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(71) Applicant: **Profilpas S.p.A.**
35010 Cadoneghe PD (IT)

(72) Inventor: **PASQUALI, Marco**
35139 PADOVA (IT)

(74) Representative: **Mittler, Andrea et al**
MITTLER & C. s.r.l.
Viale Lombardia, 20
20131 Milano (IT)

(54) **DRAIN UNIT FOR SHOWERS**

(57) A drain unit (1) for showers is described, comprising a sump (3), a siphon (4) housed in the sump (3), a channel (2) and a grid (5) suitable for filtering the drain water conveyed by the channel (2) at the entrance of the sump (3). The grid (5) has an opening (51) and a plurality of slits (52) in series which form a C-shape around said opening (51). The siphon (4) comprises a rear wall (42), an intermediate wall (43) and a front wall (44). The intermediate wall (43) has a curved surface (433) able to convey the drain water into a union (31) of the siphon (4) able to couple with a union (41) of the sump (3).

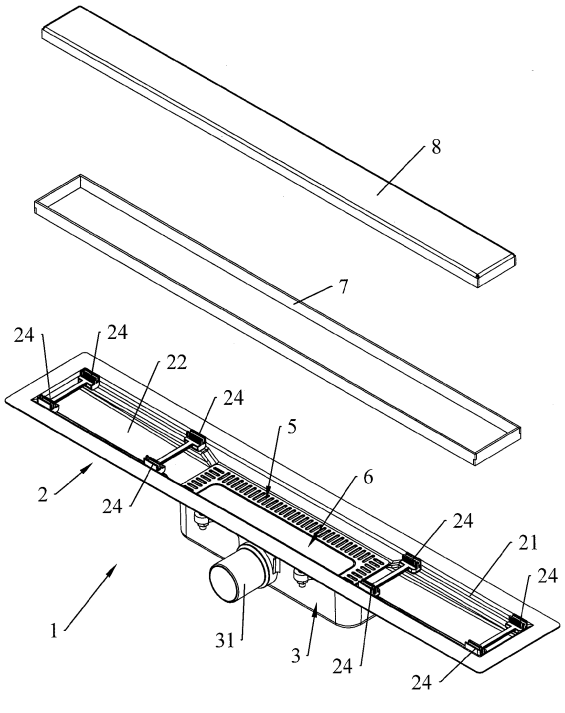

FIG.1

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Description

[0001] The present invention relates to a drain unit for showers.

[0002] The request for design in bathrooms for years now has transformed the bathroom into a place in which to relax and take care of one's body.

[0003] In particular, the shower has become a true contemporary design element in which functionality is combined with elegance.

[0004] The most modern shower models are flush with the floor, without the unpleasant shower tray, in which the water is drained by drain units also adapted to filter the water, for example by grids.

[0005] The drain unit comprises channels usually positioned on the edge of the shower, flush with the wall, thus creating a single shower plane which continues with the bathroom floor.

[0006] There is a need to combine the appearance of the shower with efficient draining of the water.

[0007] FR-3026420 describes a drain unit for showers comprising a sump, a container, a grid and a seal.

[0008] The grid is associated with a cover, which is in a middle position with respect to the lid, and is elongated in shape, transversely narrow.

[0009] A vertical wall is associated with the grid and protrudes downwards so that, together with the underlying container, it forms a shape in vertical section which forces the water to flow down from the grid along a single central channel, and then it rises along two side channels through which it finishes in the sump and then in the drain system of the building through a union in the longitudinal direction of the drain unit.

[0010] The vertical wall in cross section is elongated in shape, with long straight side walls joined by a curved end, the drain water from the grid passing therethrough.

[0011] The shape of the grid combined with the one of the vertical wall, the container and the sump creates a forced path for the drain water from the middle to the periphery of the drain unit, in a vertical sectional view.

[0012] The attachment of the grid to the vertical wall and the container is complex for the operator.

[0013] The drain unit also has a closing lid which makes the assembly with a plurality of screws even more difficult.

[0014] FR-2942820 describes a drain unit with a grid resting on a siphon, which conveys the drain water towards the back of a sump in which the siphon is housed.

[0015] The sump comprises a vertical wall which creates a forced downwards path, rise and descent again of the water towards a plurality of drain unions into the drain system of the building. The axis of the unions is transverse to the longitudinal direction of the siphon.

[0016] Disadvantageously, the sump has a complex shape (vertical wall and a plurality of unions). Moreover, the siphon is not well fastened to the sump and may therefore move following high water pressures; consequently, also the grid may take on anomalous positions.

[0017] DE-102011013296, EP-2252743 and EP-2299015 describe water drain units.

[0018] It is the object of the present invention to provide a drain unit for showers comprising few easy-to-assemble components.

[0019] It is a further object of the present invention that the drain unit allows a more efficient path for the drain water.

[0020] It is a further object again of the present invention that the drain unit is affordable and easily associated with the drain system of a building.

[0021] According to the invention, the aforementioned and further objects are achieved by a drain unit for showers comprising a sump, a siphon housed in the sump, a channel and a grid suitable for filtering the drain water conveyed by the channel at the entrance of the sump, characterized in that

the grid has an opening and a plurality of slits in series which form a C-shape around said opening, wherein a straight edge of the grid closes the outline of the opening,
the siphon comprises a rear wall, an intermediate wall and a front wall, wherein the intermediate wall has a curved surface suitable for conveying the drain water into a union of the siphon able to couple with a union of the sump,
the siphon being open at the bottom and closed at the top by a lid, so that the drain water flows down into the sump through the grid, then rises into the siphon between the rear wall and the back of the intermediate wall, and finally flows down along the curved surface towards the union of the siphon,
wherein the grid is positioned above the siphon so that the edge of the opening is flush with an edge of the lid of the siphon.

[0022] The coupling of the shapes of the sump and the siphon ensures an effective disposal of the drain water without unpleasant odors coming back up.

[0023] Advantageously, the drain unit comprises a limited number of components which are easy to assemble and are removable for effective cleaning.

[0024] The shape of the walls of the siphon ensures both a continuous flow of the pressurized drain water and the absence of foul odors in the absence of pressure.

[0025] The space inside the sump is optimally exploited: said space allows the siphon to be completely housed, the water to flow down through the grid, the siphon and the sump to be easily coupled and uncoupled.

[0026] These and other features of the present invention will become further apparent from the following detailed description of practical embodiments thereof illustrated by way of non-limiting example in the accompanying drawings, in which:

Figure 1 shows a top perspective view of a drain unit according to the present invention;
Figure 2 shows an exploded top perspective view of

the drain unit;
Figure 3 shows a front view of the drain unit;
Figure 4 shows a top plan view of the drain unit;
Figure 5 shows a section view taken along line V-V of Figure 3;
Figure 6 shows a section view taken along line VI-VI of Figure 4;
Figure 7 shows a front view of a siphon of the drain unit;
Figure 8 shows a top plan view of the siphon;
Figure 9 shows a bottom plan view of the siphon;
Figure 10 shows a side view of the siphon;
Figure 11 shows an exploded top perspective view of the siphon;
Figure 12 shows an exploded bottom perspective view of the siphon.

[0027] A drain unit 1 for showers comprises a channel 2, a sump 3 and a siphon 4 (Figures 1 and 2).

[0028] The channel 2 is provided with an edge 21 and flat surfaces 22 which are inclined towards a central opening 23 through which siphon 4 is housed in sump 3.

[0029] The drain unit 1 also comprises a grid 5 which filters the drain water at the entrance of sump 3, and a lid 6 which closes siphon 4 at the top so as to avoid foul odors from coming back up.

[0030] Supports 24 for a frame 7 and a cover 8 are positioned close to the edge 21 of the channel 2 (Figure 1).

[0031] The frame 7 preferably has a rectangular-shaped rim and serves to level the drain unit 1 with the floor of the shower.

[0032] As shown in Figure 5, the cover 8 is contained in the frame 7 and serves an aesthetical function while allowing the passage of the drain water through side slits between the sides of the cover 8 and the frame 7 (see the arrows with no reference numerals).

[0033] Figures 3 to 5 also show a plastic layer 60 resting on the edge of the channel 2.

[0034] The grid 5 (Figure 2) has an opening 51 and a plurality of slits 52 in series which form a C-shape around said opening 51. A straight edge 53 with no slits closes the outline of the opening 51 and allows an optimal resting of the channel 2 on the edge 21.

[0035] The drain unit 1 also comprises a seal 9 around the lid 6 of the siphon 4, and a seal 10 at the edge of the sump 3.

[0036] The siphon 4 comprises a union 41 able to couple with a union 31 of the sump 3, which in turn is coupled with the drain system of a building.

[0037] The siphon 4 also has a rear wall 42, an intermediate wall 43 and a front wall 44 (Figures 7 to 12).

[0038] The front wall 44 is interrupted in the middle by the union 41, which protrudes outwardly from the front wall 44.

[0039] The front and rear walls 44, 42 define the dimensions of the siphon 4 in a transverse direction which is coincident with the drain water outlet direction through the union 41.

[0040] The intermediate wall 43 is provided with a curved surface 433 able to convey the drain water into the union 41, and is supported by the front and rear walls 44, 42 by two internal transverse walls 48 (Figure 11).

[0041] The siphon 4 is open at the bottom while it is closed at the top by the lid 6.

[0042] As is apparent in Figure 7, the front wall 44 preferably has a V-shaped lower edge 441 which facilitates the entrance of the water from below, as will be clarified in greater detail below.

[0043] The rear wall 42 has a preferably straight lower edge 421 which is raised with respect to the support bottom of the sump 3: the entrance of the water into the siphon 4 occurs without obstacles from the bottom of the sump 3 so as to create a path for the water, as clearly shown in Figures 5 and 6 (arrows with no reference numerals), that is it flows down into the sump 3 through the grid 5, then rises in the siphon 4 between the back of the intermediate wall 43 and the inner part of the rear wall 44, and finally flows down along the curved surface 433 towards the union 41.

[0044] The water also enters laterally through windows 46 made at side walls 47, which delimit the siphon 4 in longitudinal direction (Figure 6).

[0045] The drain water is shown in Figures 5 and 6 with a dense dotted section, in a resting step in which there is no flow of drain water. When there is said flow, the water flows over the edge from the upper end of the intermediate wall 43, on the curved surface 433 to then flow into the union 31.

[0046] The siphon 4 is provided with transversal shims 45 able to reinforce the intermediate wall 43 (Figure 11): in coupling step with the sump 3, in particular of the unions 31, 41, said transversal shims 45 allow an optimal thrust in transverse direction without the risk of breaking or deforming the intermediate wall 43, which is essential to make the disposal of the drain water efficient.

[0047] The intermediate wall 43 is also able to be coupled by the lid 6 by coupling means 61 which preferably have the shape of teeth which snap couple with the intermediate wall 43 inside the siphon 4.

[0048] The coupling of the lid 6 to the siphon 4 is also ensured by further coupling means 61, even more preferably teeth-shaped, which couple with the internal transverse walls 48.

[0049] A pair of seals 11 of the O-ring type ensures the sealing of the coupling between said unions 31, 41.

[0050] The sump 3 has a substantially rectangular shape in horizontal section and is provided with two long vertical walls 32, in particular a front long vertical wall 321 and a rear long vertical wall 322, and two short vertical walls 33. The union 31 protrudes outwardly from the front long vertical wall 32, in median position.

[0051] Fastening means 50, preferably bolts, are able to connect the channel 2 to the sump 3 (Figure 2).

[0052] The assembly of the drain unit 1 is very simple.

[0053] After positioning the sump 3 in a compartment

prepared below the floor in fluid connection with the drain system by the union 41, the siphon 4 is inserted, preferably already with the lid 6, into the sump 3 while coupling the unions 31, 41 with the intermediation of the seals 11: the transverse dimension of the sump 3 allows the insertion from the top and then the thrust in transverse direction so that the union 41 couples with the union 31.

[0054] The front wall 44 of siphon 4 substantially rests against the front wall 321 of the sump 3, leaving space in the rear zone of the sump 3 between the rear wall 322 of sump 3 and the rear wall 42 of siphon 4 for the entrance of the water into sump 3, as will be clarified in greater detail below.

[0055] The assembly is concluded by simply coupling the channel 2 with the sump by the fastening means 5, and the frame 7 and the cover 8 with the supports 24 of the channel 2.

[0056] The dimensions of the siphon 4 are such as to leave empty space in the sump 3, in particular at the back and laterally, into which the drain water may flow through the slits 52 of the grid 5 which is positioned above the siphon 4, resting on the channel 2, so that the edge of the opening 51 is flush with an edge 62 of the lid 6 of the siphon 4 (Figures 5 and 6): advantageously, the drain water may enter into the sump 3 only through the slits 52, thus taking advantage of a space inside the sump 3 around the siphon 4; the drain water flows down along the short vertical walls 33 and the rear long vertical part 322.

[0057] The grid 5 is slightly larger than the central opening 23 of the channel 2 so as to overlap it.

[0058] By pressure, caused by the water flowing down along the channel 2, the water then rises in the siphon 4 between the rear wall 42 and the back of the intermediate part 43 to finally flow downwards along the curved surface 433 so as to flow into union 31 and then into the drain system of the building (Figures 5 and 6).

[0059] The coupling of the shapes of the sump 3 and the siphon 4 ensures an effective disposal of the drain water without unpleasant odors coming back up.

[0060] The coupling with channel 2 ensures a pleasant continuity of the shower with the floor while keeping the sump 3, the siphon 4 and the grid 5 completely concealed.

[0061] The lid 6 of the siphon 4 and the grid 5 may become the object of design by using a transparent cover 8.

[0062] Advantageously, the drain unit 1 comprises a limited number of components which are easy to assemble and are removable for effective cleaning.

[0063] The shape of the walls 42-44 of the siphon 4 ensures both a continuous flow of the pressurized drain water and the absence of foul odors in the absence of pressure.

[0064] The space inside the sump 3 is optimally exploited: said space allows the siphon 4 to be completely housed, the water to flow down through the grid 5, the siphon 4 and the sump 3 to be easily coupled and uncoupled.

[0065] The sump 3 has a simple shape with a completely usable inner compartment.

[0066] The drain water flows out of the drain unit 1 in transverse direction, thus optimizing the flow by virtue of the curved shape of the curved surface 433 which effectively promotes the water to pass through the union 31.

[0067] The shape of the curved surface 433 allows a single union 31 to be used for the outlet of the drain water also in the event of increased flows of drain water: consequently, there are no unpleasant accumulations of water on the floor of the shower due to a slow drain flow.

[0068] The coupling between the unions 31, 41 ensures an optimal fastening of the siphon 4 to the sump 3; accordingly, also the grid 5 remains in position for a continuous and effective flow.

Claims

1. Drain unit (1) for showers comprising a sump (3), a siphon (4) housed in the sump (3), a channel (2) and a grid (5) suitable for filtering the drain water conveyed by the channel (2) at the entrance of the sump (3), **characterized in that**

   the grid (5) has an opening (51) and a plurality of slits (52) in series which form a C-shape around said opening (51), wherein a straight edge (53) of the grid (5) closes the outline of the opening (51),
   the siphon (4) comprises a rear wall (42), an intermediate wall (43) and a front wall (44), wherein the intermediate wall (43) has a curved surface (433) suitable for conveying the drain water into a union (31) of the siphon (4) able to couple with a union (41) of the sump (3),
   the siphon (4) being open at the bottom and closed at the top by a lid (6), so that the drain water flows down into the sump (3) through the grid (5), then rises into the siphon (4) between the rear wall (42) and the back of the intermediate wall (43), and finally flows down along the curved surface (433) towards the union (31) of the siphon (4),
   wherein the grid (5) is positioned above the siphon (4) so that the edge of the opening (51) is flush with an edge (62) of the lid (6) of the siphon (4).

2. Drain unit (1) according to claim 1, **characterized in that** the rear wall (42) has a lower edge (421) which is raised with respect to the bottom of the sump (3).

3. Drain unit (1) according to claim 2, **characterized in that** the intermediate wall (43) is supported by the front and rear walls (44, 42) by two internal transverse walls (48).

4. Drain unit (1) according to claim 3, **characterized in that** the siphon (4) has side walls (47) provided with windows (46) for the passage of the drain water.

5. Drain unit (1) according to any one of the preceding claims, **characterized in that** the siphon (4) has transversal shims (45) able to reinforce the intermediate wall (43).

6. Drain unit (1) according to any one of the preceding claims, **characterized in that** the distance between the front and rear walls (44, 42) defines the dimensions of the siphon (4) into the sump (3) in a transverse direction which is coincident with the drain water outlet direction through the union (41) which protrudes from the front wall (42) and at least partially fits in the union (31) of the sump (3).

7. Drain unit (1) according to any one of the preceding claims, **characterized in that** the channel (2) has flat surfaces (22) which are inclined towards a central opening (23) of the channel (2) able to be crossed by the siphon (4) when it is housed in the sump (3), wherein the grid (5) is slightly larger than the central opening (23) of the channel (2) so as to overlap it.

8. Drain unit (1) according to claim 7, **characterized in that** it comprises a frame (7) and a cover (8), wherein the channel (2) comprises an edge (21) on which supports (24) for the frame (7) and the cover (8) are positioned, the drain water flowing into the sump (3) through side slits between the sides of the cover (8) and the frame (7).

9. Drain unit (1) according to any one of the preceding claims, **characterized in that** the front wall (44) has a V-shaped lower edge.

10. Drain unit (1) according to any one of the preceding claims, **characterized in that** the sump (3) has a substantially rectangular shape in horizontal section, and provides two long vertical walls (32), in particular a front long vertical wall (321) and a rear long vertical wall (322), and two short vertical walls (33), the union (31) protruding outwardly from the front long vertical wall (321) in a median position.

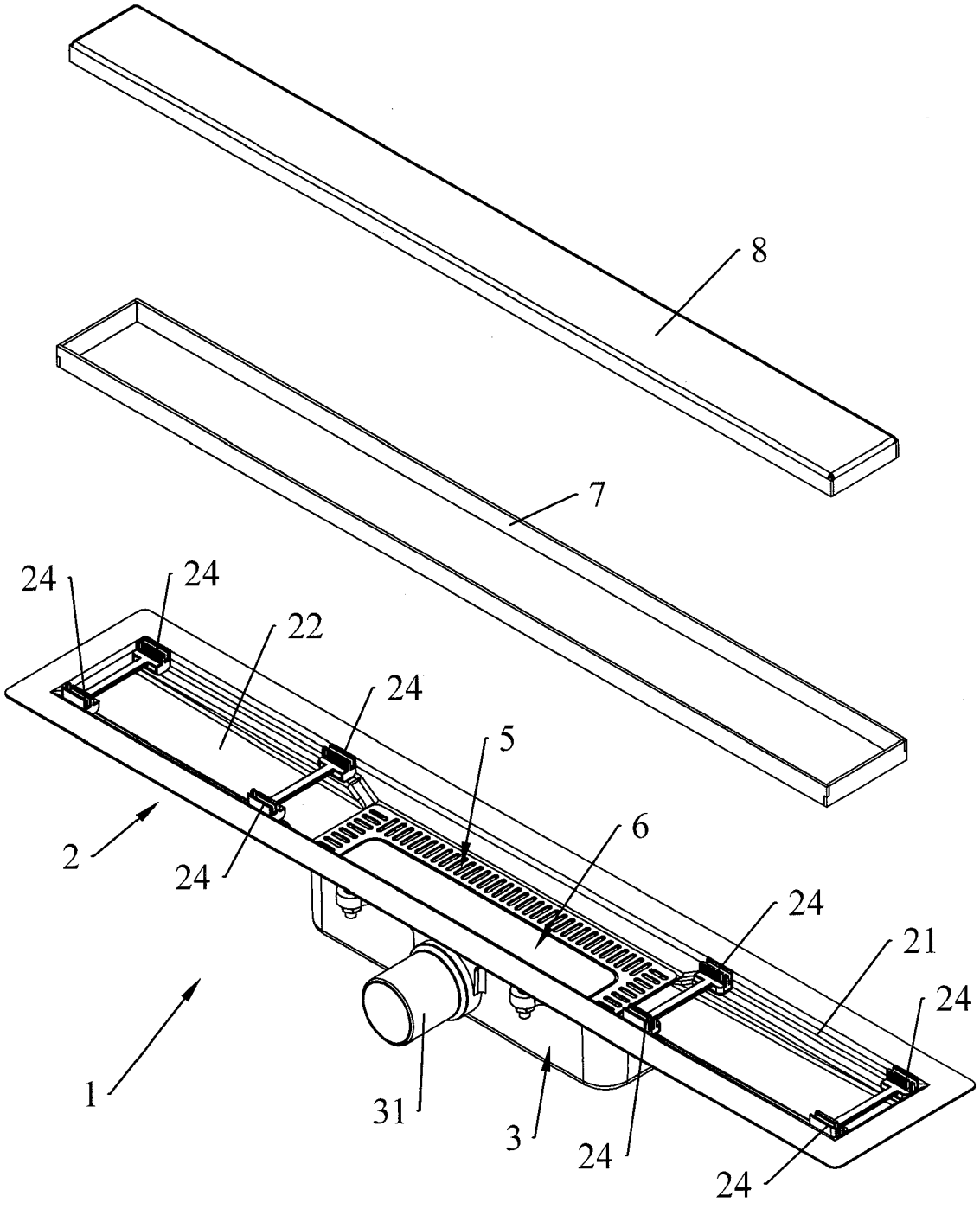
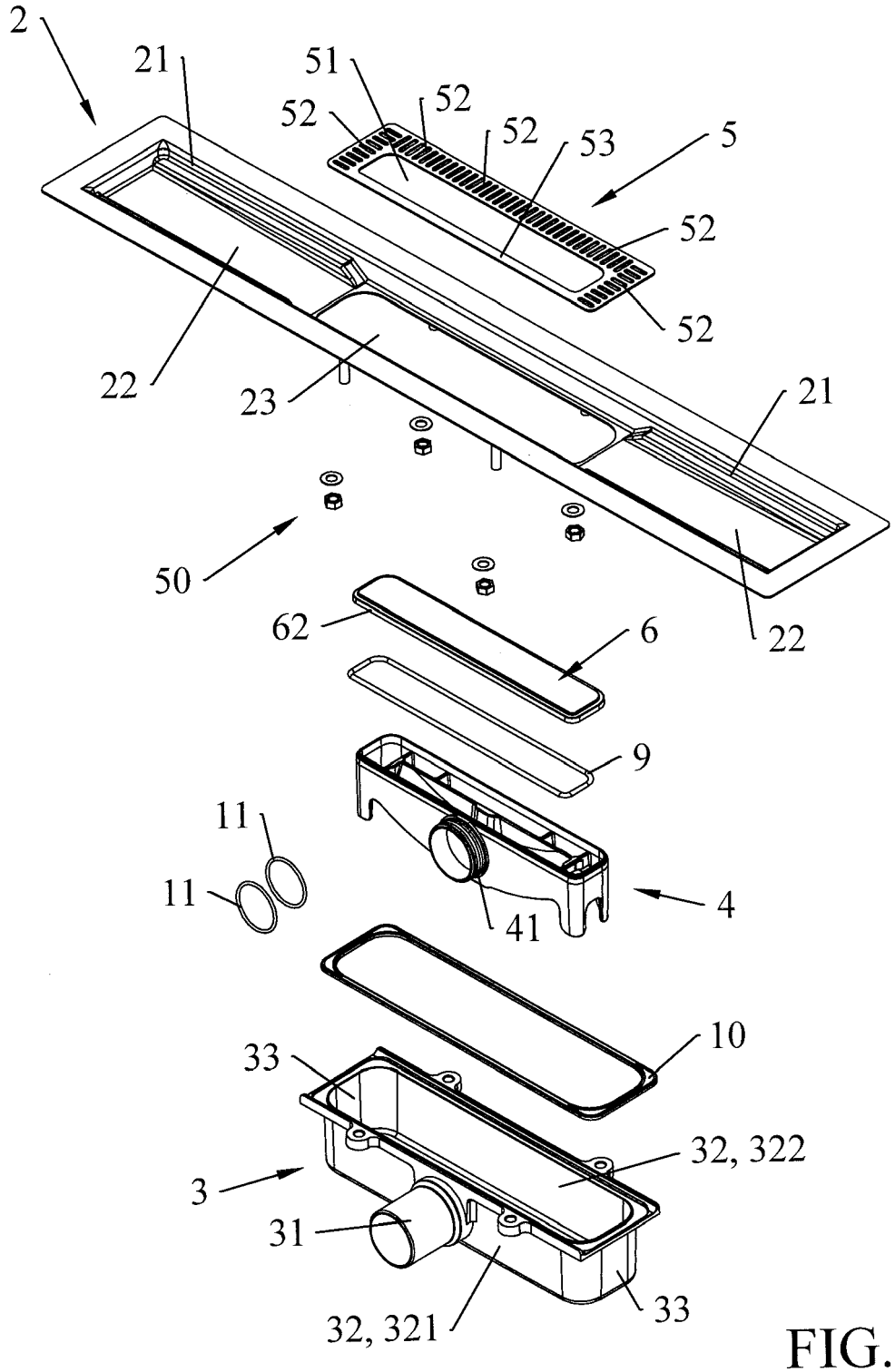


FIG.1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33

FIG.2

FIG.3

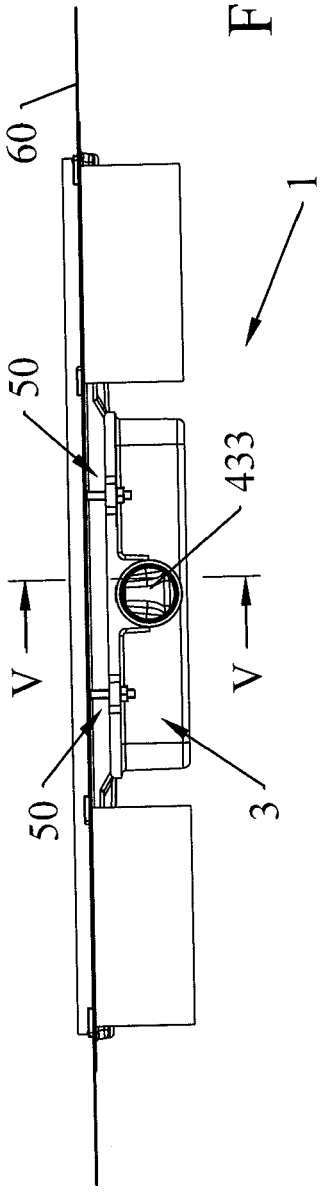
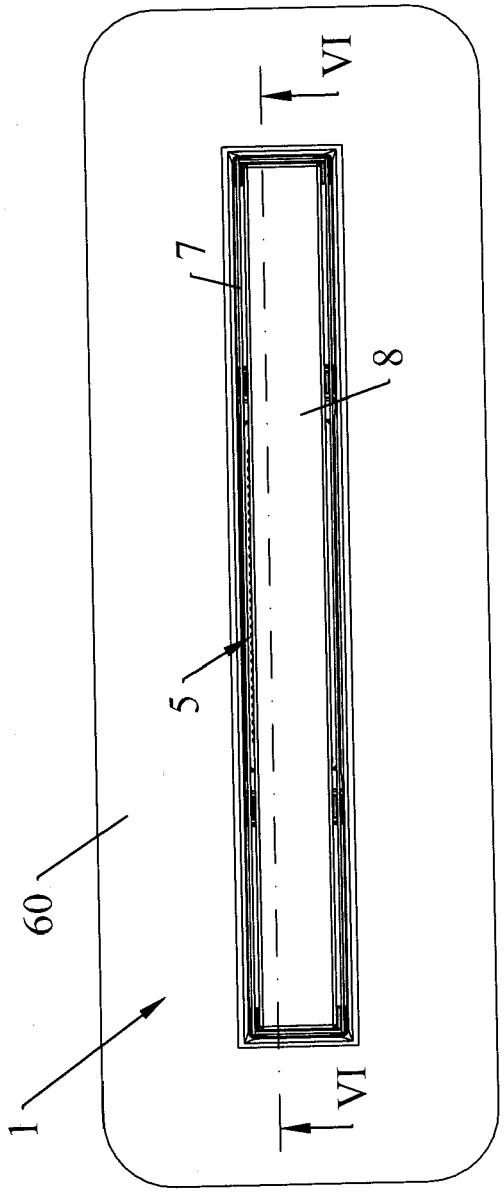
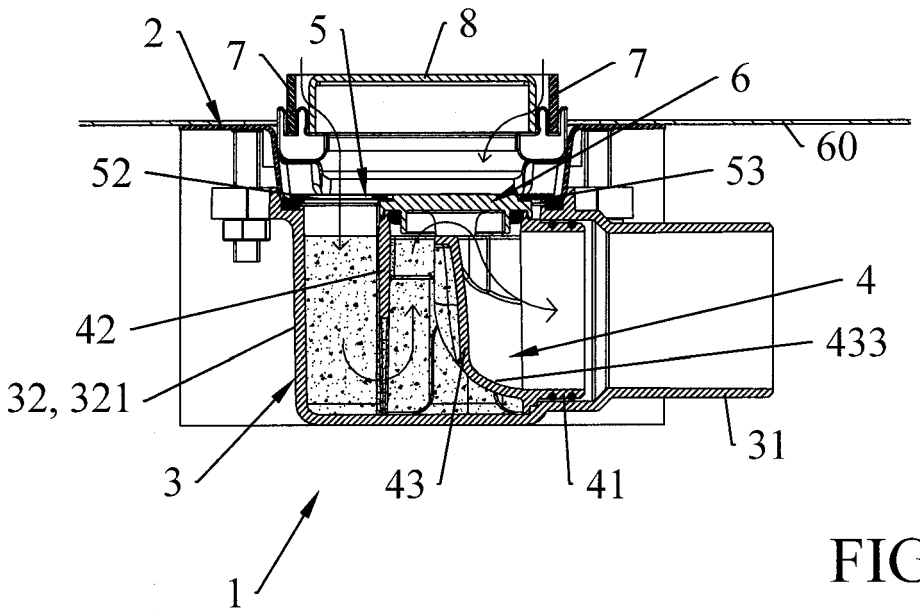


FIG.4

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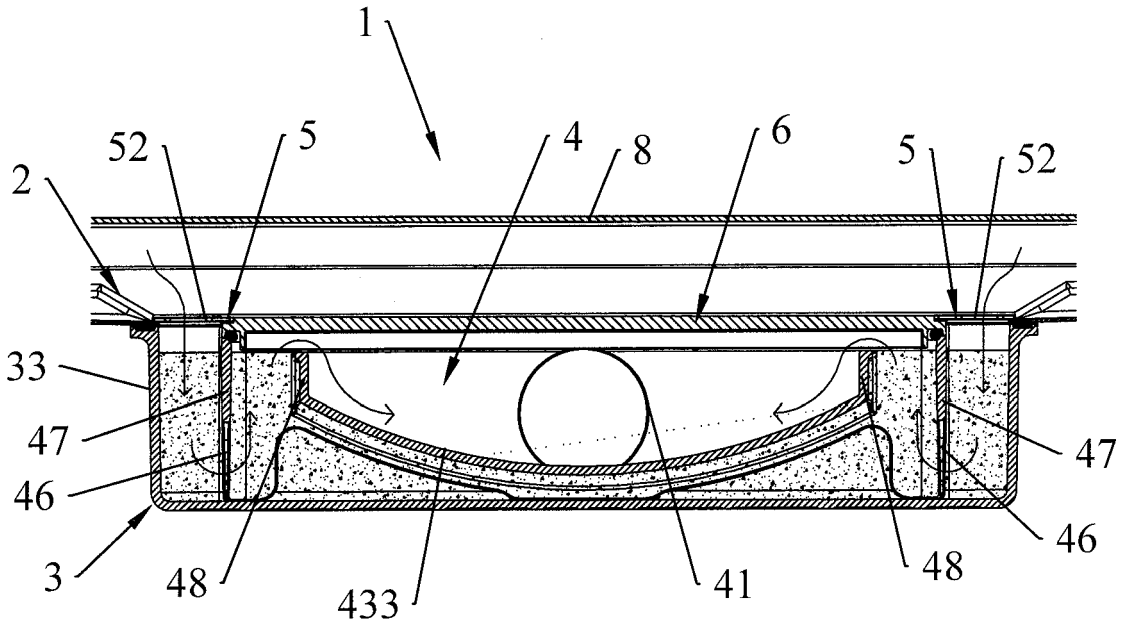
42
433
32, 321
31
3
43
41
1

FIG.5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46
3
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433
41
48
47
46

FIG.6

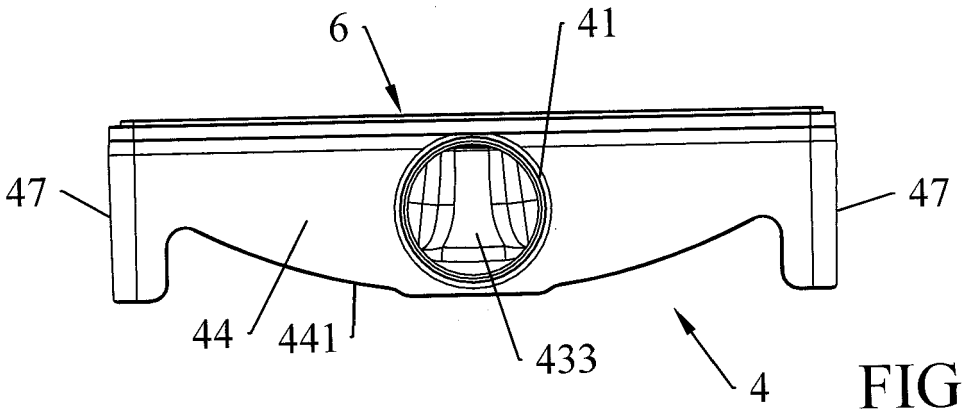

FIG.7

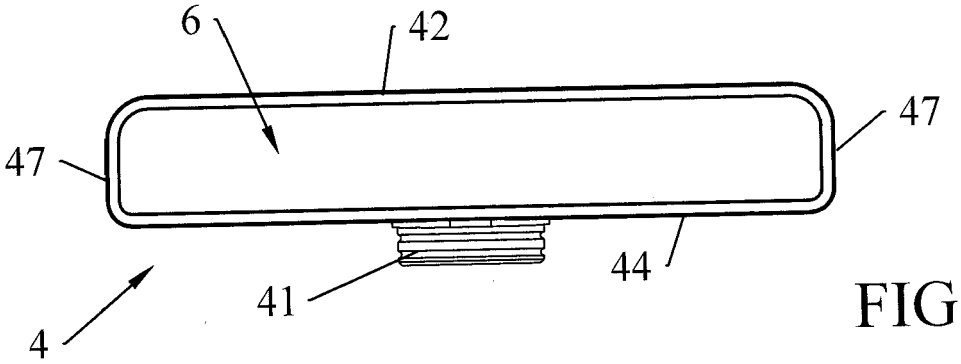

FIG.8

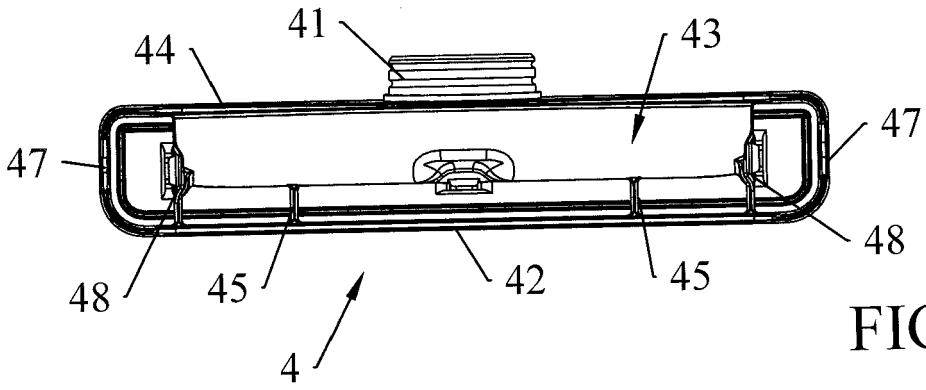

FIG.9

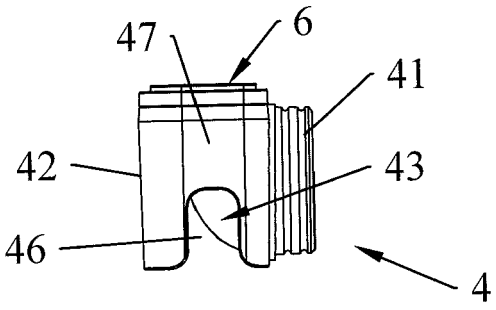

FIG.10

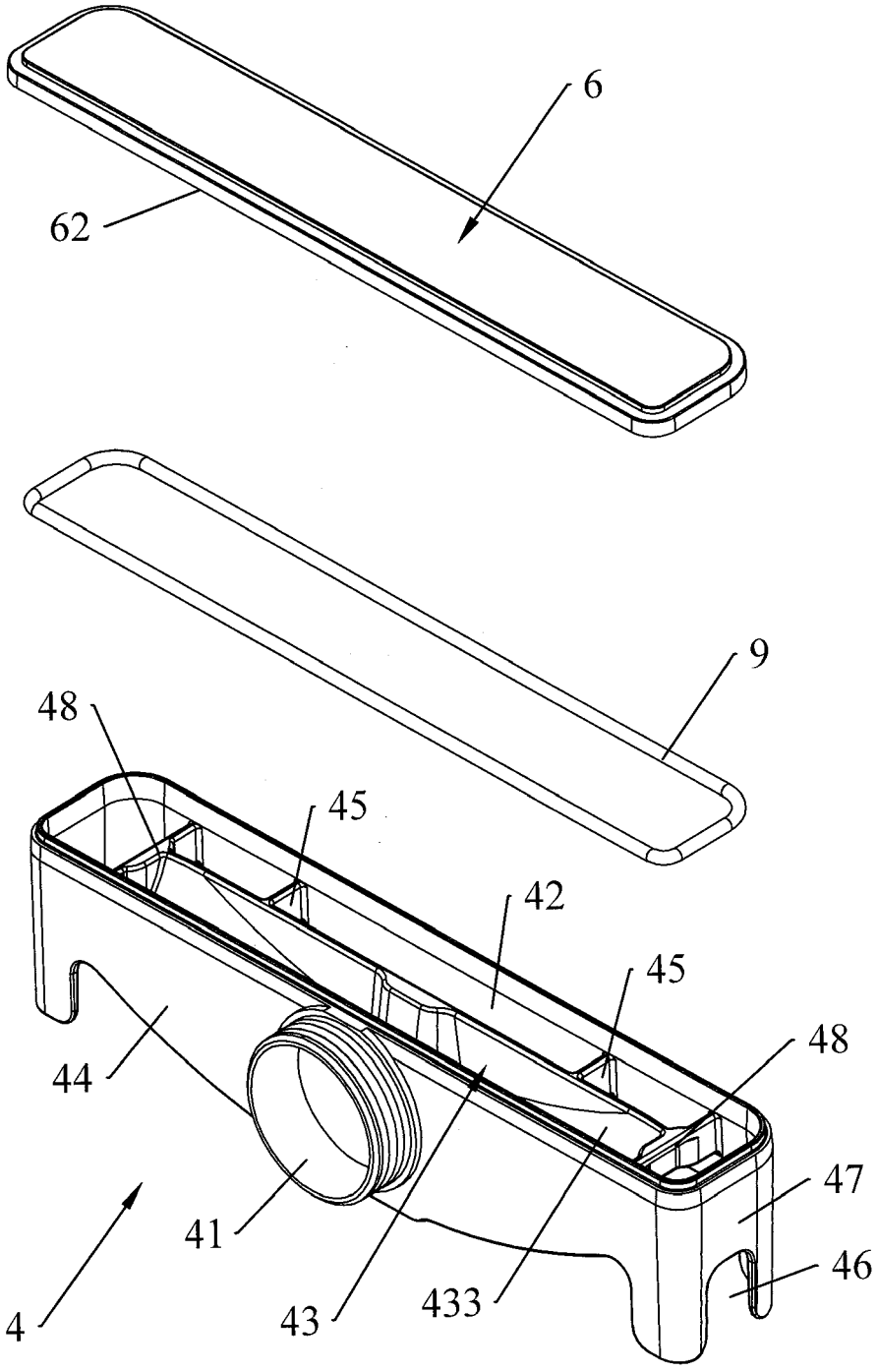

FIG.11

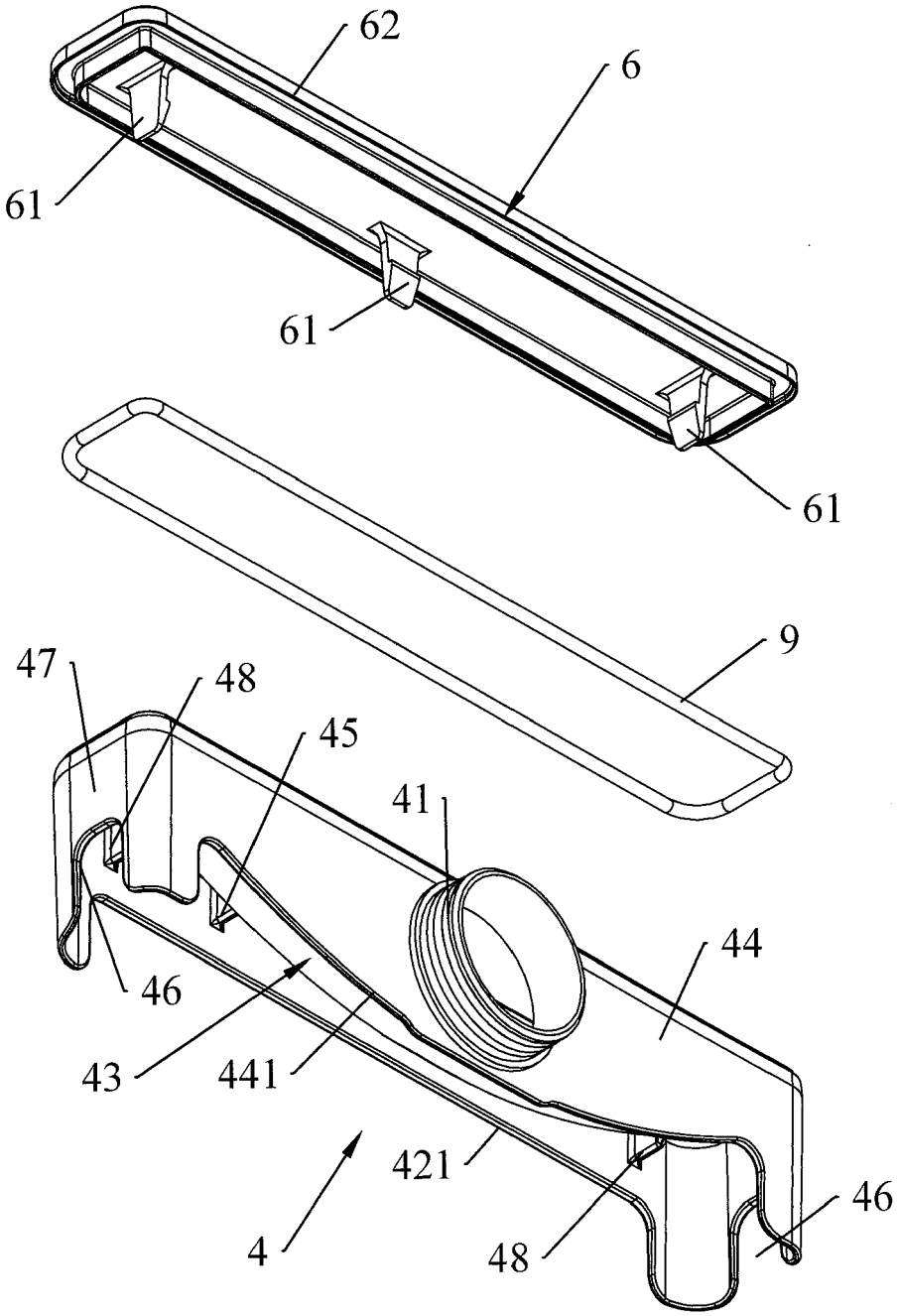

FIG.12

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EUROPEAN SEARCH REPORT

Application Number
EP 21 20 2805

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)
E03C
E03F

1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	7 March 2022	Isailovski, Marko

CATEGORY OF CITED DOCUMENTS

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07-03-2022

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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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