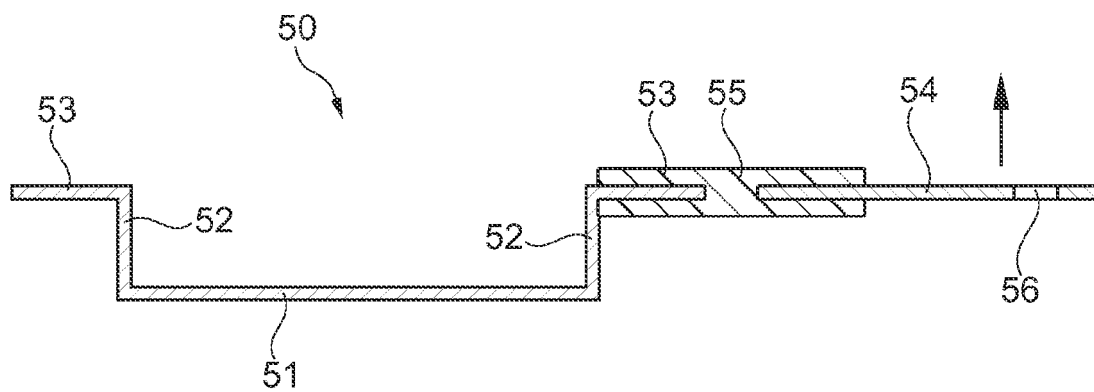


Fig. 7

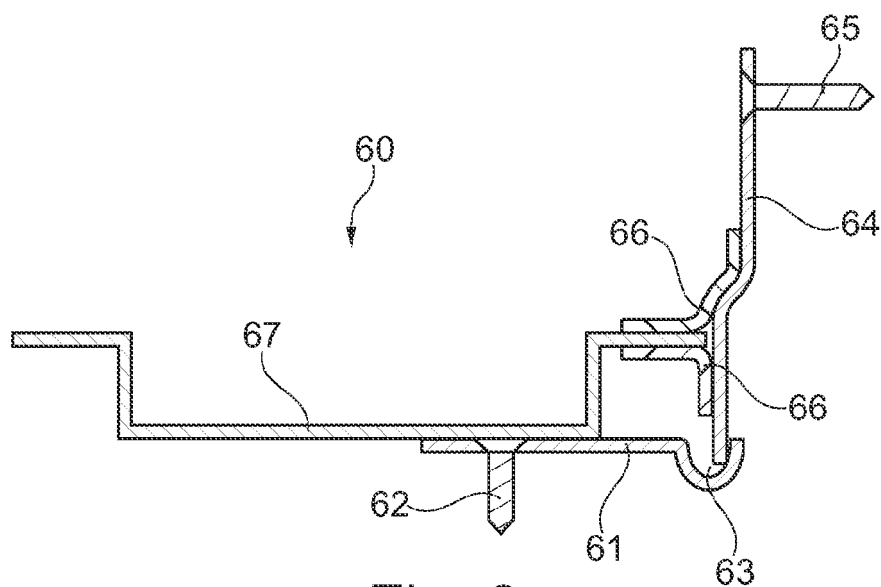


Fig. 8

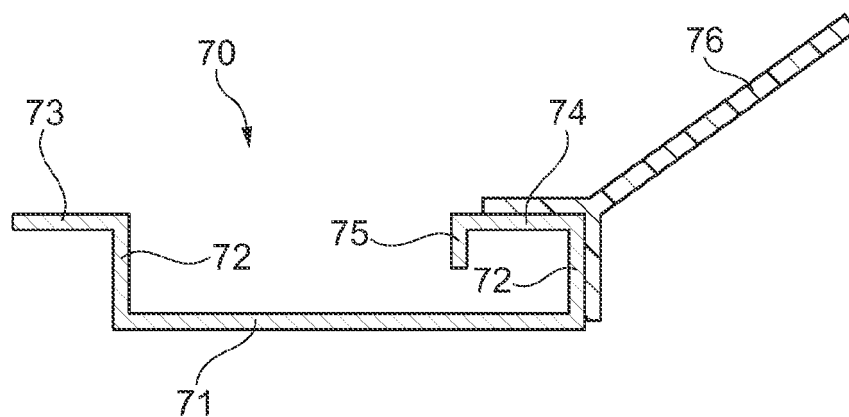


Fig. 9

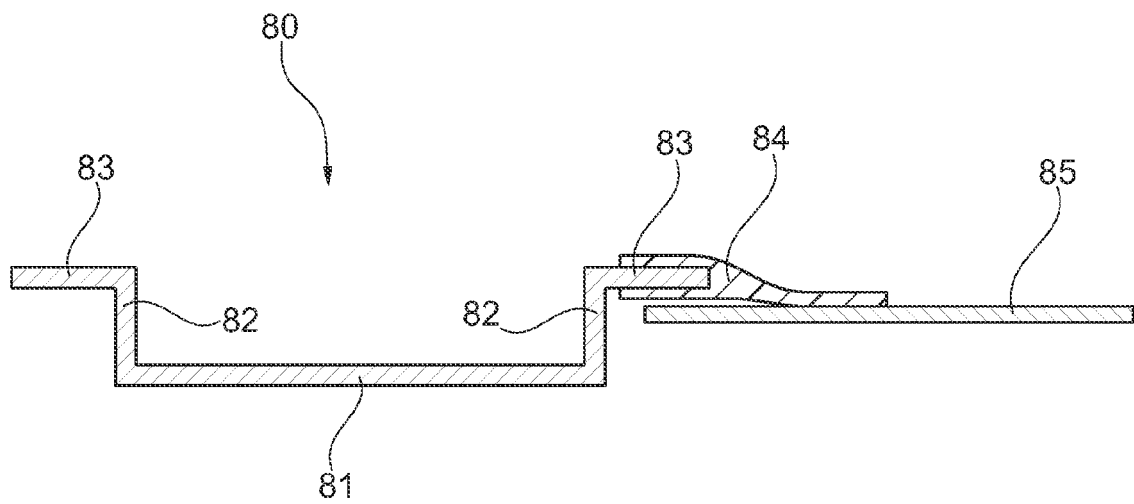


Fig. 10

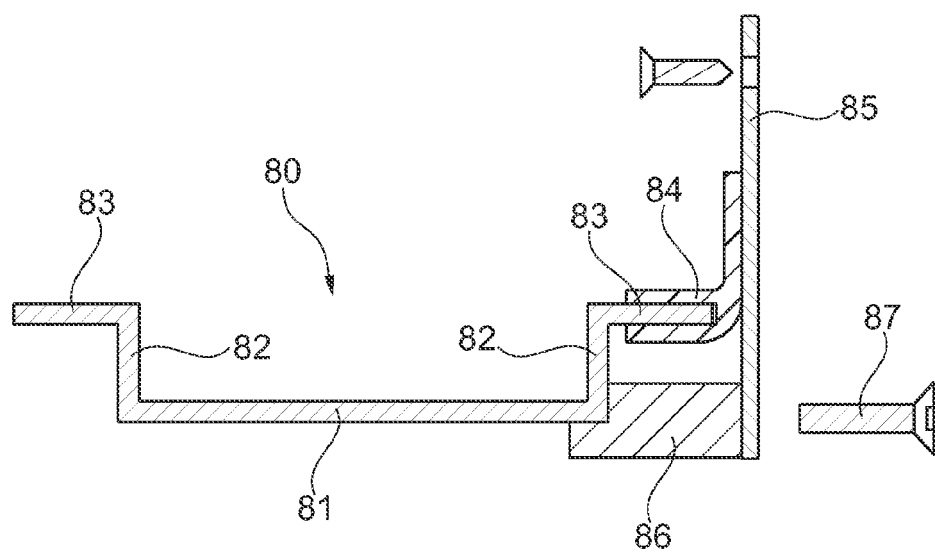


Fig. 11

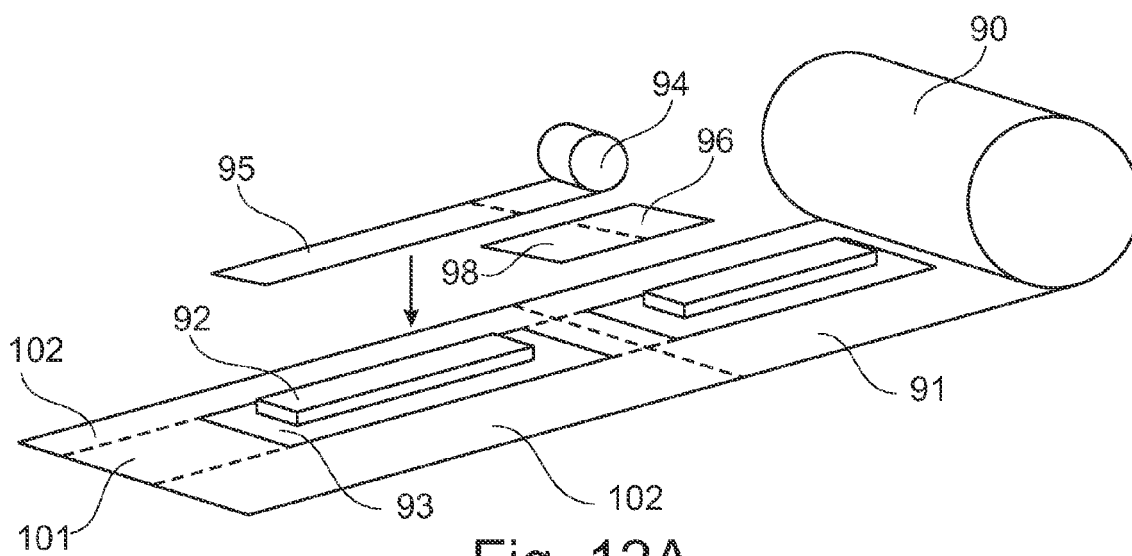


Fig. 12A

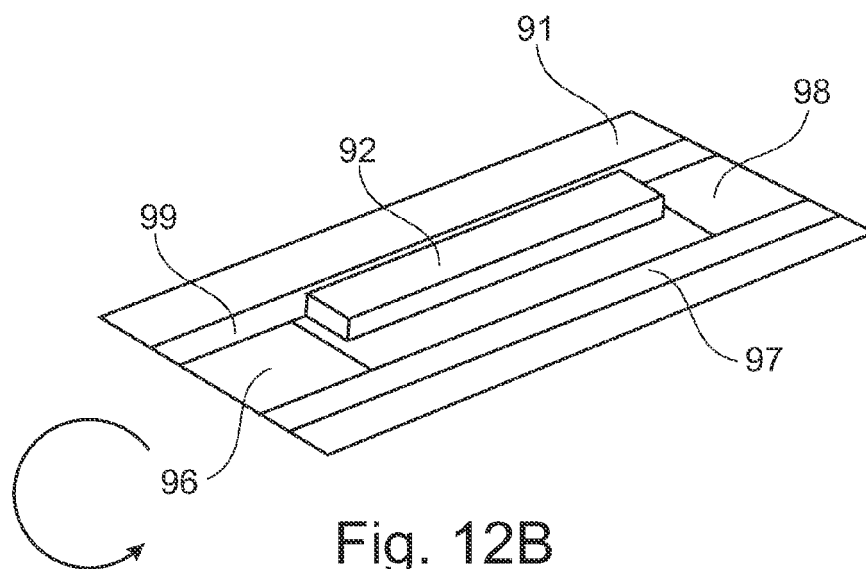


Fig. 12B

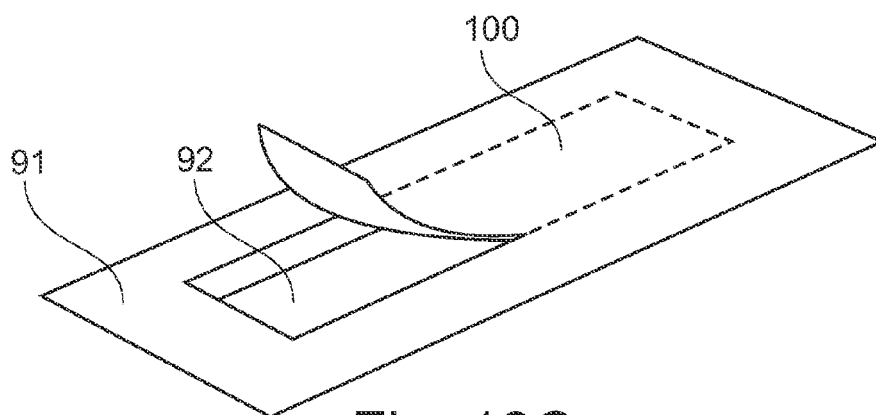
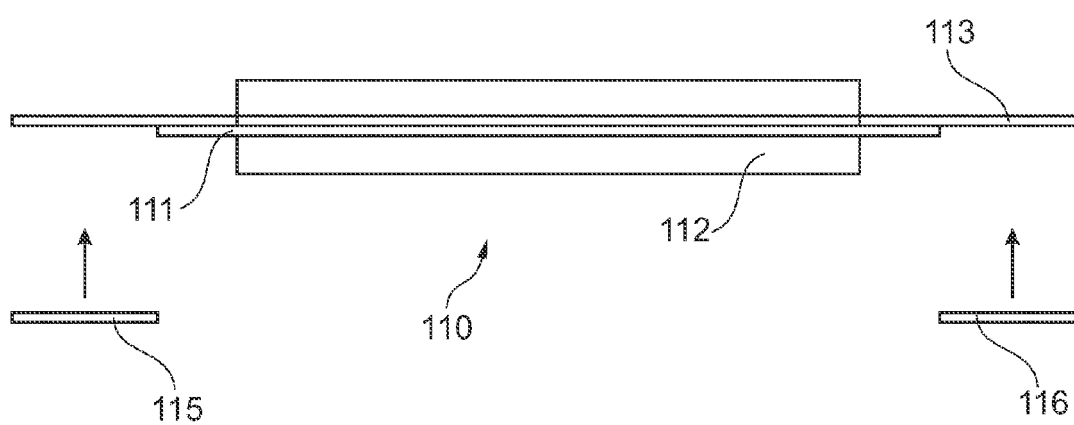
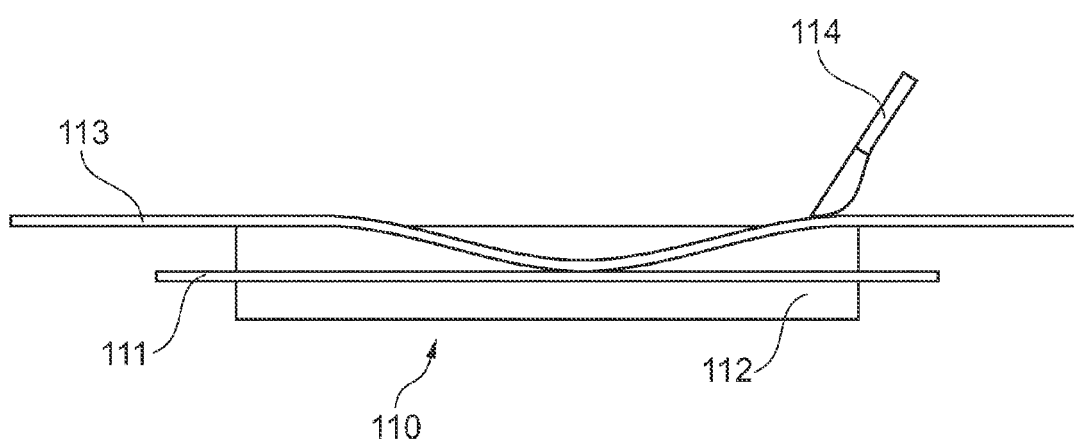
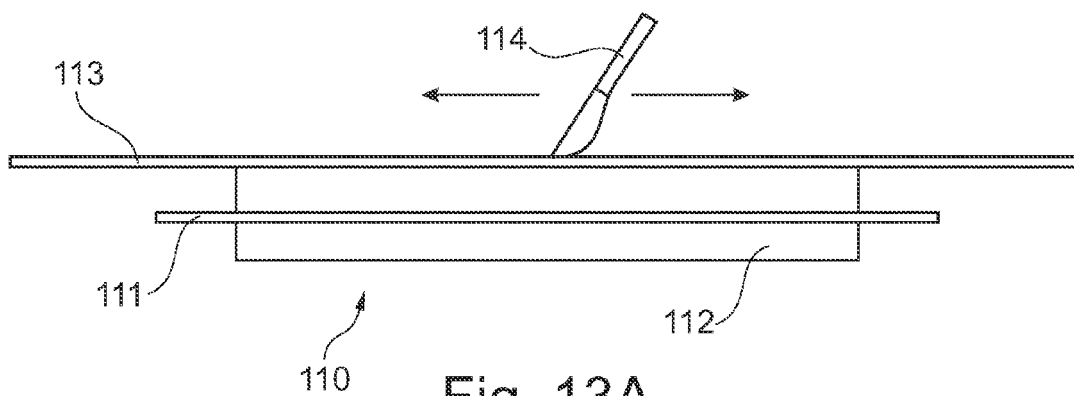


Fig. 12C





EUROPEAN SEARCH REPORT

Application Number
EP 10 15 6109

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Place of search The Hague		Date of completion of the search 28 July 2010	Examiner Van Bost, Sonia
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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