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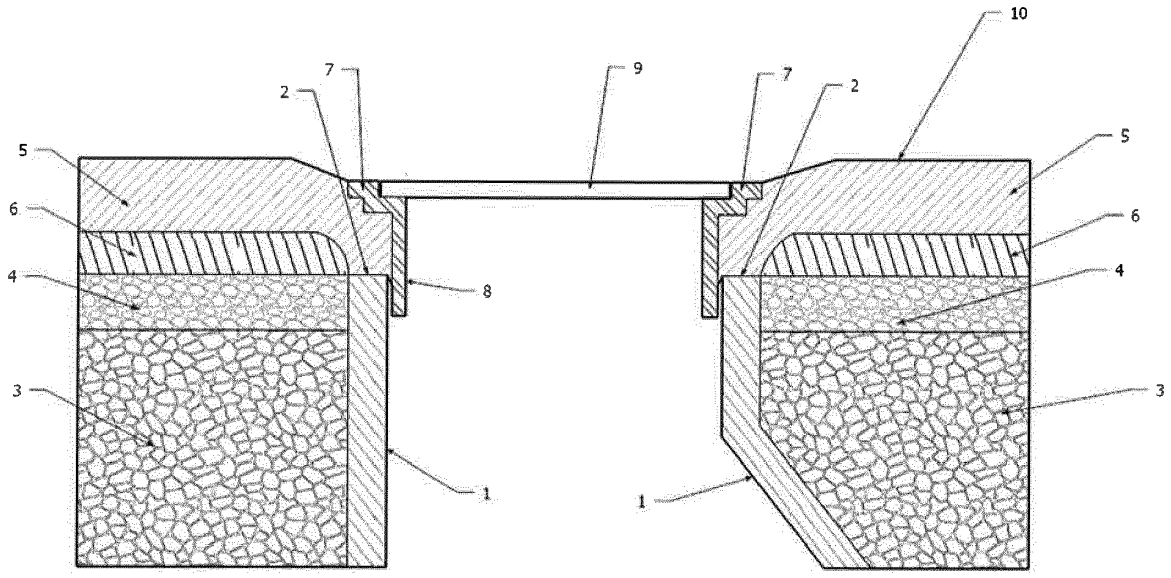
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(54) **A METHOD FOR INSTALLING A MANHOLE**

(57) A method is described for installing or renovating a basin in relation to a surface, wherein the basin includes at least a basin body (1) with top (2), frame (7) and cover (9), the method including lifting the basin frame from the basin body into a first position,
then placing a formwork ring (11) around the basin top (2), lowering the basin frame into a second position wherein the frame is aligned on a level with said surface, the basin frame running through said formwork ring and into the basin body,
injecting a casting mixture into a cavity formed between the surrounding ground and the basin frame.

Figure 1



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Description

[0001] The expression basin includes ordinary basins for water, sewage and cables, as well as other shafts for servicing buried functions, and in particular basins that are arranged in a street, road or square, the location being covered by asphalt, concrete or pavement slabs. A basin often includes a concrete basin body which is buried in the ground and connected to pipes or tunnels. Onto the top of the basin there is ordinarily placed a basin frame holding the cover. The basin frame is made from cast iron and the frame or road is adapted to provide the top of the frame being on a level with the road. When establishing new roads, there may occur settlements in the road, the masses collapsing. The surface of the road may also elevate during winter due to frost in the upper layer, while the basin will stay put as it penetrates into the frost free subsurface. This will create a height difference between road and basin, and will also break up the asphalt bordering the basin. The elevation of the basin must also be adjusted when the road is renewed with asphalt, e.g. by changing the basin frame or by adding shim-rings. There also exists basins wherein the basin frame protrudes into the underlying basin body, and thus may slide up and down into the basin in step with the road (floating basin frame).

[0002] In EP 2 128 344 there is disclosed a method of renovating a basin when new asphalt is added around the basin. The method includes lifting the basin frame from the top of the basin body, and cleaning the frame of rust and old asphalt. Then, a compressible gasket is placed around the basin frame. The basin frame is lowered into the basin with the gasket resting against the top of the basin body. A casting mixture is injected into the cavity between the frame and the surrounding asphalt, and the frame is lowered further into the correct position relative to the road. This is possible since the gasket is compressible and may be compressed as needed. The basin frame is the attached to the road's top coating, and may slide freely inside the top of the basin. The basin frame will float freely in step with the road raising and lowering.

[0003] When paving a road, and in particular a city street, it is important that installation and levelling of basin frames is carried out quickly. Paving must often be done at night when there is little traffic and the street may be closed. As soon as the pavers have passed a basin, the basin frame is raised, cleaned or replaced, and mounted again at the correct height.

Summary of the Invention

[0004] It is an object of the present invention to provide a method for levelling a basin frame, and a device especially designed for this method, which is easier and faster to perform than prior art methods.

[0005] This is achieved in a method and device as defined in the appended patent claims.

[0006] In particular the invention relates to a method for installing or renovating a basin in relation to a surface, wherein the basin includes at least a basin body with top, frame and cover. A first step in the method includes lifting the basin frame from the basin body into a first position. Then, a formwork ring is placed around the basin top, whereupon the basin frame is lowered into a second position wherein the frame is aligned on a level with said surface, the basin frame running through said formwork ring and into the basin body, whereupon a casting mixture is injected into a cavity formed between the surrounding ground and the basin frame. This method prevents the basin frame from fastening to the top of the basin. Thus, it may always move independent of the basin body itself.

[0007] The invention also relates to a formwork ring for use in said method, wherein the formwork ring includes an annular skirt and an inward facing flange fastened to one end of the skirt, the flange being adapted to fit tightly around the basin frame. The skirt is dimensioned to project outside the basin top and is adapted to rest on mass outside the basin top. The formwork ring secures the presence of a cavity between the basin frame and basin top.

[0008] The formwork ring may include a gasket fastened to the inner circumference of the flange. This gasket prevents casting mixture from penetrating between the formwork ring and basin frame.

[0009] Said skirt may be cylindrical. This may allow some movement between the formwork ring and the basin body.

[0010] Alternatively, the skirt may be conical. Such a design allows stacking of the formwork rings for easier transport.

[0011] The formwork ring may be produced in metal, a fibrous material or a polymer. The formwork ring must be strong enough to maintain its shape when the casting mixture is injected and affordable to produce. It may be advantageous to produce the formwork ring in a fibrous material if the ring should decompose subsequent to the casting process.

[0012] According to an alternative embodiment of the invention, the skirt and flange of the formwork ring are produced in a stiff polymer material and the gasket shaped as a lip in a flexible polymer material, the formwork ring being produced as one unit. This allows the ring to be produced in a cost effective process. The lip will close tightly around the basin frame and be bent downwards when this is mounted.

[0013] The formwork ring may also be produced with the flange as a separate flat ring or washer with a groove around the periphery, the skirt being shaped as a flat side wall that is adapted to be bent and snapped into the groove. This allows the ring to be transported as a flat pack and assembled at the place of use.

Brief Description of the Drawings

[0014] Subsequently, the invention will be described

in detail in reference to the appended drawings, in which:

Fig. 1 shows a prior art basin, wherein the height of the basin frame should be adjusted,

Fig. 2 illustrates a first step in renovating the basin,

Fig. 3 shows the next step, with the installation of a formwork ring according to the invention,

Fig. 4 shows the basin frame being reinstalled at correct height,

Fig. 5a-b shows possible embodiments of a formwork ring according to the invention.

Detailed Description

[0015] Fig. 1 shows a basin with a body 1 and top 2, which is installed in the ground. Above the ground 3 there is filled a layer of draining gravel 4. Onto the gravel 4 there is established a road with layers of asphalt 5 and substrate 6. A basin frame 7 with flange 8 and cover 9 is running through the upper layers 5 and 6. The basin frame is fastened to the upper layers, but is intended to slide freely inside the basin body 1, i.e. the basin frame is of the floating variety. This will not always work as intended, as mass will fill up to the basin frame and prevent the frame from sagging down. In case the road surface lifts, e.g. as a result of frost, a void will be formed, whereupon loads on the frame (from the traffic) will press it into the cavity and thus form unevenness between the road surface and basin frame. In this case, the basin frame has sunk and has to be elevated to come into a correct level relative to the road surface 10.

[0016] Fig. 2 shows the same basin. The basin frame is now removed (and cleaned from old asphalt and rust), while the edge of the opening in the road surface is aligned and prepared for reinstallation of the basin frame.

[0017] Fig. 3 shows the provision of a formwork ring 11 in the opening. The formwork ring 11 rests on the gravel outside the basin body.

[0018] In Fig. 4 the basin frame is lowered into the opening and adjusted into a correct level relative to the road surface. A dedicated tool or machinery is used for this task (not shown). The position of the basin frame in the basin body is controlled by the formwork ring 11. Then, a casting mixture 12 is injected into the cavity outside the formwork ring, while the basin frame is being held at the correct level. The formwork ring will prevent the casting mixture from contacting the lower parts of the frame, thus preventing the casting mixture from adhering to the frame in the area where it enters the basin body, while the casting mixture simultaneously glues the basin frame to the upper layers of the road. When the mass has hardened, said tool may be removed and the installation of the basin frame is finished.

[0019] Fig. 5a shows a possible embodiment of the formwork ring 11. The formwork ring includes a skirt 111, an inward facing flange 112 which is attached to an (upper) end of the skirt 111, and a gasket 113 attached to the inner circumference of the flange 112. The gasket may be loose and only pressed onto the flange 112. The object of the gasket is to prevent casting mixture from protruding between the basin frame and the formwork ring into the cavity inside the formwork ring. Here, the ring is cylindrical in shape and may be produced in dimensions fitting standard basins, i.e. the ring fitting tightly around the circumference of the basin top. The formwork ring may be assembled from several parts or cast in one piece, and may be produced in any suitable material, such as metal, a fibrous material or a polymer. The formwork ring may also be without any gasket, in case it fits tightly enough around the basin body, or the casting mixture being of a nature to allow this. The formwork ring may also be produced of polymer in one piece, the skirt and flange preferably being produced of a relatively stiff polymer, while the gasket is produced in a more elastic polymer forming a lip turned inwards into the ring.

[0020] Fig. 5b shows another embodiment of the formwork ring, where the skirt 111 is conical. The main advantage of this embodiment is the possibility of stacking the ring in storage or during transport in order to occupy less space.

[0021] The formwork ring may also be produced as a kit, with a flat ring forming the flange, and a flat side wall which may be bent into shape and then snapped into a groove along the outer edge of the flange ring (not shown). This also alleviates storage and transport of the formwork rings.

[0022] The formwork ring may be of miscellaneous shapes, i.e. shaped as a circular ring, or a square or rectangular ring, or any other shape fitting the appearance of the basin top and frame.

Claims

1. A method for installing or renovating a basin in relation to a surface,
   wherein the basin includes at least a basin body (1) with top (2), frame (7) and cover (9), the method including lifting the basin frame from the basin body into a first position,
   characterized in the further steps of
   placing a formwork ring (11) around the basin top (2),
   lowering the basin frame into a second position wherein the frame is aligned on a level with said surface, the basin frame running through said formwork ring and into the basin body,
   injecting a casting mixture into a cavity formed between the surrounding ground and the basin frame.

2. A formwork ring (11) for use when installing or renovating a basin in relation to a surface, the basin including at least a basin body (1) with top (2), frame

(7) and cover (9),
the formwork ring including an annular skirt (111) and an inward facing flange (112) attached to one end of the skirt, the flange (112) being adapted to fit tightly around the basin frame (7),
characterized in that the skirt is (111) dimensioned to project outside the basin top (2) and is adapted to rest on mass outside the basin top (2).

3. A formwork ring according to claim 2, further including a gasket (113) fastened to the inner circumference of the flange (112).

4. A formwork ring according to claim 2, wherein the skirt is cylindrical.

5. A formwork ring according to claim 2, wherein the skirt is conical.

6. A formwork ring according to claim 2, the formwork ring being produced in metal, a fibrous material or a polymer.

7. A formwork ring according to claim 2, wherein the skirt and flange are produced in a stiff polymer material and the gasket is shaped as a lip in a flexible polymer material, the formwork ring being produced as one unit.

8. A formwork ring according to claim 2, wherein the flange is produced as a separate flat ring or washer with a groove around the periphery, the skirt being shaped as a flat side wall that is adapted to be bent into shape and snapped into the groove.

Figure 1

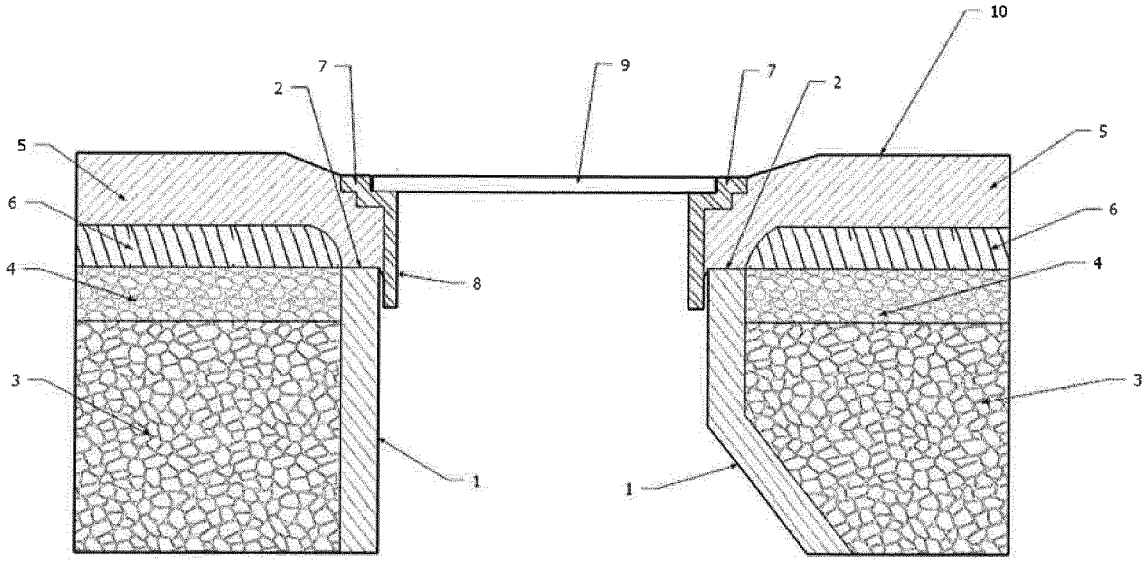


Figure 2

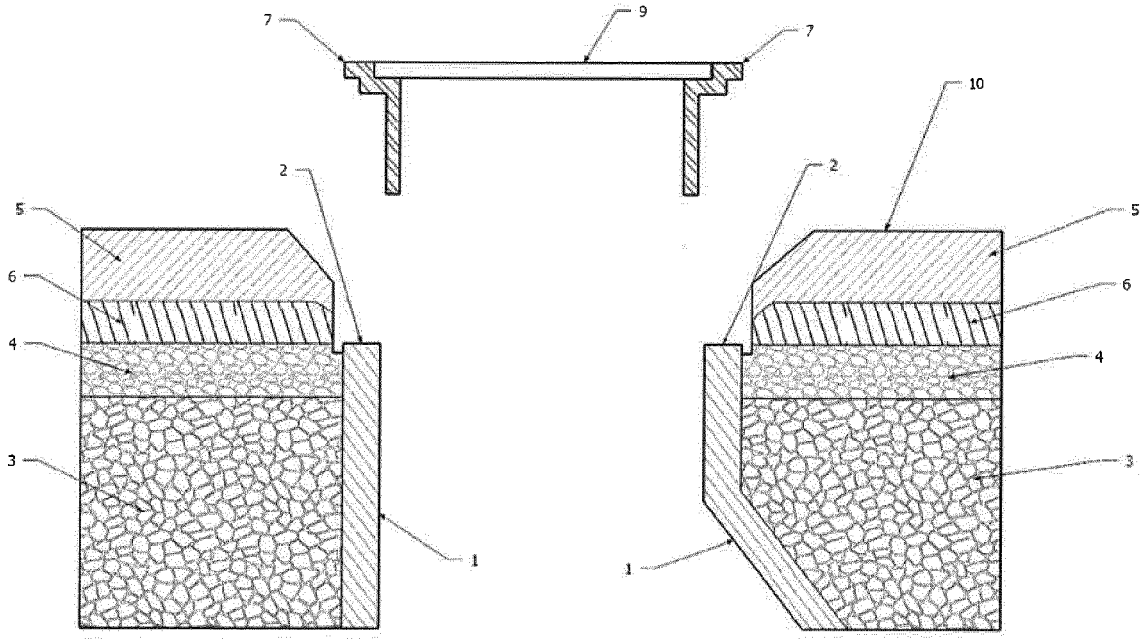


Figure 3

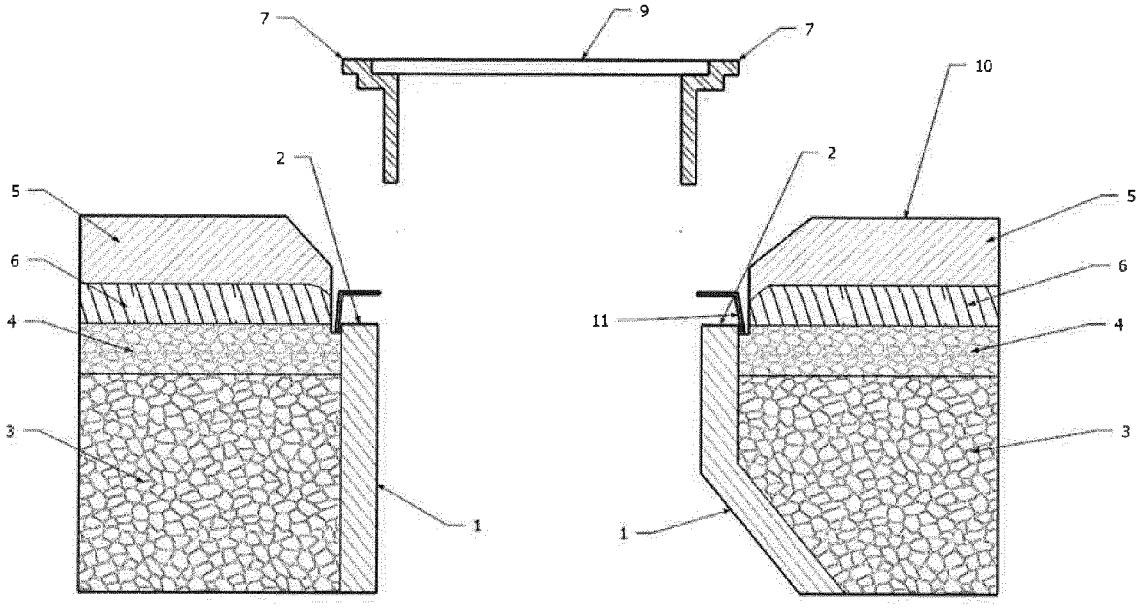


Figure 4

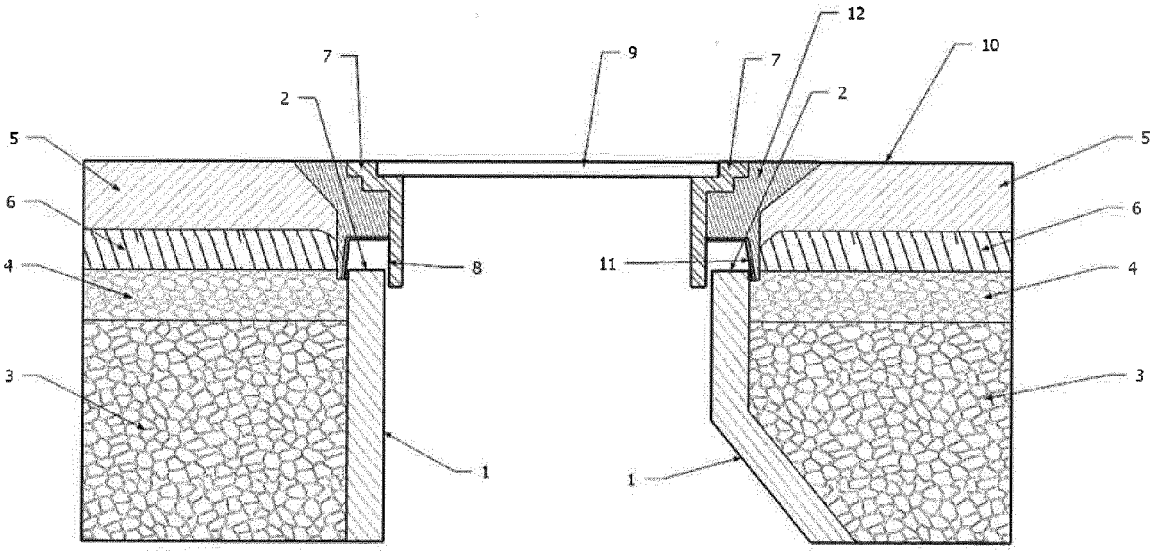


Figure 5a

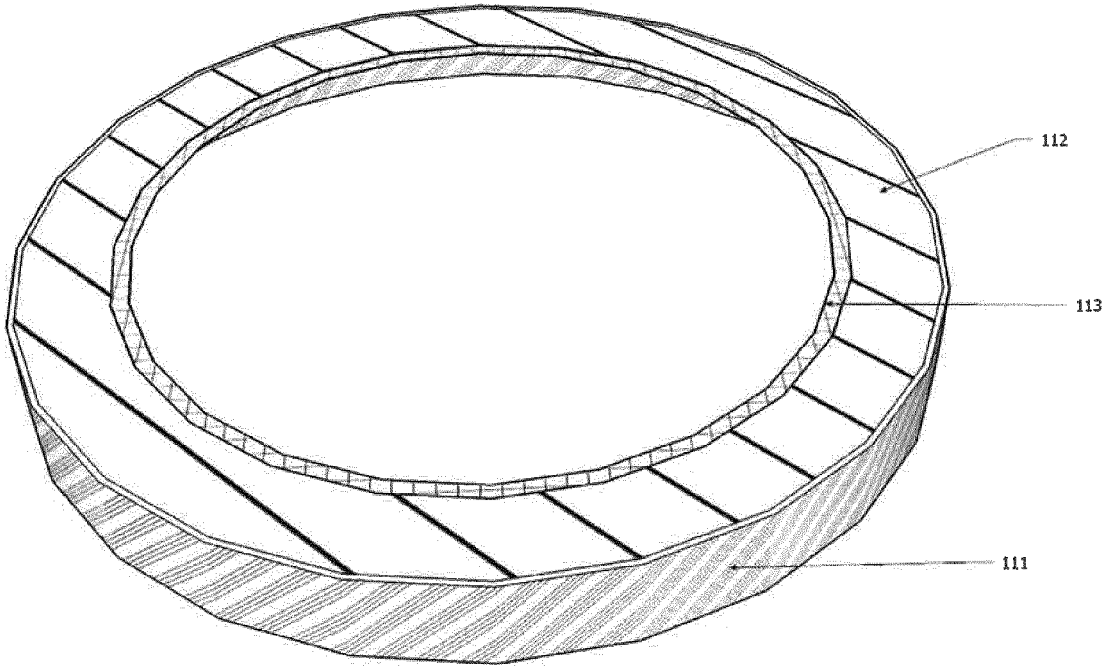
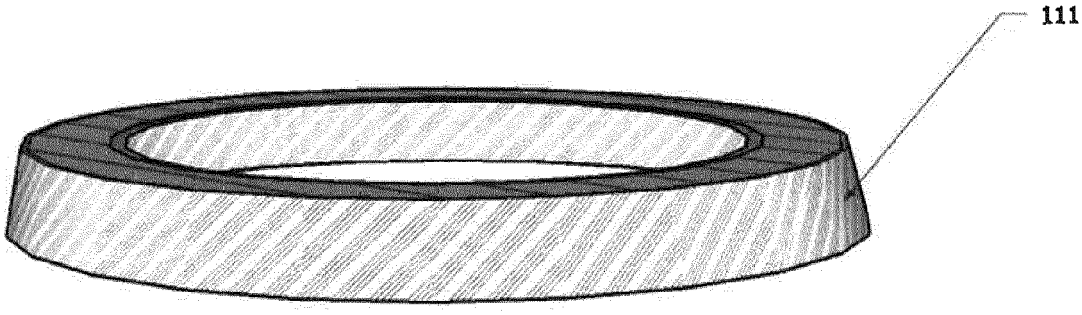


Figure 5b



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EUROPEAN SEARCH REPORT

Application Number
EP 15 19 0621

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 128 344 A1 (POULSEN BJARNE HENNING [DK]) 2 December 2009 (2009-12-02)	1	INV. E02D29/14
A	* paragraph [0030] - paragraph [0030]; figure 5 *	2-8	

TECHNICAL FIELDS SEARCHED (IPC)

E02D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 December 2015	Geiger, Harald

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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22-12-2015

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		DK 176838 B1	30-11-2009
		DK 2128344 T3	26-03-2012
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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