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(54) **CUP DEVICE FOR SUPPORTING A HEADED LIFTING STUD IN A CONCRETE PRODUCT**

(57) Described is a cup device (1) for supporting a headed lifting stud (2) in a concrete product (3). The cup device (1) comprises a cup member (4) configured to be cast into the concrete product (3) so that an inner surface (5) of an open top space (6) of the cup member (4) forms a part of an outer surface (7) of the concrete product (3), and a detachably attachable support member (8) configured for keeping the headed lifting stud (2) in position with respect to the inner surface (5). The detachably attachable support member (8) is detachably attachable to the cup member (4) by means of first connection means (12) and detachably attachable to the headed lifting stud (2) by means of second connection means (13). The detachably attachable support member (8) covers the open top space (6) only partly.

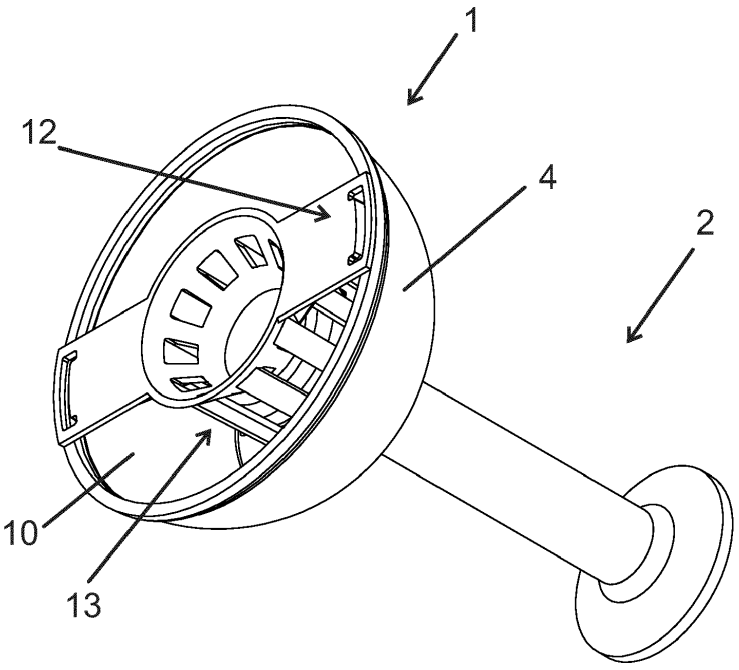

FIG 2

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Description

Field

[0001] The invention relates to a cup device for supporting a headed lifting stud in a concrete product as defined in the preamble of independent claim 1.

[0002] The concrete product can for example be a hollow core concrete slab.

[0003] Concrete products can be provided with headed lifting studs, which are mounted in openings in the upper surface of the concrete product so that the headed stud is fastened vertically in an openings in the upper surface of the concrete product by casting concrete around the headed stud in the opening and so that the vertical stud do not project out of the opening in the upper surface of the concrete product. This can be done by providing a cup member of cup device around the vertical stud at the mouth of the opening in the upper surface of the concrete product so that a head of the vertical headed stud in the opening in the upper surface of the concrete product is in an inner space of an open top member of the cup member at in the upper surface of the concrete product and not cast into concrete. This allows to lift the concrete product from the head of the vertical headed stud by securing a lifting key of a lifting device to the head of the vertical headed stud in the inner space of the open top member of the cup member. Important for safety is however that the headed lifting studs are in a correct position with respect the concrete product to allow for proper connection of the lifting key to the head of the vertical stud.

Objective

[0004] The object is to provide a cup device for supporting a headed lifting stud in a concrete product which has both means for ensuring a correct position of the headed lifting stud in relation to the cup device is achieved when casting the headed lifting stud into the surface of the concrete product and that additionally provides for a possibility to verify that that the correct position of the headed lifting stud in relation to the cup device is achieved for example while the concrete into which the headed stud is partly cast hardens.

Short description

[0005] The cup device for supporting a headed lifting stud in a concrete product is characterized by the definitions of independent claim 1.

[0006] Preferred embodiments of the cup device are defined in the dependent claims.

List of figures

[0007] In the following the cup device will described in more detail by referring to the figures of which

Figure 1 shows in section view a concrete product in the form of a hollow core slab having headed lifting stud partly casted into concrete in the hollow core slab,

Figure 2 shows one embodiment of the cup device having a headed lifting stud arranged thereto,

Figure 3 shows the embodiment of the cup device with the headed lifting stud arranged thereto illustrated in figure 2 as seen from the side,

Figure 4 shows an embodiment of the cup device that is provides with headed lifting stud arranged thereto and that is provided with a detachable attachable lid member configured to fully close the open top space of the cup member of the cup device,

Figure 5 shows the detachable attachable support member of the cup device shown in figure 2 with a headed lifting stud arranged thereto,

Figure 6 shows the embodiment of the cup device with the headed lifting stud arranged thereto illustrated in figure 2 as seen from above,

Figure 7 shows the cup member of the cup device shown in figure 2,

Figure 8 is another view of the cup member shown in figure 7,

Figure 9 is another view of the cup member shown in figure 7,

Figures 10 to 12 shows an alternative embodiment of the cup member of the cup device in which alternative embodiment the cup member is in a two-part form comprising a top cup part illustrated in figure 10 and a bottom cup part illustrated in figures 11 and 12,

Figure 13 shows the detachable attachable support member of the cup device shown in figure 2,

Figure 14 is another view of the cup member shown in figure 9,

Figure 15 shows a first embodiment of a detachable attachable lid member that can be arranged to close the open top space of the cup member of the cup device,

Figure 16 is another view of the detachable attachable lid member shown in figure 15,

Figure 17 shows a second embodiment of a detachable attachable lid member that can be arranged to close the open top space of the cup member of the cup device,

Figure 18 is another view of the detachable attachable lid member shown in figure 17,

Figure 19 shows a third embodiment of a detachable attachable lid member that can be arranged to close the open top space of the cup member of the cup device,

Figure 20 is another view of the detachable attachable lid member shown in figure 19,

Figure 21 shoes the lid member illustrated in figures 19 and 20 in a state where the lid member is connected to the head of a headed stud,

Figure 22 shows a fourth embodiment of a detach-

able attachable lid member that can be arranged to close the open top space of the cup member of the cup device,

Figure 23 is another view of the detachable attachable lid member shown in figure 22,

Figure 24 shoes the lid member illustrated in figures 22 and 23 in a state where the lid member is connected to the head of a headed stud,

Figure 25 shows a fifth embodiment of a detachable attachable lid member that can be arranged to close the open top space of the cup member of the cup device, and

Figure 26 is another view of the detachable attachable lid member shown in figure 25.

Detailed description

[0008] Next the cup device 1 for supporting a headed lifting stud 2 in a concrete product 3 and some embodiments and variants of the cup device 1 will be described in greater detail.

[0009] The cup device 1 comprises a cup member 4 configured to be cast into the concrete product 3 so that an inner surface 5 of an open top space 6 of the cup member 4 permanently or temporarily forms a part of an outer surface 7 of the concrete product 3 and so that a headed lifting stud 2 to be cast into the concrete product 3, such as into a recess formed in the outer surface 7 of the concrete product 3, projects through an opening 9 in the cup member 4 from concrete of the concrete product 3 into the open top space 6 of the cup member 4. Permanently means in this connection that the cup member 4 will be left in a building structure (not illustrated in the figures) and temporarily means in this connection that the cup member will be removed for example after that the concrete product has been produced by casting or after that the concrete product has been lifted into its mounting position in a building structure.

[0010] The cup device 1 comprises a detachable attachable support member 8 configured for keeping the headed lifting stud 2 in position with respect to the inner surface 5 of the open top space 6 of the cup member 4, wherein the detachable attachable support member 8 is detachable attachable to the cup member 4 by means of first connection means 12 and detachable attachable to the headed lifting stud 2 by means of second connection means 13,

[0011] The detachable attachable support member 8 covering the open top space 6 of the cup member 4 only partly. This provides for the advantage that the position of the headed lifting stud 2 with respect to the inner surface 5 of the open top space 6 of the cup member 4 is visible and can be corrected prior hardening of the concrete of the concrete product 3 into which the headed lifting stud 2 is casted. This promotes safety when lifting the concrete product 3 from the headed lifting stud 2 projecting from the outer surface 7 of the concrete product 3 in recesses in the outer surface 7 of the concrete product 3.

[0012] The cup member 4 functions also as a mold for forming a recess (not marked with a reference numeral) in the outer surface 7 of the concrete product 3 so that the headed lifting stud 2 projects from concrete of the concrete product 3 into the recess, but not out of the recess.

[0013] The inner surface 5 of the cup member 4 can, as illustrated in the figures, be an at least partly spherical inner surface so that the at least partly spherical inner surface is configured to symmetrically surround the headed lifting stud 2.

[0014] The inner surface 5 of the cup member 4 can, as illustrated in the figures, have at least partly the shape of a spherical segment so that the inner surface 5 of the cup member 4 is configured to symmetrically surround the headed lifting stud 2.

[0015] The inner surface 5 of the cup member 4 can, as illustrated in the figures, have at least partly the shape of a hemispherical so that the inner surface 5 of the cup member 4 is configured to symmetrically surround the headed lifting stud 2.

[0016] The detachable attachable support member 8 covers preferably, but not necessarily, the open top space 6 of the cup member 4 only partly by forming at least one sight opening 10 between the inner surface 5 of the cup member 4 and the detachable attachable support member 8, as in the embodiments illustrated in the figures. Alternatively or additionally, the detachable attachable support member 8 can cover the open top space 6 of the cup member 4 only partly by having at least one sight opening 10 formed in the detachable attachable support member 8.

[0017] The cup device 1 can comprise a detachable attachable lid member 11 configure to fully close the open top space 6 of the cup member 4 so that the detachable attachable support member 8 is between the detachable attachable lid member 11 and the inner surface 5 of the cup, when the detachable attachable support member 8 is detachable attached to the cup member 4 by means of said first connection means 12 and detachable attached to the headed lifting stud 2 by means of said second connection means 13. Alternatively or additionally, the cup device 1 can comprise a detachable attachable lid member 11 configured to fully close the open top space 6 of the cup member 4, when the detachable attachable support member 8 is removed Both alternatives provide for protection of the heads lifting stud 2 during transport and storage of a concrete product 3 provided with headed lifting studs 2 casted into the concrete product 3 by using the cup device 1. The detachable attachable lid member 11 is preferably, but not necessarily, made plastic or polymer such as of thermoplastic to make it more durable and re-usable. Such detachable attachable lid member 11 can be arranged to be detachable attachable to at least one of the detachable attachable support member 8 and the cup member 4. The detachable attachable lid member 11 can, as illustrated in fig-

ures 15 to 18, comprise third connection means 26 in the form of a surrounding edge configured to co-operate with a circumferential edge 23 provided at a circumferential edge ring 24 of the cup member 4. The detachable attachable lid member 11 can, as illustrated in figures 17 and 18, comprise abutment means 27 configured to be in contact with the detachable attachable support member 8 when both the detachable attachable lid member 11 and the detachable attachable support member 8 are detachable attached to the cup member 4. In such embodiment, the detachable attachable lid member 11 provides additional support for the detachable attachable support member 8. Use of such detachable lid members 11 allows also to cast the concrete product 3 so that the cup devices 1 with headed lifting studs 2 arranged thereto are prior casting of concrete into the casting mold (not shown in the figures) supported by the lid members 11 on the bottom (not shown in the figures) of the casting mold so that the headed lifting studs 2 project perpendicularly upwards from the bottom of the casting mold into the casting space of the casting mold. Alternatively or additionally, the detachable attachable lid member 11 can be configured to cooperate with the headed lifting stud 2 so that the detachable attachable lid member 11 can be detachable attached to the headed lifting stud 2. An advantage of this is that in such case, the detachable attachable lid member 11 can in such case protect the recess in the outer surface 7 of the concrete product 3 and/or the headed lifting stud 2 also in a situation where the cup member 4 and the detachable attachable support member 8 is removed from the concrete product 7 for example after that the concrete of the concrete product 3 has hardened.

[0018] The cup member 4 is preferably, but not necessarily, made of plastic or polymer such as of thermoplastic. An advantage of this is that the original shape of the cup member 4 remains also during vibrating of the concrete: result is a correct shape of the open top space 6 of the cup, which promotes correct positioning of the headed lifting stud 2 with respect to the open top space 6 of the cup. Thermoplastic is also durable, which enables to re-use the cup member 4 in case the cup member 4 is removed from the concrete product 3 for example once the concrete product 3 has been lifted by using the headed lifting studs 2 to its final mounting place in a building construction.

[0019] The detachable attachable support member 8 is preferably, but not necessarily, made of plastic or polymer such as thermoplastic. An advantage of this is that the original shape of the detachable attachable support member 8 remains also during vibrating of the concrete and the result is a correct shape of the open top space 6 of the cup, which promotes correct positioning of the headed lifting stud 2 with respect to the open top space 6 of the cup. Thermoplastic is also durable, which enables to re-use the detachable attachable support member 8 for example once the concrete of concrete product 3 into which the headed lifting studs 2 has been casted by using the cup device 1 has been cured.

[0020] The first connection means 12 by means of which the detachable attachable support member 8 is attached to the cup member 4 comprises preferably, but not necessarily, as illustrated in the figures, at least one a snap retainer 14 for detachable attaching the detachable attachable support member 8 to the cup member 4.

[0021] The second connection means 13 by means of which the detachable attachable support member 8 is attached to the headed lifting stud 2 comprises as illustrated in the figures, a plurality of first deflectable leg means 15 defining a first blind tubular inner space 16 therebetween, wherein at least some of the first deflectable leg means 15 having a first projection 17 at the end of the first deflectable leg means 15 projecting into the first blind tubular inner space 16, and wherein the first blind tubular inner space 16 having a first abutment surface 18 forming a bottom of the first blind tubular inner space 16, wherein the first blind tubular space 16 is configured to receive a head of a headed lifting stud 2 so that said plurality of first deflectable leg means 15 press against a circumferential outer surface of the head of a headed lifting stud 2 while the head of a headed lifting stud 2 is pressed between the first abutment surface 18 and the first projections 17 projecting from the first deflectable leg means 15. An advantage of this is that the headed lifting stud 2 will be both axially and radially releasable locked into position with respect to the detachable attachable support member 8. Because the headed lifting stud 2 will be both axially and radially releasable locked into position with respect to the detachable attachable support member 8, it is possible to use the detachable attachable support member 8 as a handle for the headed lifting stud 2 when placing and detachable attaching the headed lifting stud 2 into position with respect to the inner surface 5 of the cup member 4.

[0022] Said plurality of first deflectable leg means 15 of the second connection means 13 extend from a central portion 19, which can be in the form of a central circular portion, of the detachable attachable support member 8, and two fastening portions 20 extend diametrically from the central portion 19, so that each fastening portion 20 is provided with a snap retainer 14 of the first connection means 12 for detachable attaching the detachable attachable support member 8 to a circumferential edge 23 of the cup member 4. In the embodiment illustrated in the figures the central circular portion 19 has partly the shape of a truncated cone 25 so that a bottom of the central circular portion 19 forms the first abutment surface 18. In the embodiment illustrated in the figures, the cup member 4 comprises a circular edge ring 24 and the circumferential edge 23 of the cup member 4 is provided at the circular edge ring 24.

[0023] The opening 9 of the cup member 4 of the cup device 1 is preferably, but not necessarily, a central opening provided with a slit configuration 21 extending from the opening 9 and disposed around the opening 9. Such slit configuration 21 extending from the opening 9 and

disposed around the opening 9 allows to push a head of the heads lifting stud 2 through the opening 9 even if the cross-section of the opening 9 is smaller than the cross-section of a head of the headed lifting stud 2.

[0024] The cup member 4 of the cup decide 1 can for example have an opening 9 in the form of a central opening and have a slit configuration 21 consisting of a plurality of slits 22 each extending from the central opening to form a symmetrical slit configuration 21 around the opening 9 having independently movable flexible flaps 34 between adjacent slits 22. Such slit configuration 21 extending from the opening 9 and disposed around the opening 9 allows to push a head of the heads lifting stud 2 through the opening 9 even if the cross-section of the opening 9 is smaller than the cross-section of a head of the headed lifting stud 2.

[0025] Alternatively the cup member 4, can as illustrated in figures 10 to 12, be in a two-part form so that the cup member 4 comprising a top cup part 28 and a bottom cup part 29. In this alternative embodiment of the cup member 4, the top cup part 28 is detachable attachable to the bottom cup part 29. In this alternative embodiment of the cup member 4, the opening 9 in the cup member 4 is formed by a first opening section 30 in the top cup part 28 and by a second opening section 31 in the bottom cup part 29. In this alternative embodiment of the cup member 4, the detachable attachable support member 8 is detachable attachable to the top cup part 28 of the cup member 4 by means of the first connection means 12. In this alternative embodiment of the cup member 4, the second opening section 31 in the bottom cup part 29 can be provided with a slit configuration 21 extending from the second opening section 31 and comprising slits 22 disposed around the second opening section 31 so that independently movable flexible flaps 34 are provided between adjacent slits 22. In this alternative embodiment of the cup part 4, the bottom cup part 29 can comprise a split 32 extending between the second opening section 31 and an outer edge 33 of the bottom cup part 29.

[0026] The cup device can, as mentioned, be provided with a detachable attachable lid member 11 configured to fully close the open top space 6 of the cup member 4. In the third embodiment of the lid member illustrated in figures 19 to 21, the detachable attachable lid member 11 comprises fourth connection means 35 comprising a plurality of second deflectable leg means 37 defining a second blind tubular inner space 38 therebetween. At least some of the second deflectable leg means 37 have a second projection 39 at the end of the second deflectable leg means 37 projecting into the second tubular inner space 38. The second blind tubular inner space 38 has a second abutment surface 40 forming a bottom of the second blind tubular inner space 38. In this third embodiment of the lid member illustrated in figures 19 to 21, the second blind tubular inner space 38 is configured to receive a head of a headed lifting stud 2 so that said plurality of second deflectable leg means 37 press against a circumferential outer surface of the head of the headed lifting stud 2 while the head of the headed lifting stud 2 is pressed between the second abutment surface 40 and the second projections 39 projecting from the second deflectable leg means 37, when the detachable attachable support member 8 is detached from the cup member 4 and detached from the head of the headed lifting stud 2. The advantage of this is that the detachable attachable lid member 11 can form protection for the head of the headed lifting stud 2 and prevent water and debris from entering the recess around head of the headed lifting stud 2 also when at least one of the cup member 4 and the detachable attachable support member 8 is removed from the concrete product 3 and when it would be impossible to attach a detachable attachable lid member 11 to one of the cup member 4 and the detachable attachable support member 8. The detachable attachable lid member 11 is preferably, but not necessarily, made of plastic or polymer such as of thermoplastic. The detachable attachable lid member 11 is preferably, but not necessarily, in the form of a circular disk having a diameter that is greater than the largest diameter of the recess around head of the headed lifting stud so as to provide adequate protection for the recess in the surface of the concrete product 3 around the head of the headed lifting stud 2. The detachable attachable lid member 11 is preferably, not necessarily, as illustrated in figures 22 to 26 provided with a flexible ring member 41 of elastic material surrounding the fourth connection means 35. The flexible ring member 41 is dimensioned and designed to be placed between the detachable attachable lid member 11 and the concrete product 3 when the detachable attachable lid member 11 is detachable attached to the head of a headed lifting stud 2. A purpose of the flexible ring member 41 is to protect the detachable attachable lid member 11 from being crushed against the hard surface of the concrete product3 if someone for example steps on the detachable attachable lid member 11. The second abutment surface 40 is preferably, but not necessarily, provided with a flexible member 42 of elastic material. A purpose of the flexible ring member 41 is to protect the detachable attachable lid member 11 from being crushed against the hard surface of the head of the headed lifting stud if someone for example steps on the detachable attachable lid member 11.

[0027] It is apparent to a person skilled in the art that as technology advanced, the basic idea of the invention can be implemented in various ways. The invention and its embodiments are therefore not restricted to the above examples, but they may vary within the scope of the claims.

Claims

1. A cup device (1) for supporting a headed lifting stud (2) in a concrete product (3), wherein the cup device (1) comprising
   a cup member (4) configured to be cast into the con-

crete product (3) so that an inner surface (5) of an open top space (6) of the cup member (4) forms a part of an outer surface (7) of the concrete product (3) and so that a headed lifting stud (2) to be cast into the concrete product (3) projects through an opening (9) in the cup member (4) from concrete of the concrete product (3) into the open top space (6) of the cup member (4), and
a detachable attachable support member (8) configured for keeping the headed lifting stud (2) in position with respect to the inner surface (5) of the open top space (6) of the cup member (4), wherein the detachable attachable support member (8) is detachable attachable to the cup member (4) by means of first connection means (12) and detachable attachable to the headed lifting stud (2) by means of second connection means (13),
characterized
by the detachable attachable support member (8) covering the open top space (6) of the cup member (4) only partly
by the second connection means (13) comprising a plurality of first deflectable leg means (15) defining a first blind tubular inner space (16) therebetween, wherein at least some of the first deflectable leg means (15) having a first projection (17) at the end of the first deflectable leg means (15) projecting into the first blind tubular inner space (16), and wherein the first blind tubular inner space (16) having a first abutment surface (18) forming a bottom of the first blind tubular inner space (16),
by the first blind tubular space (16) is configured to receive a head of a headed lifting stud (2) so that said plurality of first deflectable leg means (15) press against a circumferential outer surface of the head of a headed lifting stud (2) while the head of a headed lifting stud (2) is pressed between the first abutment surface (18) and the first projections (17) projecting from the first deflectable leg means (15),
by said plurality of first deflectable leg means (15) extend from a central circular portion (19) of the detachable attachable support member (8), and
by two fastening portions (20) extend diametrically from the central circular portion (19), each fastening portion (20) being provided with a snap retainer (14) of the first connection means (12) for detachable attaching the detachable attachable support member (8) to a circumferential edge (23) of the cup member (4).

2. The cup device (1) according to claim 1, **characterized**
by the inner surface (5) of the cup member (4) being an at least partly spherical inner surface, and
by the at least partly spherical inner surface being configured to symmetrically surround the headed lifting stud (2).

3. The cup device (1) according to claim 1 or 2, **characterized**
by the detachable attachable support member (8) covering the open top space (6) of the cup member (4) only partly by forming at least one sight opening (10) between the inner surface (5) of the cup member (4) and the detachable attachable support member (8).

4. The cup device (1) according to any of the claims 1 to 3, **characterized**
by the detachable attachable support member (8) covering the open top space (6) of the cup member (4) only partly by having at least one sight opening (10) formed in the detachable attachable support member (8).

5. The cup device (1) according to any of the claims 1 to 4, **characterized**
by a detachable attachable lid member (11) configure to fully close the open top space (6) of the cup member (4) so that the detachable attachable support member (8) is between the detachable attachable lid member (11) and the inner surface (5) of the cup, when the detachable attachable support member (8) is detachable attached to the cup member (4) by means of said first connection means (12) and detachable attached to the headed lifting stud (2) by means of said second connection means (13).

6. The cup device (1) according to claim 5, **characterized**
by the detachable attachable lid member (11) being made of plastic or polymer such as of thermoplastic.

7. The cup device (1) according to claim 5 or 6, **characterized**
by the detachable attachable lid member (11) comprising third connection means (26) in the form of a surrounding edge configured to co-operate with a circumferential edge (23) provided at a circumferential edge ring (24) of the cup member (4).

8. The cup device (1) according to any of the claims 5 to 7, **characterized**
by the detachable attachable lid member (11) comprising abutment means (27) configured to be in contact with the detachable attachable support member (8) when both the detachable attachable lid member (11) and the detachable attachable support member (8) are detachable attached to the cup member (4).

9. The cup device (1) according to any of the claims 1 to 4, **characterized**
by a detachable attachable lid member (11) configured to fully close the open top space (6) of the cup member (4),
by the detachable attachable lid member (11) com-

prises fourth connection means (35) comprising a plurality of second deflectable leg means (37) defining a second blind tubular inner space (38) therebetween, wherein at least some of the second deflectable leg means (37) having a second projection (39) at the end of the second deflectable leg means (37) projecting into the second tubular inner space (38), and wherein the second blind tubular inner space (38) having a second abutment surface (40) forming a bottom of the second blind tubular inner space (38), and
by the second blind tubular inner space (38) is configured to receive a head of a headed lifting stud (2) so that said plurality of second deflectable leg means (37) press against a circumferential outer surface of the head of the headed lifting stud (2) while the head of the headed lifting stud (2) is pressed between the second abutment surface (40) and the second projections (39) projecting from the second deflectable leg means (37), when the detachable attachable support member (8) is detached from the cup member (4) and detached from the head of the headed lifting stud (2).

10. The cup device (1) according to claim 9, **characterized**
by the detachable attachable lid member (11) being made of plastic or polymer such as of thermoplastic.

11. The cup device (1) according to claim 9 or 10, **characterized**
by the detachable attachable lid member (11) being provided with a flexible ring member (41) of elastic material, and
by the flexible ring member (41) surrounding the fourth connection means (35).

12. The cup device (1) according to any of the claims 9 to 11, **characterized**
by the second abutment surface (40) being provided with a flexible member (42) of elastic material.

13. The cup device (1) according to any of the claims 1 to 12, **characterized**
by the cup member (4) being made of plastic or polymer such as of thermoplastic.

14. The cup device (1) according to any of the claims 1 to 13, **characterized**
by the detachable attachable support member (8) being made of plastic or polymer such as of thermoplastic.

15. The cup device (1) according to any of the claims 1 to 14, **characterized**
by the first connection means (12) comprising at least one a snap retainer (14) for detachable attaching the detachable attachable support member (8) to the cup member (4).

16. The cup device (1) according to any of the claims 1 to 15, **characterized**
by the opening (9) in the cup member (4) being a central opening provided with a slit configuration (21) extending from the opening (9) and comprising slits (22) disposed around the opening (9).

17. The cup device (1) according to any of the claims 1 to 16, **characterized**
by the cup member (4) being in a two-part form comprising a top cup part (28) and a bottom cup part (29), by the top cup part (28) being detachable attachable to the bottom cup part (29),
by the opening (9) in the cup member (4) being formed by a first opening section (30) in the top cup part (28) and by a second opening section (31) in the bottom cup part (29), and
by the detachable attachable support member (8) being detachable attachable to the top cup part (28) of the cup member (4) by means of the first connection means (12).

18. The cup device (1) according to claim 17, **characterized**
by the second opening section (31) in the bottom cup part (29) being provided with a slit configuration (21) extending from the second opening section (31) and comprising slits (22) disposed around the second opening section (31), and
by the bottom cup part (29) comprising a split (32) extending between the second opening section (31) and an outer edge (33) of the bottom cup part (29).

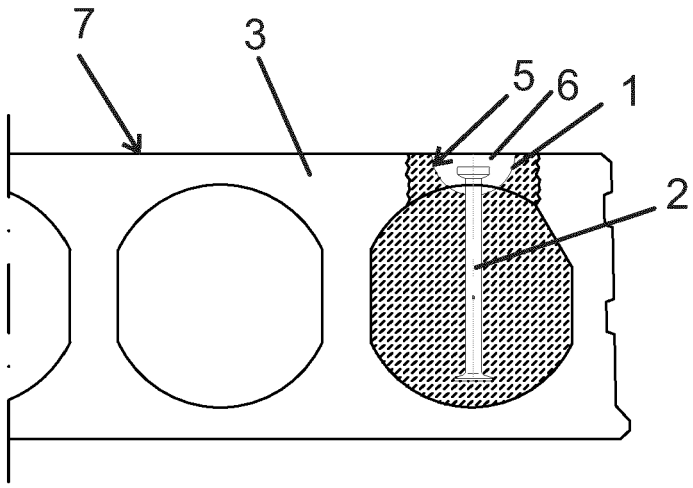

FIG 1

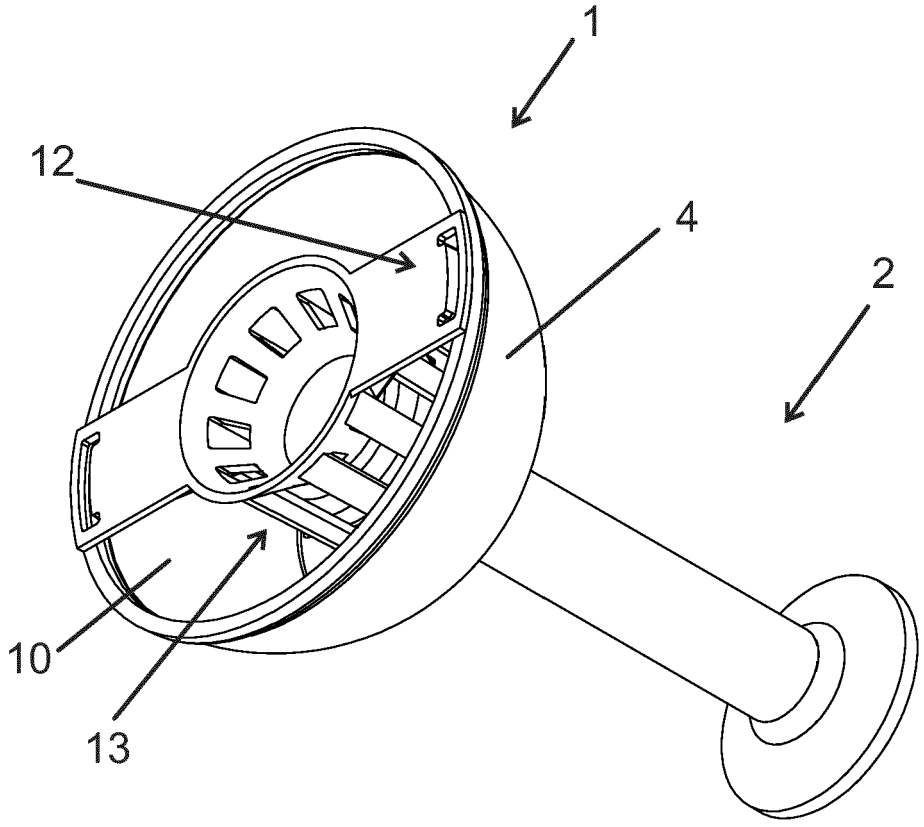

FIG 2

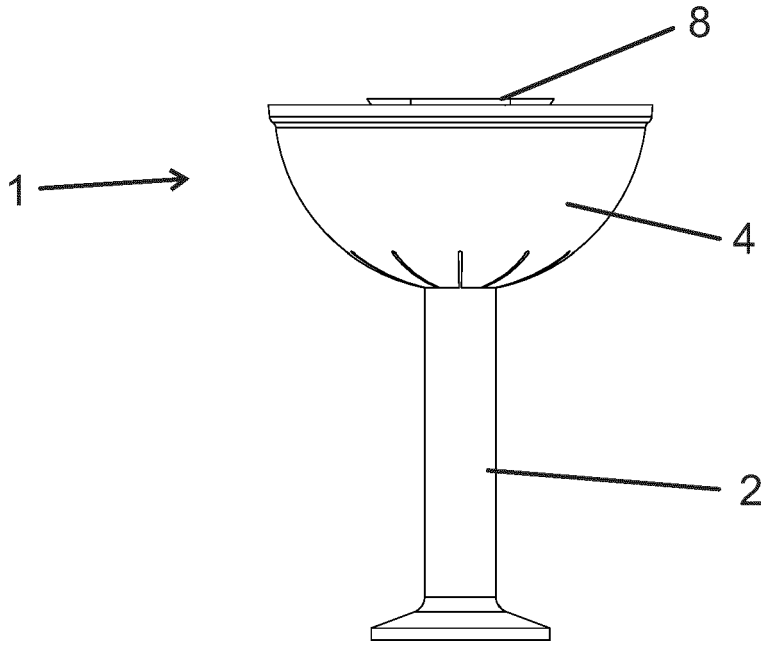

FIG 3

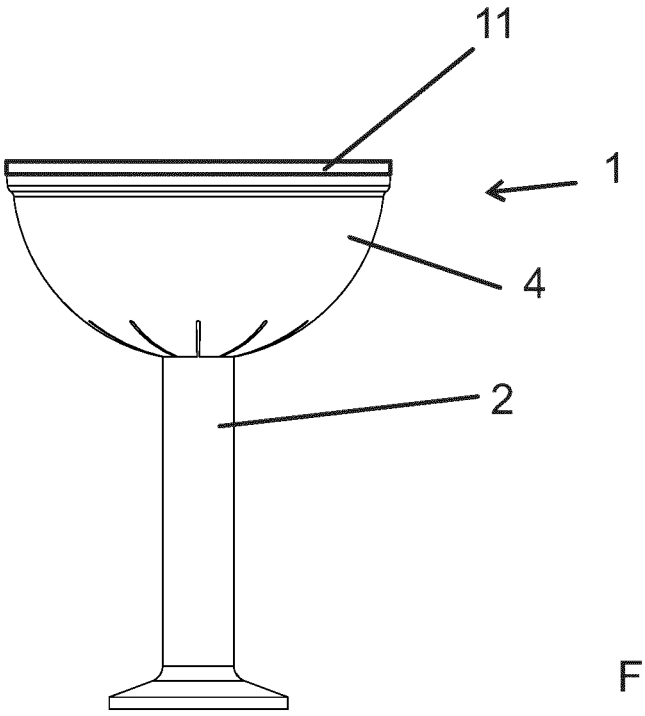

FIG 4

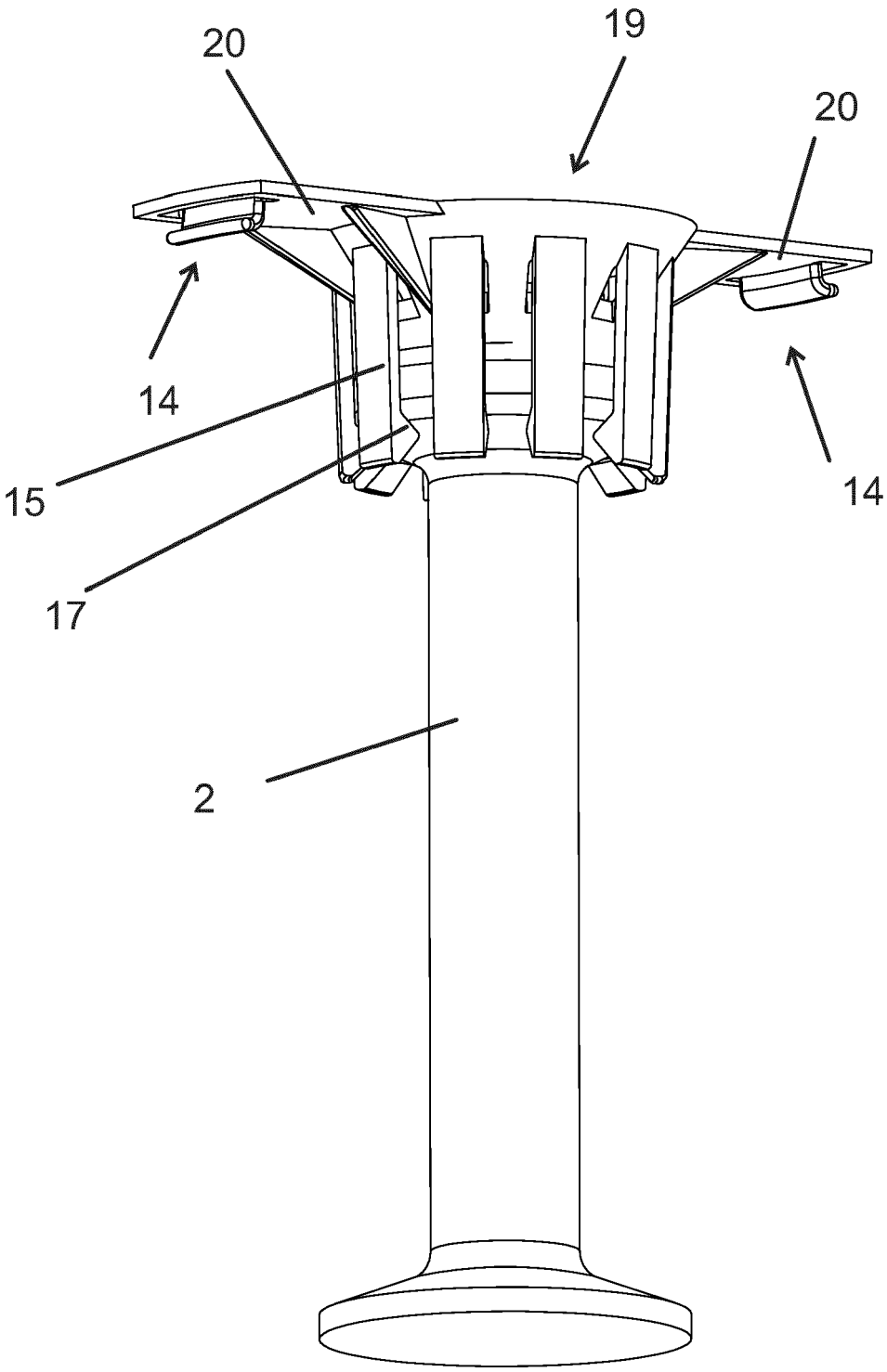

FIG 5

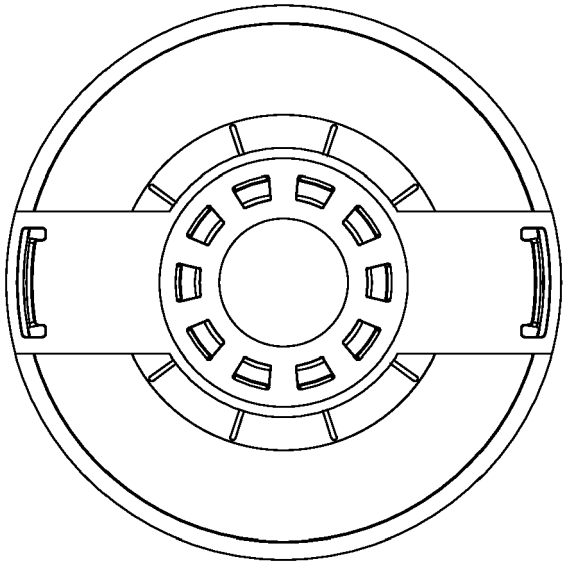

FIG 6

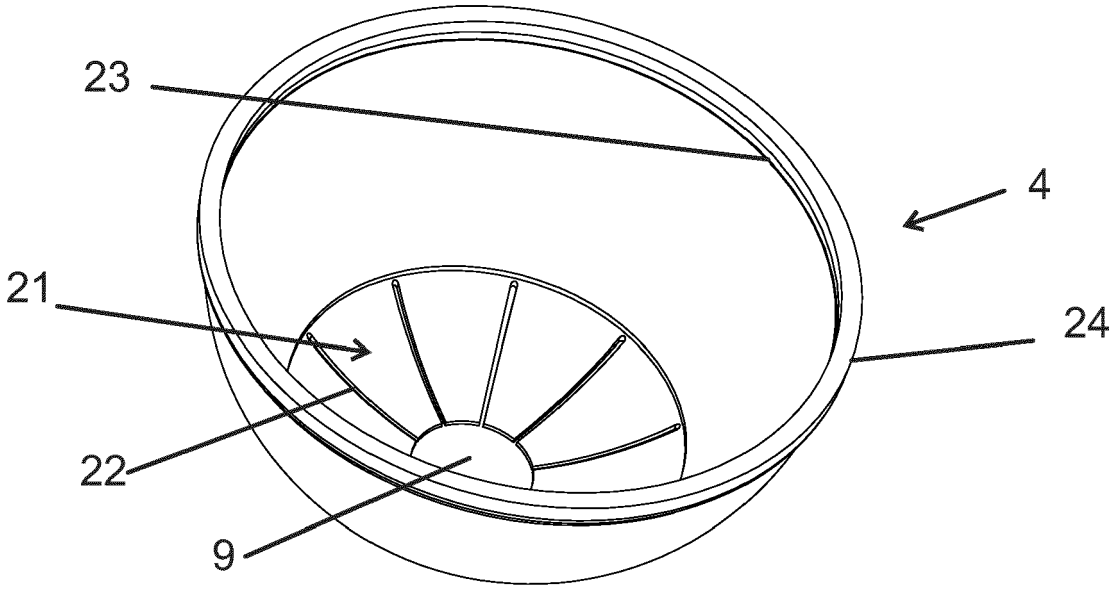

FIG 7

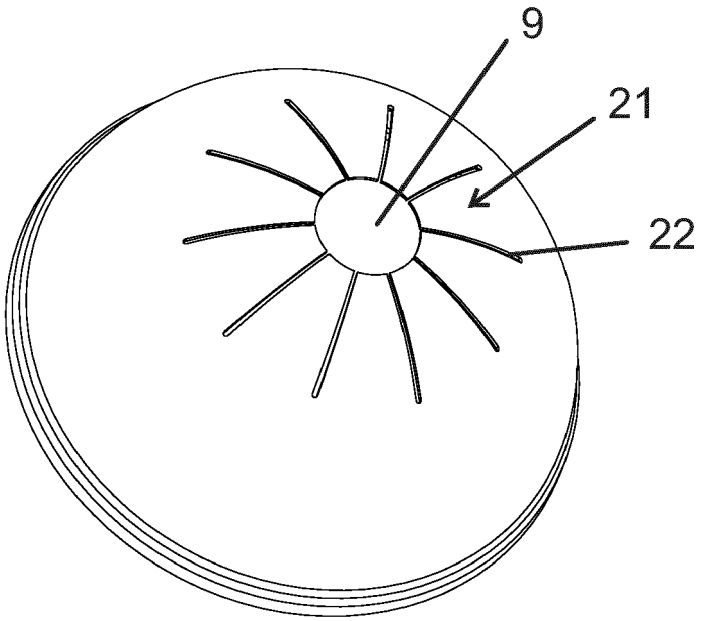

FIG 8

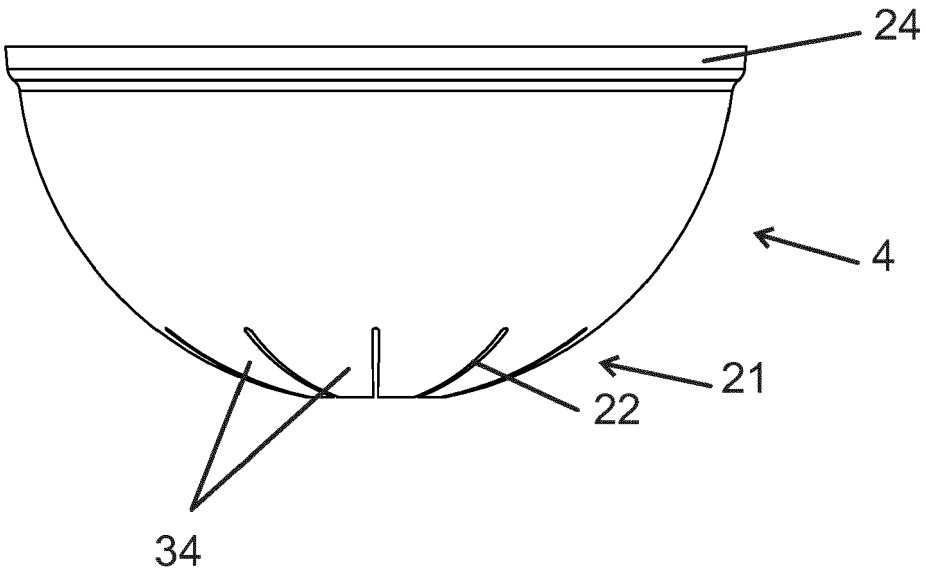

FIG 9

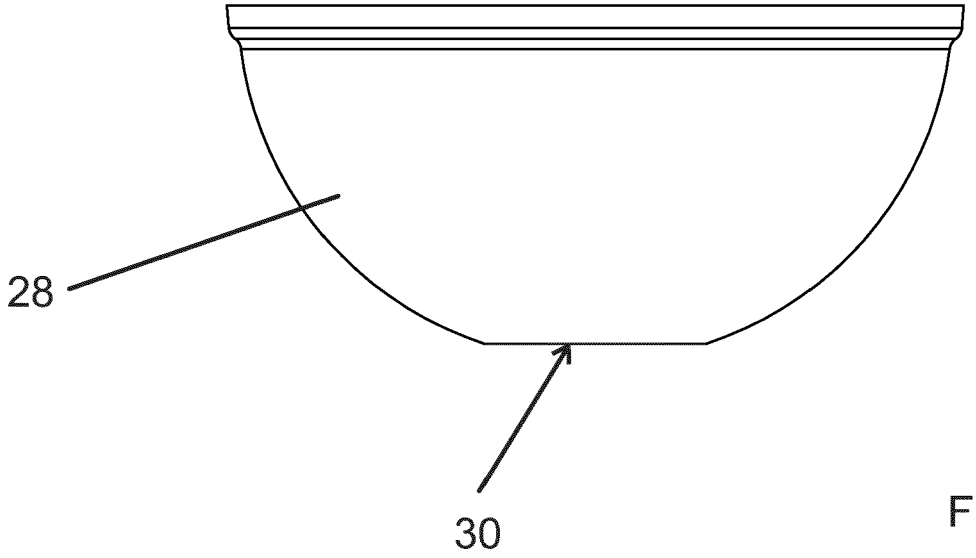

FIG 10

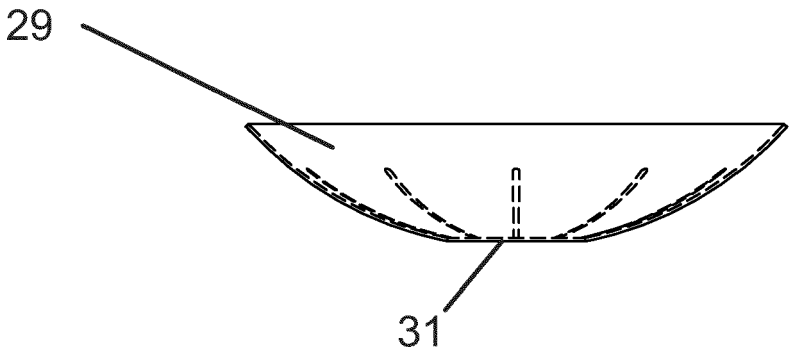

FIG 11

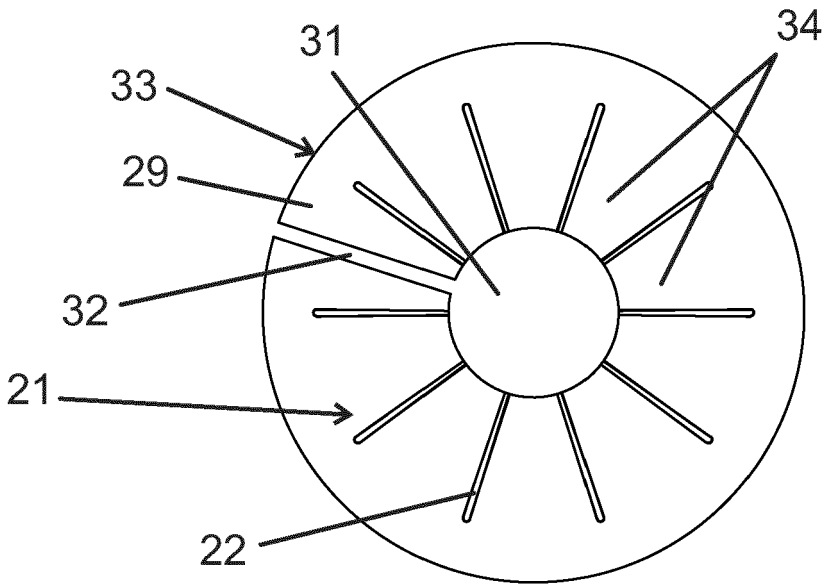

FIG 12

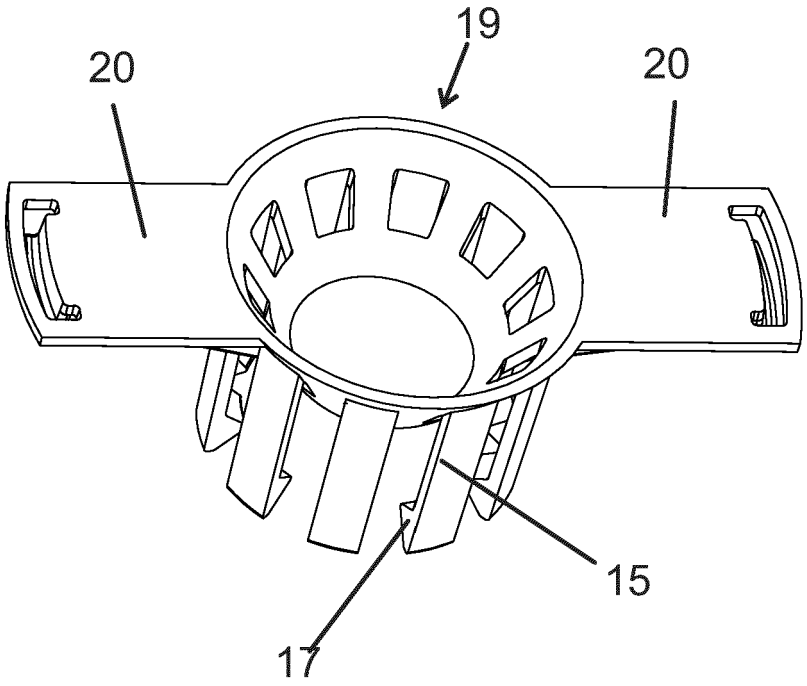

FIG 13

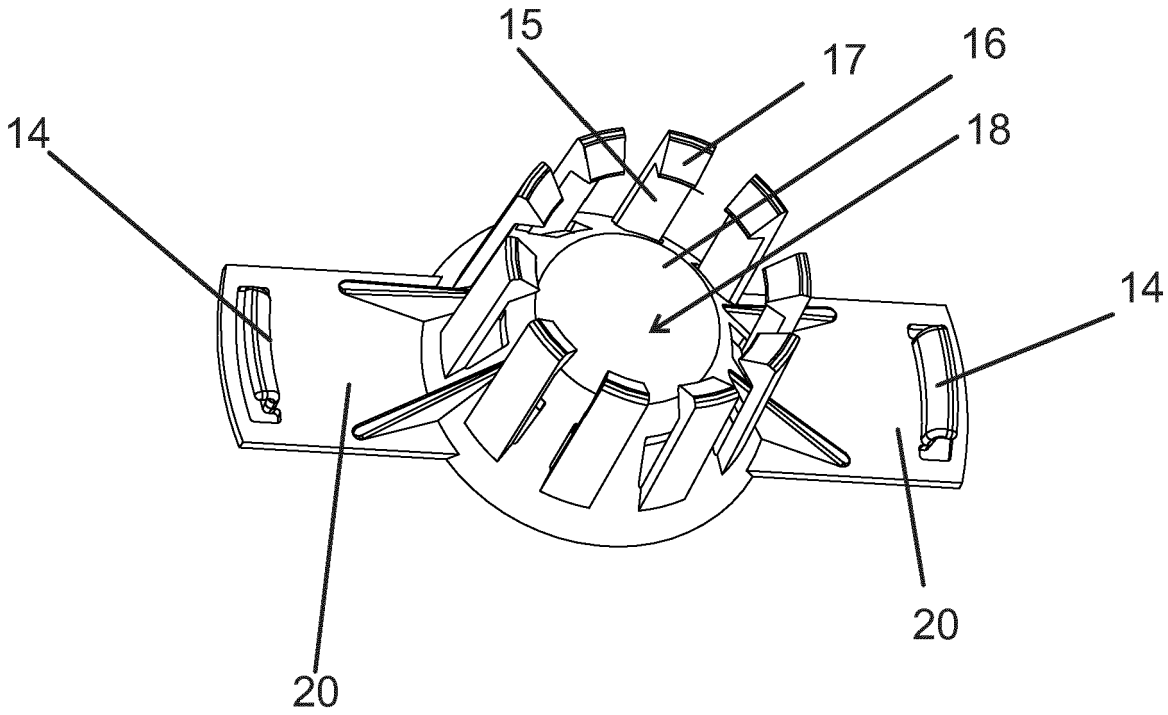

FIG 14

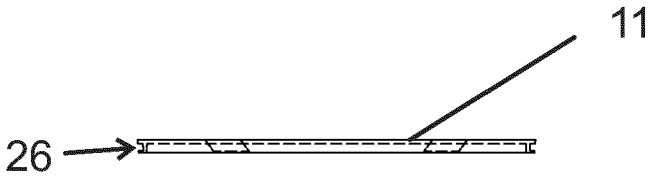

FIG 15

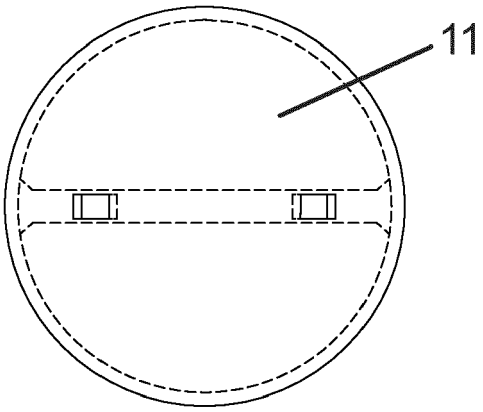

FIG 16

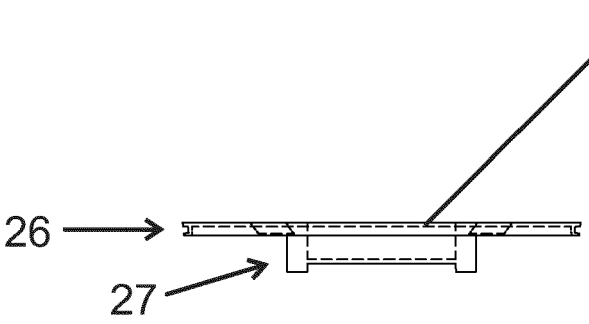

FIG 17

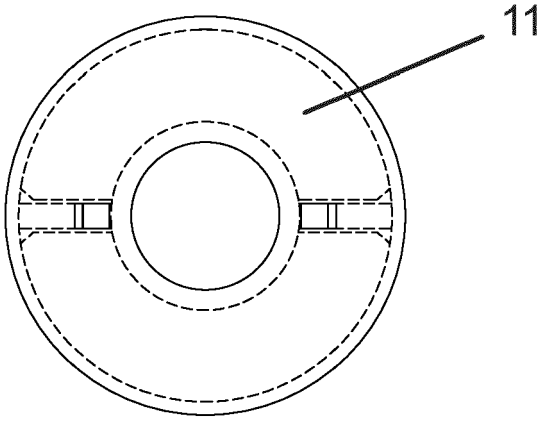

FIG 18

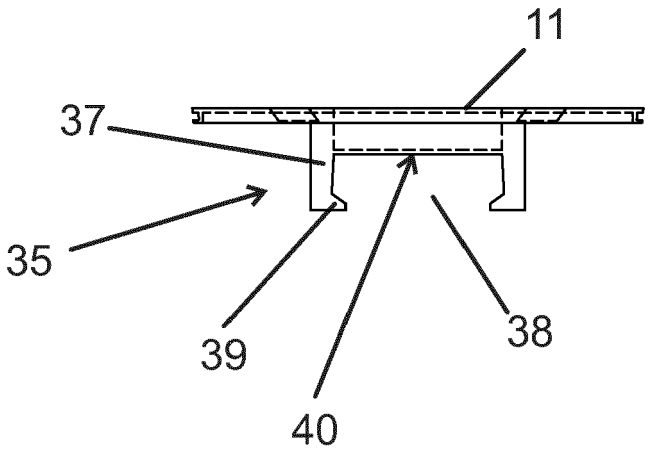

FIG 19

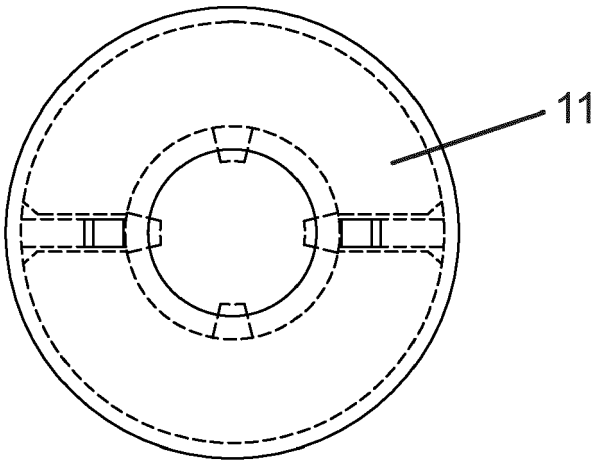

FIG 20

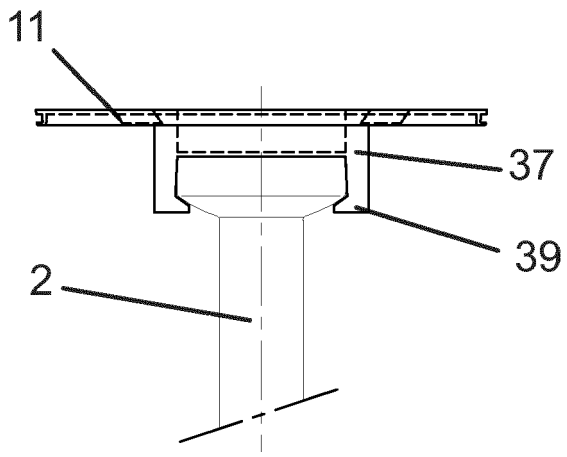

FIG 21

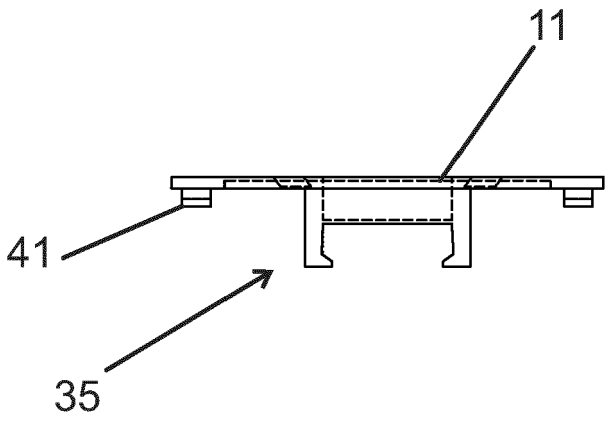

FIG 22

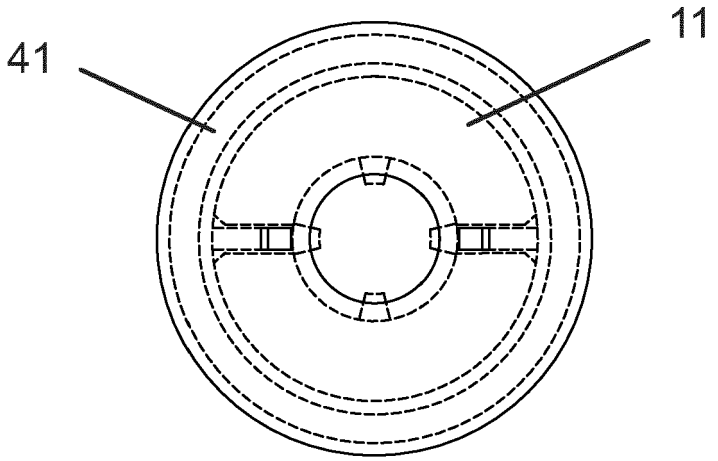

FIG 23

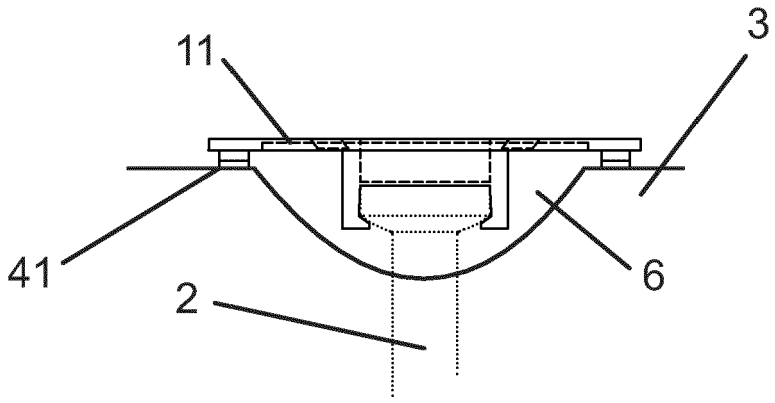

FIG 24

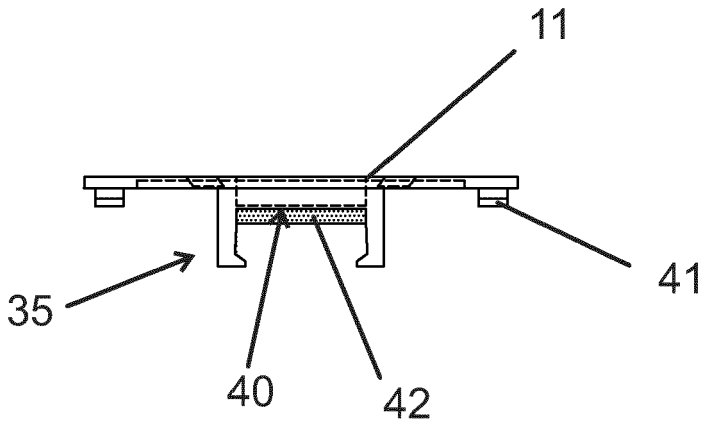

FIG 25

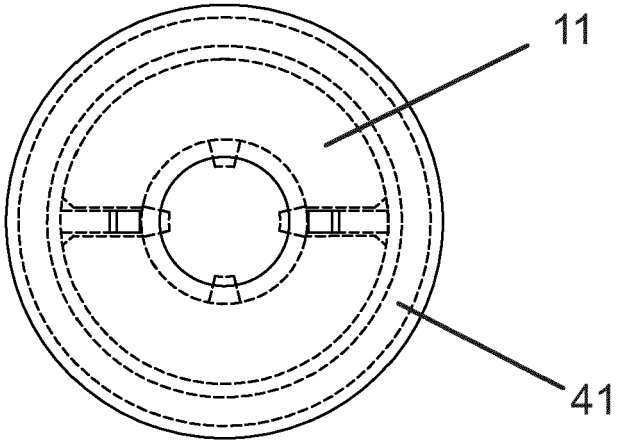

FIG 26