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(71) Applicant: **Per Sommerhein AB**
181 22 Lidingo (SE)

(72) Inventor: **Sommerhein, Per**
18144 Lidingö (SE)

(74) Representative: **Janson, Ronny**
Ehrner & Delmar Patentbyra AB,
Box 10316
100 55 Stockholm (SE)

(54) **Multi-purpose roof outlet**

(57) The invention concerns an outlet body (2) with a drain channel (7), the outlet body (2) being intended for a roof outlet (1) for a roof with a waterproof surface layer, the roof outlet (1) being of the type including:
- a covering member (3) connectable with the outlet body (2). The outlet body is distinguished in being a part of a modular construction, the outlet body (2) having a first interface portion (8) that is complementary and connectable to a second interface portion (9) of any of a plurality of different covering members (3) each being adapted to provide a seal with a different type of surface layer, so that the outlet body (2) can be used in conjunction with a plurality of different types of surface layers. The invention also concerns a covering member, a roof outlet and two methods for sealing a roof outlet (1) to a roof.

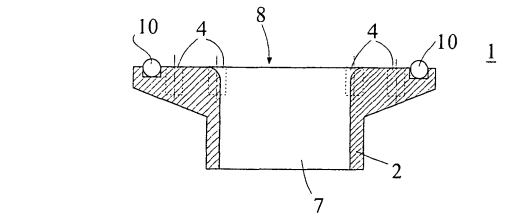
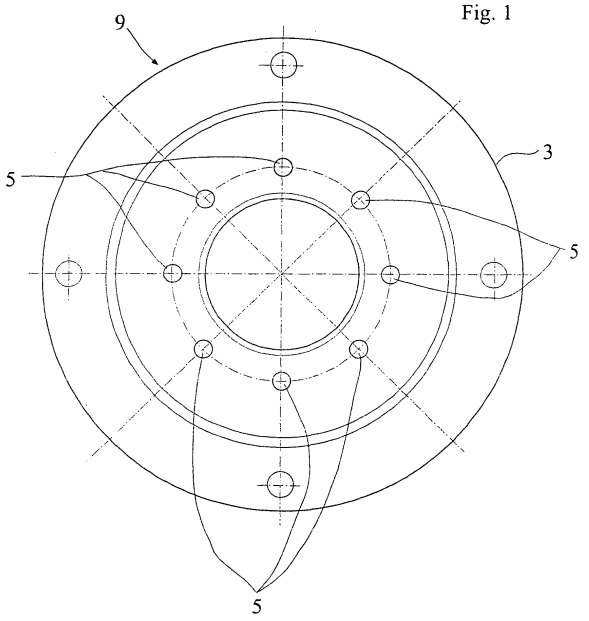


Fig. 1



EP 1 801 306 A2

Description

Field of the invention

[0001] The present invention concerns devices in conjunction with a roof outlet for the drainage of roofs, and more specifically devices according to the preambles of claim 1, claim 4 and claim 10. Further, it concerns methods according to the preambles of claims 11 and 13, respectively.

Prior art

[0002] In roof drainage, the roof outlets are vital details and must fulfil several requirements besides being able to convey the rainwater into the connected pipe work. One important requirement is that the roof outlets must secure watertight connections with the roof surface material, such as gutter soles or roof covering membranes. The roofing membranes may be elastomer, rubber fabric, bituminous felt or even mastic asphalt. All the membrane materials make heavy demand upon the roof outlet units which, due to the difference in membrane materials, call for special solutions, and hence, different types of roof outlets. An example of a prior art outlet can be found in the patent document US 5 882 043.

[0003] Today, such outlets are ordered from suppliers to meet the requirements of the specific type of roof drainage (gravity or siphonic), the connection to the pipe work and the type of surface layer. Often, after the roof outlets are ordered and supplied, the type of surface layer has not yet been decided. In many cases, the result of this policy is that roof outlets must be exchanged. The building industry is generally ordering roof outlets too late, which in turn may delay and increase cost for the project if relevant roof outlets are out of stock.

The object of the invention and its most important characteristics

[0004] It is an object of the present invention to propose a solution for or a reduction of the problems of prior art. A main object is consequently to propose an outlet that more flexibly can be used in the building process.

[0005] According to the invention, this is accomplished by devices of the types mentioned above with the characteristics that are revealed in the characterising portions of claims 1, 4, 10 and by methods according to claims 11 and 13, respectively.

[0006] The roof outlet is divided into an outlet body and a covering member and according to the invention constitutes a modular construction with an interface between said outlet body and covering member. The outlet body makes up one part of the modular construction and therefore has a first interface portion, which is complementary and connectable to a second interface portion of any of a plurality of different covering members. This first interface portion constitutes a defined physical structure and can for instance include at least one first fastening means connectable with corresponding at least one second fastening means of any of said plurality of different covering members. Each covering member is adapted to provide a seal with a different type of surface layer, so that the outlet body can be used in conjunction with a plurality of different types of surface layers. In this way, the roof outlet can be adapted to different surface layers simply by using different covering members.

[0007] The covering member is the complementary part of the outlet body of the modular roof outlet construction, said covering member having a second interface portion that is complementary and connectable to the first interface portion of the outlet body according to the invention. This second interface portion constitutes a defined physical structure and can for instance include at least one second fastening means connectable to the at least one first fastening means of said outlet body. The covering member is adapted to provide a seal with a specific surface layer. Thus, the covering member is chosen in accordance to the surface layer used and in this way, the roof outlet assembly can be adapted to different surface layers, simply by using the appropriate covering member.

[0008] Thus, the roof outlet according to the invention provides a modular construction, which is made possible by the outlet body and the covering member sharing a common interface, each of the outlet body and the covering member has an interface portion that is complementary to the interface portion of the other. These interface portions may include at least one fastening means connectable with each other, but can also include any structural adaptation, so as to permit the outlet body and the covering member to be connected. In this way a plurality of different covering members, all of them having such an interface portion, can be connected to the same outlet body. Since each covering member is adapted to provide a seal with a different type of surface layer, the same outlet body can be used in conjunction with a plurality of different types of surface layers.

[0009] The invention also comprises a method for sealing a roof outlet to a waterproof surface layer of a roof, the method including:

- obtaining a roof outlet body according to the invention,
- obtaining a roof outlet covering member according to the invention,
- installing the outlet body in the roof,
- sealingly connecting the outlet body with the surface layer by fastening the covering member to the outlet body.

[0010] An alternative method for sealing a roof outlet to a waterproof surface layer of a roof, according to the invention includes:

- obtaining a roof outlet body according to the inven-

tion,

- obtaining a roof outlet covering member according to the invention,
- connecting said outlet body with the covering member,
- installing the outlet body with the covering member in the roof,
- sealingly connecting the outlet body with the surface layer by fastening the surface layer to the covering member.

[0011] By means of these methods a way to sealingly connecting a roof outlet to a waterproof surface layer of a roof is achieved, wherein the roof outlet can be adapted to different surface layers.

Short description of the drawings

[0012] Embodiments exemplifying the invention will now be described, by means of the appended drawings, in which

fig. 1 illustrates a roof outlet according to the invention, consisting of an outlet body and a covering member,
fig. 2a illustrates an alternative embodiment of a sealing configuration for an outlet body, involving two o-rings,
fig. 2b illustrates another alternative embodiment of a sealing configuration for an outlet body, involving a plane seal,
fig. 3 illustrates an embodiment of a covering member, a pasting disc mounted on a outlet body,
fig. 4a illustrates an example of a pasting disc by itself, in a view from above,
fig. 4b illustrates an example of a pasting disc by itself, in a sectioned side view,
fig. 5 illustrates an embodiment of a covering member, an adaptation disc and a clamping ring, mounted on a outlet body,
fig. 6a illustrates an example of an adaptation disc by itself, in a view from above,
fig. 6b illustrates an example of an adaptation disc by itself, in a sectioned side view,
fig. 7a illustrates an example of a clamping ring by itself, in a view from above,
fig. 7b illustrates an example of a clamping ring by itself, in a sectioned side view, and
fig. 8 illustrates an outlet body mounted directly on a gutter sole.

Description of exemplary embodiments

[0013] To minimise the problems, and possibly reduce the numbers and types of outlets to be stocked, a multipurpose outlet is proposed. Such an outlet is depicted in figure 1. The outlet 1 comprises an outlet body 2 with a drain channel 7 and a covering member 3. The outlet body 2 can be combined with any of a number of different covering members 3 for different roof surface layers. The possibility of combining one outlet body with any of many different covering members arises from the provision of a common interface 8,9. This interface consists of an interface portion 8 of the outlet body that is complementary and connectable to an interface portion 9 of the covering member. The interface portions could for instance include fastening means 4,5, possibly a plurality of fastening means for each portion, which are arranged in a suitable configuration so that they can engage each other and therefore, any of the covering members can be attached to the same outlet body. In the figure, the fastening means are threaded holes 4 in the outlet body 2 and holes 5 in the covering member 3. To connect the covering member to the outlet body, the covering member is simply positioned on the outlet body with the holes aligned. Then, a suitable bolt (not shown) is positioned through the holes of the covering member and engaging the grooves of the holes of the outlet body. Any other suitable conventional fastening means can of course be used, such as rivets, nuts and bolts, snap lock devices, etc. Other structures can also contribute to the common interface 8,9, for instance grooves with mating protuberances.

[0014] In order to ensure a watertight connection between the outlet body and the covering member, it is possible to provide a sealing member 10. For instance, in figure 1, this sealing member is a conventional O-ring, possibly constituting the simplest and cheapest solution. However, this detail can be solved in various ways and with other types of conventional sealing means. In figure 2a two o-rings are shown and in fig. 2b a plane seal 10 is used. Even chemical sealing may be used. The sealing member could also have the function to galvanically isolate the covering member 2 from the outlet body 3. This would for instance be useful when the covering member and the outlet body are made from different metals, in order to prevent bimetallic corrosion.

[0015] Instead of providing the sealing means on the outlet body, as in figures 1 through 2, it is possible to attach it to the covering member (not shown). The attachment can be accomplished with any suitable means, such as the provisioning of physical structures onto which the sealing means can be fastened or even by gluing.

[0016] The covering member 3 of the invention is adapted to the surface material of interest. In figure 3, the covering member is a pasting disc 11 arranged to be connected with a surface layer by pasting. It is shown when mounted on the outlet body. In figure 4a, the example of a pasting disc is shown by itself and figure 4b is a side cross-section view of figure 4a. The pasting disc can for instance be used when the surface layer is bituminous felt. The felt is then fixed to the pasting disc. When mastic asphalt is utilised as a surface layer, the pasting disc is also employed.

[0017] In figure 5, the covering member consists of an adaptation disc 12 and a clamping ring 13. The adapta-

tion disc 12 has, besides the connection means for the outlet body, at least one additional connection means in the form of third connection means 6 connectable with the clamping ring 13, arranged so that the surface layer can be clamped between the adaptation disc 12 and the clamping ring 13. Figures 6a and 6b show the example of an adaptation disc in different elevations. In fig. 6b an example of the third connection means 6 can be studied. In this case they consist of bolts that have been attached to the adaptation disc. Other connection means 6 can of course be envisioned. Figures 7a and 7b shows an embodiment of the clamping ring 13.

[0018] Figure 8 shows another embodiment of the covering member 3. Here the covering member constitutes a part of the surface material as such and can for instance be a roof gutter. This is a rational and inexpensive solution.

[0019] Figures 3-8 illustrates examples of covering members that adapt to different surface layers. They may of course be modelled differently from those shown in the figures. Also, the invention may be used with other surface layers than those mentioned; the covering member may then require another design in order to adapt to that particular surface layer. The only requirement is that the common interface of the outlet body and the covering member, creating the modular concept of the invention, remains the same.

[0020] The solution of the different roofing membrane adaptors are known on the market, but only as integrated parts in the roof outlet designs. With the proposed solution, a variety of designs can be obtained, and combinations of different and suitable materials are possible.

[0021] Examples of materials for the outlet body 2 and the covering member 3 include metals, such as stainless steel and aluminium, synthetic materials, such as polyvinyl chloride and polyethylene in different combinations. Also the size and diameter of the roof outlet of the invention could of course be varied in accordance with the requirements.

[0022] The invention comprises a method for sealing a roof outlet to a waterproof surface layer of a roof, the method including:

- obtaining a roof outlet body 2 according to the invention,
- obtaining a roof outlet covering member 3 according to the invention,
- installing the outlet body 2 in the roof,
- sealingly connecting the outlet body 2 with the surface layer by fastening the covering member 3 to the outlet body 2. Optionally, the method could also include a step of obtaining a sealing member 10 and arranging it so as to provide a seal between the outlet body 2 and the covering member 3.

[0023] An alternative method, according to the invention, for sealing a roof outlet to a waterproof surface layer of a roof is also possible, namely:

- obtaining a roof outlet body 2 according to the invention,
- obtaining a roof outlet covering member 3 according to the invention,
- connecting said outlet body 2 with the covering member 3,
- installing the outlet body 2 with the covering member 3 in the roof,
- sealingly connecting the outlet body 2 with the surface layer by fastening the surface layer to the covering member 3.

[0024] The methods represent different procedures that are possible to attain a sealing between a roof outlet and a waterproof surface layer, according to the invention. By means of these methods, a way to sealingly connecting a roof outlet to a waterproof surface layer of a roof is achieved, wherein the roof outlet can be adapted to different surface layers. This ability of adaptation is due to using a roof outlet according to the invention, consisting of an outlet body and a covering member with a common interface, so that any of a plurality of covering members can be used. A covering member suitable for the specific type of surface layer is chosen.

[0025] The exact implementation of the different methods will depend on the specific surface layer chosen. For instance, when choosing bituminous felt as a surface layer, together with a pasting disc, the method of the invention would include pasting the bituminous felt onto the pasting disc. Instead, when using an adaptation disc and a clamping ring, the method of the invention would include clamping the surface layer in question between the adaptation disc and the clamping ring. Possibly, in this case some pasting could also be employed, for instance between the surface material and the adaptation disc and/or between the surface material and the clamping ring. For the case of the covering member constituting a part of the surface material as such, the outlet body is simply connected to the surface material. This can for instance be accomplished by imposing on said surface material the interface of the invention, such as the drilling of holes in a particular pattern, whereby the outlet body of the invention can be connected.

[0026] The surface layers are usually of organic material and hence, need to be replaced from time to time. The outlet design makes them easy to replace and easily allows a change to a surface layer requiring a different sealing connector.

Claims

1. An outlet body (2) with a drain channel (7), the outlet body (2) being intended for a roof outlet (1) for a roof with a waterproof surface layer, the roof outlet (1) being of the type including:

   - a covering member (3) connectable with the

outlet body (2), **characterised in** being a part of a modular construction, the outlet body (2) having a first interface portion (8) that is complementary and connectable to a second interface portion (9) of any of a plurality of different covering members (3) each being adapted to provide a seal with a different type of surface layer, so that the outlet body (2) can be used in conjunction with a plurality of different types of surface layers.

2. An outlet body (2) according to claim 1, **characterised in that** the first interface portion includes at least one first fastening means (4) connectable to corresponding at least one second fastening means (5) of a second interface portion (9) of any of said plurality of different covering members (3).

3. An outlet body (2) according to claim 1 or 2, **characterised in that** it includes a sealing member (10), arranged to provide a seal between the outlet body (2) and the covering member (3).

4. A covering member (3) for a roof outlet (1) for a roof with a waterproof surface layer, the roof outlet (1) being of the type including:

- an outlet body (2) having a drain channel (7) and being connectable with the covering member (3), **characterised in** being a part of a modular construction, the covering member (3) having a second interface portion (9) that is complementary and connectable to a first interface portion (8) of the outlet body (2) according to any of claims 1-3, the covering member (3) being adapted to provide a seal with a surface layer from a plurality of different surface layers.

5. A covering member (3) according to claim 4, **characterised in that** the second interface portion includes at least one second fastening means (4) connectable to corresponding at least one first fastening means (5) of a first interface portion (9) of the outlet body (2).

6. A covering member (3) according to claim 4 or 5, **characterised in that** it includes a sealing member (10), arranged to provide a seal between the outlet body (2) and the covering member (3).

7. A covering member (3) according to any of claims 4-6,
characterised in that it is a pasting disc (11) arranged to be connected with the surface layer by pasting.

8. A covering member (3) according to any of claims 4-6,
characterised in that it comprises an adaptation disc (12) and a clamping ring (13), whereby the adaptation disc (12) has at least one third connection means (6) connectable with the clamping ring (13), arranged so that the surface layer can be clamped between the adaptation disc (12) and the clamping ring (13).

9. A covering member (3) according to any of claims 4-6,
characterised in that it constitutes a part of the surface material as such.

10. Roof outlet (1) for a roof with a waterproof surface layer including:

- an outlet body (2) with a drain channel (7), and
- a covering member (3),
the covering member (3) being connectable to said outlet body (2),

characterised in a modular construction made possible by the outlet body (2) and the covering member (3) sharing a common interface, each having an interface portion (8,9) that is complementary and connectable to the other, whereby the outlet body (2) is an outlet body (2) according to any of claims 1-3, the covering member (3) is a covering member (3) according to any of claims 4-9 and thus can be chosen from a plurality of different covering members (3) each adapted to provide a seal with a different type of surface layer, so that the roof outlet (1) can be used in conjunction with a plurality of different surface layers.

11. Method for sealing a roof outlet (1) to a waterproof surface layer of a roof, the method including:

- obtaining a roof outlet body (2), having a drain channel (7),
- obtaining a roof outlet covering member (3), connectable to said outlet body (2),
- installing the outlet body (2) in the roof,
- sealingly connecting the outlet body (2) with the surface layer by fastening the covering member (3) to the outlet body (2), **characterised by**:
- in the step for obtaining the outlet body (2), obtaining an outlet body (2) according to any of claims 1-3,
- in the step for obtaining the covering member (3), obtaining a covering member (3) according to any of claims 4-9.

12. Method according to claim 11, **characterised by**:

- obtaining a sealing member (10) and arranging it so as to provide a seal between the outlet body (2) and the covering member (3).

13. Method for sealing a roof outlet (1) to a waterproof surface layer of a roof, the method including:

- obtaining a roof outlet body (2), having a drain channel (7),
- obtaining a roof outlet covering member (3), connectable to said outlet body (2),
- connecting said outlet body (2) with the covering member (3),
- installing the outlet body (2) with the covering member 3 in the roof,
- sealingly connecting the outlet body (2) with the surface layer by fastening the surface layer to the covering member (3), **characterised by**:

  - in the step for obtaining the outlet body (2), obtaining an outlet body (2) according to any of claims 1-3,
  - in the step for obtaining the covering member (3), obtaining a covering member (3) according to any of claims 4-9.

14. Method according to claim 13, **characterised by**:

- obtaining a sealing member (10) and arranging it so as to provide a seal between the outlet body (2) and the covering member (3).

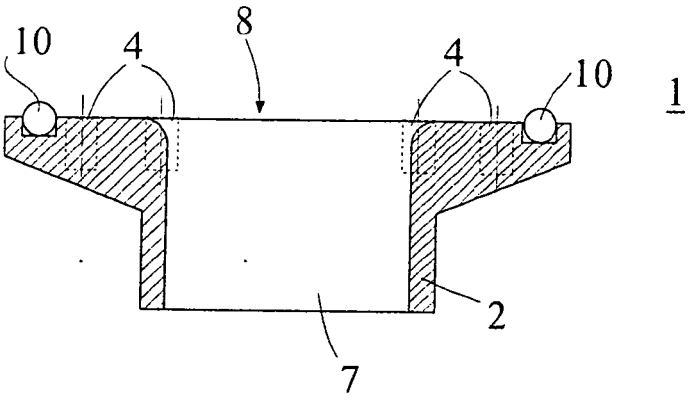
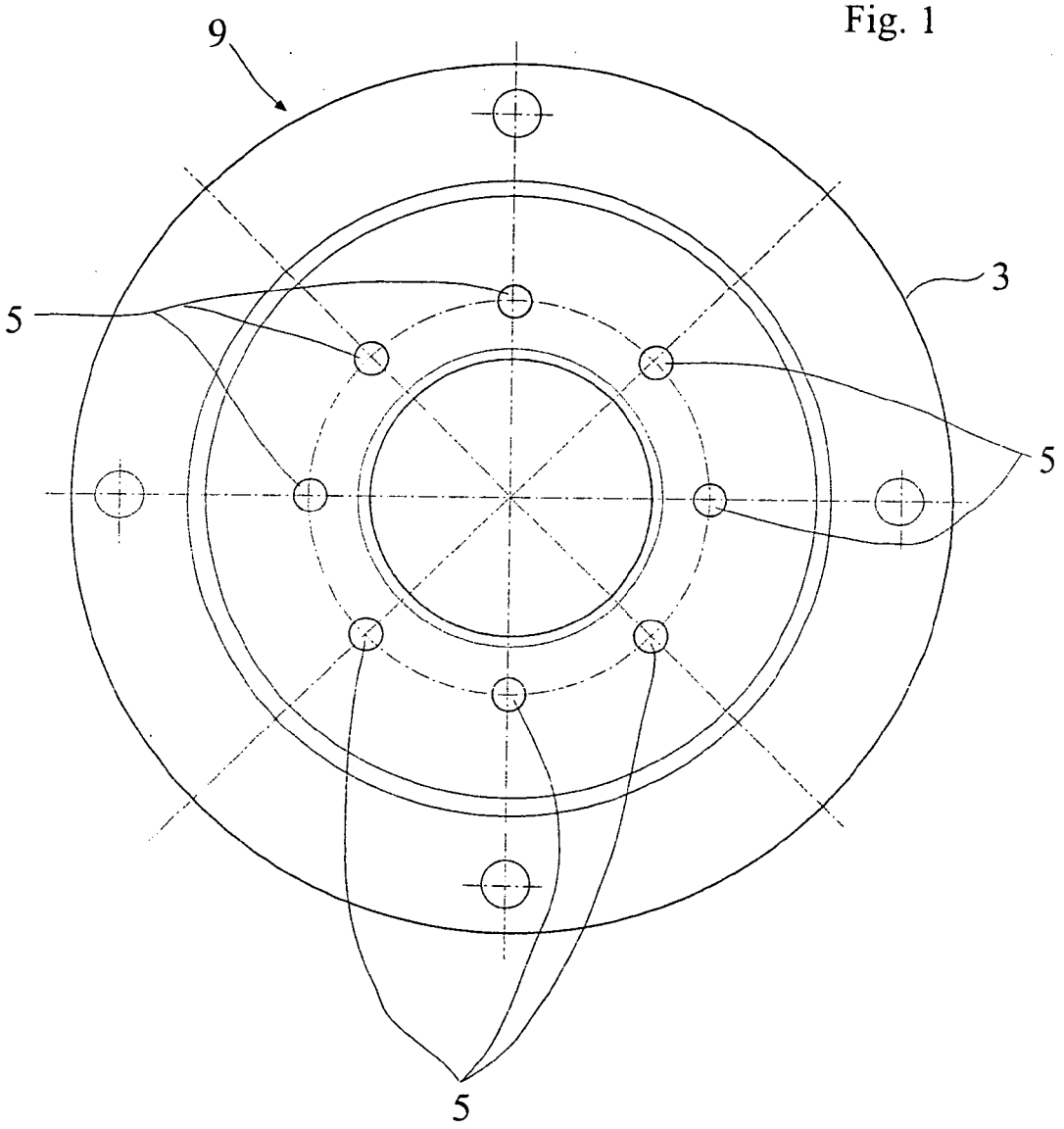


Fig. 1



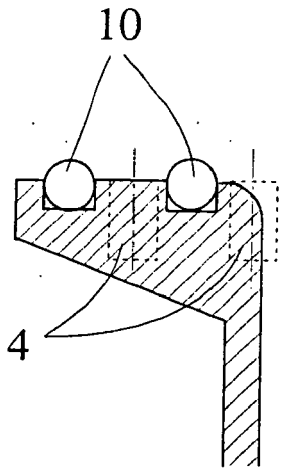


Fig. 2a

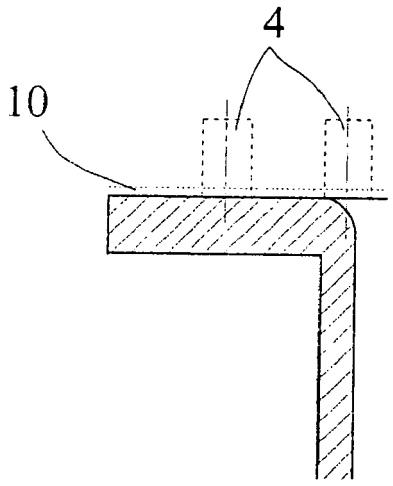


Fig. 2b

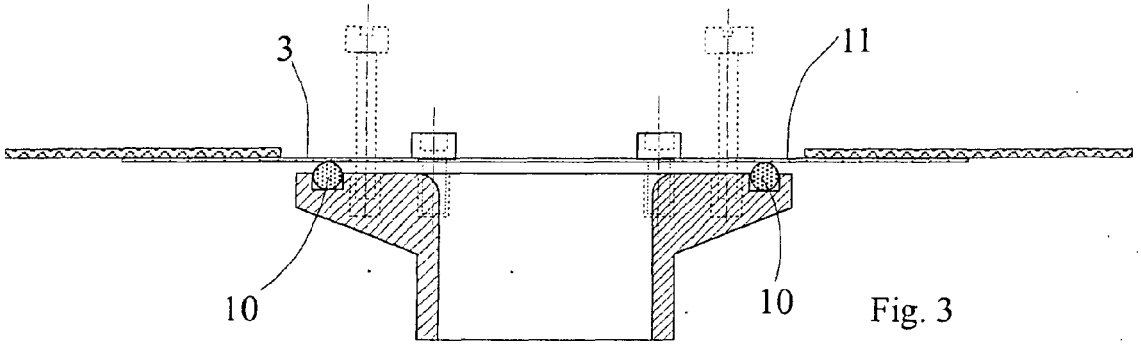


Fig. 3

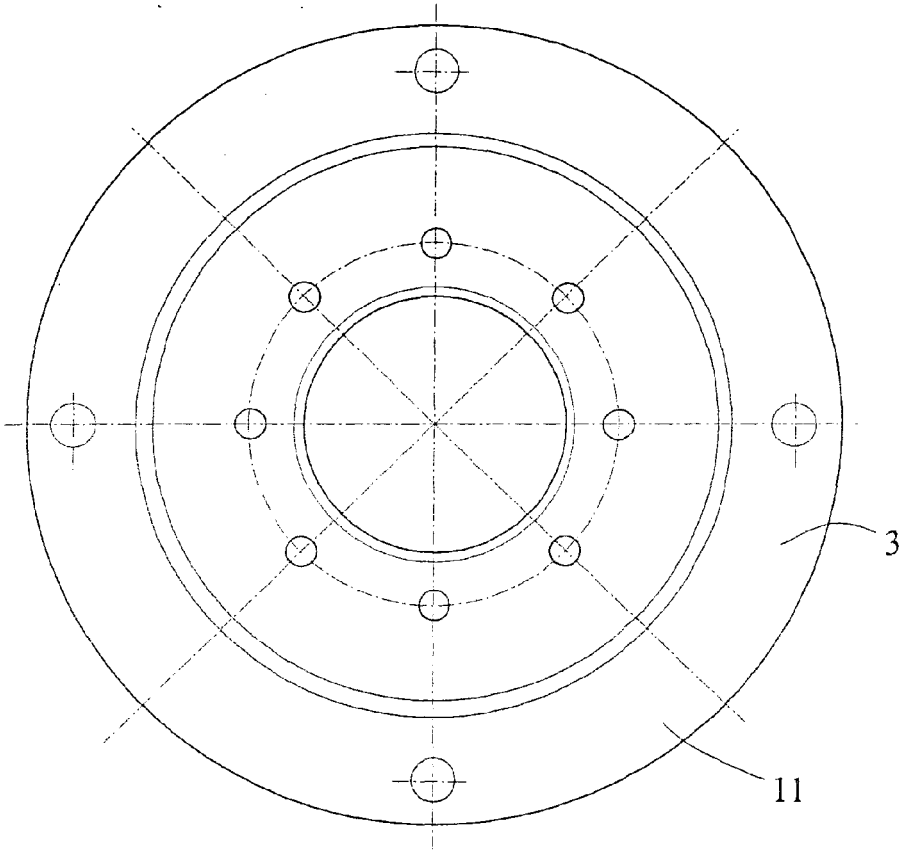


Fig. 4a

Fig. 4b

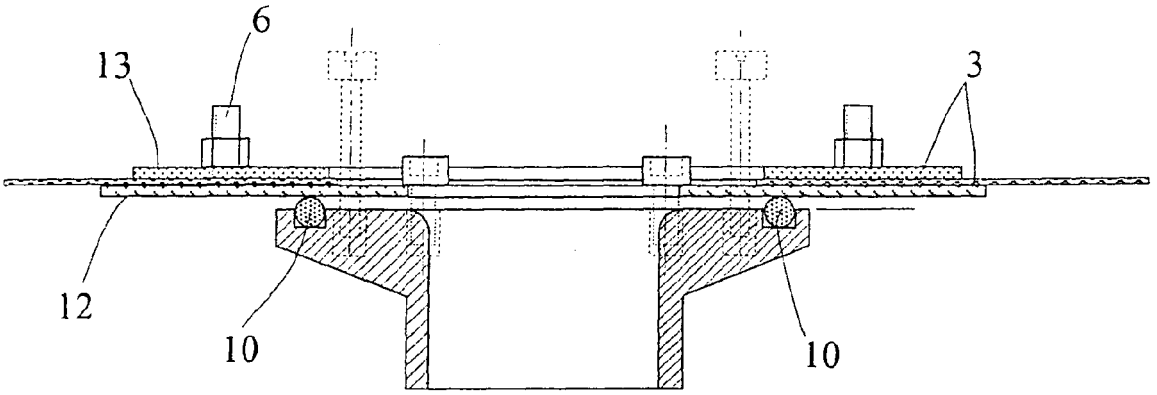


Fig. 5

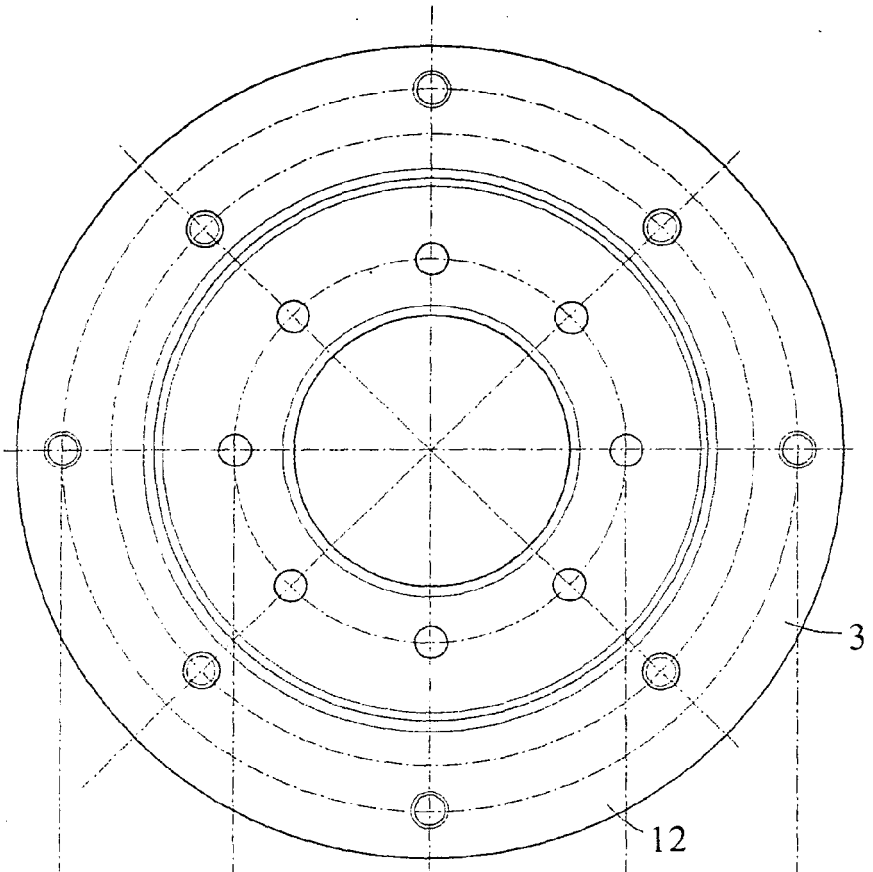


Fig. 6a

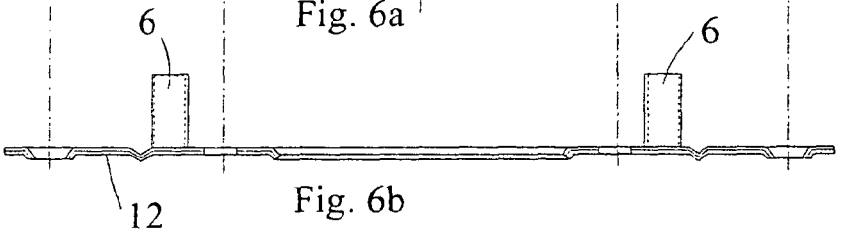


Fig. 6b

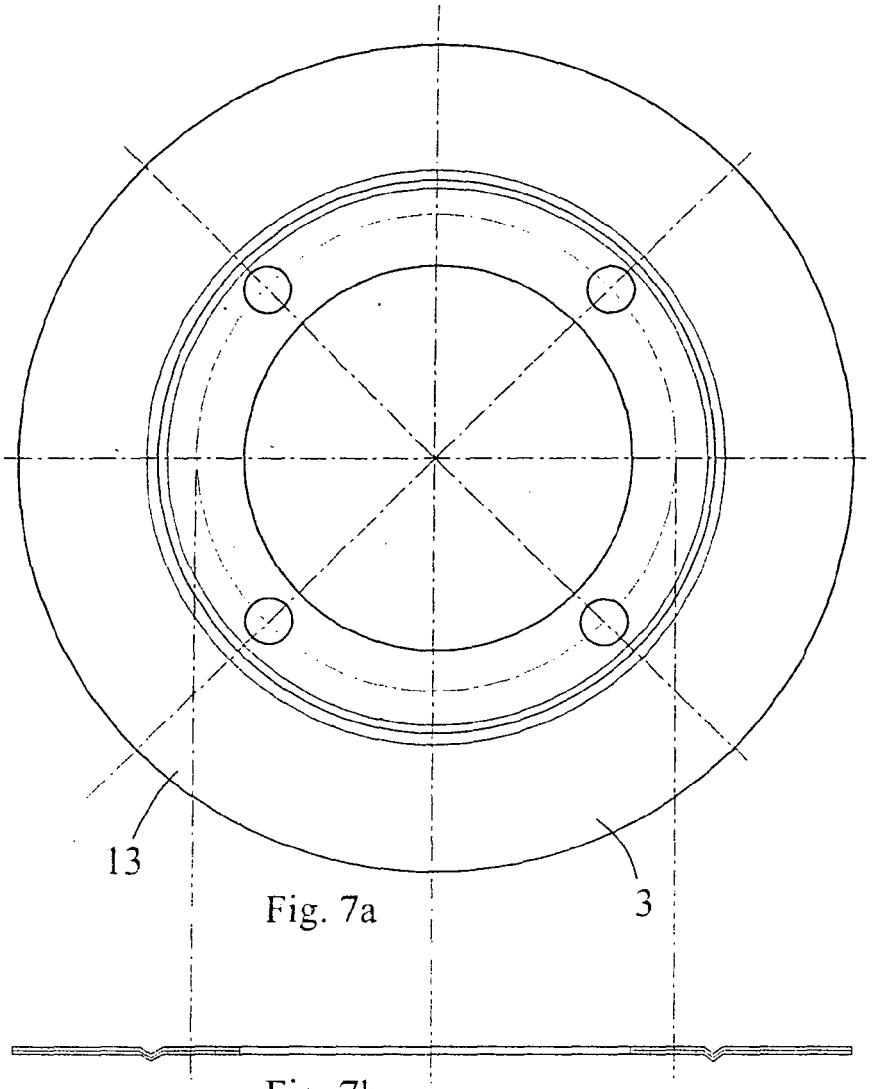


Fig. 7a

Fig. 7b

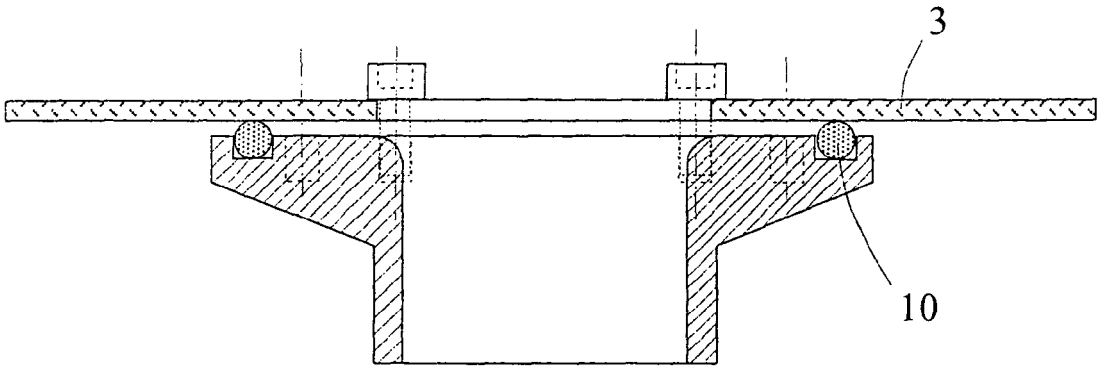


Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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