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(54) Title: PANEL MOUNT(S), PANEL SYSTEM AND METHODS OF PREFABRICATING AND MOUNTING A PANEL

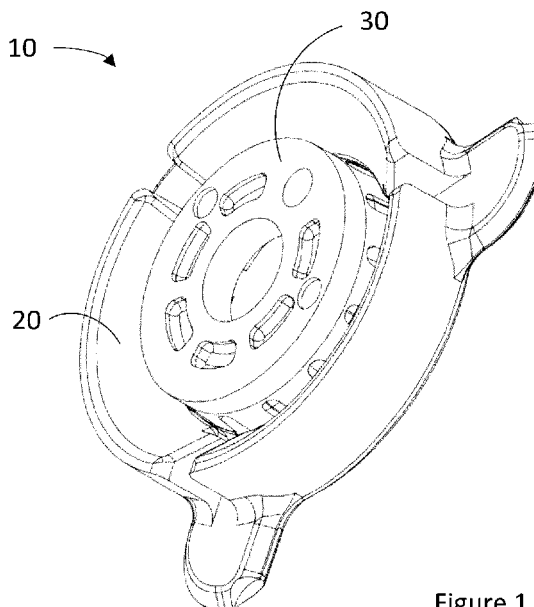


Figure 1

(57) Abstract: A panel mount for securing a panel to a support substrate such as a wall or ceiling. The panel mount includes a receiving part arranged to secure flush or below a mounting face of a panel, and a receivable part arranged to secure to a substrate and to the receiving part. The receivable part is arranged to be removably received at least partially within the receiving part. There is also a panel system and methods of prefabricating and mounting a panel with the panel mount.



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**Panel Mount(s), Panel System and Methods of Prefabricating and Mounting a Panel**Field of the Invention

The present invention relates to panel mounts for mounting decorative or functional panels to supporting substrates. The invention also relates to decorative or functional panel systems, and to methods of prefabricating and mounting decorative or functional panels.

Background to the Invention

One approach to fixing decorative or functional panels to substrates such as walls and ceilings requires using smelly contact adhesive applied to both the panel and the substrate. An installer in some cases must wait for the adhesive to tack-off, then lift the panel into place, carefully position the panel and press it firmly against the substrate to ensure good bond contact. This glue method has several disadvantages including one of misalignment. Once the adhesive surfaces make the slightest of contact they can be difficult to separate without damaging the panel. Further disadvantages include that the security of the connection can fail or deteriorate over time, the glues used are largely solvent based so ventilation and PPE is required, the panel cannot easily be removed and reinstated and removal damages the supporting substrate, and at end of life the panel cannot easily be recycled or reused. Other mounting methods include inserting mechanical fasteners through the panel which can affect the aesthetic or functional characteristics of the panel, or using fixing brackets which leave a gap between the panel and wall and prevent prefabricated panels from being conveniently stacked for transportation.

It is one object of the present invention to provide a panel mount, a panel system and methods which ameliorate the above disadvantages. It is a second object of the present invention to provide a panel mount, a panel system and methods which provide the public with a useful alternative to mounts, panel systems and methods known hitherto.

### Summary of the Invention

According to a first aspect of the invention there is provided a panel mount for securing a panel to a support substrate such as a wall or ceiling. The panel mount includes a receiving part arranged to secure flush or below a mounting face of a panel, and a receivable part arranged to secure to a substrate and to the receiving part. The receivable part is arranged to be removably received at least partially within the receiving part.

According to a second aspect of the invention there is provided a panel system for securing to a wall or ceiling including a panel and a panel mount. The panel has an operative side and a mounting side. The mounting side is provided with a blind recess for accommodating a receiving part of the panel mount.

According to a third aspect of the invention there is provided a method of mounting a panel to a wall or ceiling, the method includes:

- i) cutting or forming a blind recess in a mounting side of a panel,
- ii) positioning in the recess a receiving part of a panel mount,
- iii) twisting the receiving part to cause slicing wings to slice into the panel,
- iv) securing a receivable part of the panel mount to a wall or ceiling, and
- v) positioning the panel in a desired position and engaging the receiving part with the receivable part to secure the panel in the desired position.

According to a fourth aspect of the invention there is provided a method of prefabricating an acoustic or sound absorbing panel including installing in a panel a first part of a mounting system, stacking a plurality of the prefabricated panels together and then transporting the stacked panels to a location where the panels are to be mounted.

According to a fifth aspect of the invention there is provided a receiving part of a panel mount.

According to a sixth aspect of the invention there is provided a receivable part of a panel mount.

According to a seventh aspect of the invention there is provided a tool having a working end arranged to engage a receiving part of a panel mount to facilitate twisting of the receiving part in a panel.

Further features and aspects of the invention are set forth in one or more of the appended claims.

Yet further aspects of the invention, which should be considered in all its novel aspects, will become apparent to those skilled in the art upon reading of the following description and viewing the attached drawings, which are given by way of example only to illustrate the invention.

#### Brief description of the drawings

A preferred form of the present invention will now be described by way of example only with reference to the accompanying drawings, wherein:

Figure 1 illustrates one example of a panel mount in a connected configuration,

Figure 2 illustrates a receivable part of the panel mount,

Figure 3 illustrates a receiving part of the panel mount,

Figure 4 illustrates a mounting side of a panel with an outline for a receiving part recess cut in the panel,

Figure 5 illustrates the mounting side of the panel with material removed to form a blind recess in the panel,

Figure 6 illustrates a receiving part of the panel mount adjacent the blind recess,

Figure 7 illustrates a receiving part of the panel mount engaged with an insert tool according to another aspect of the invention,

Figure 8 illustrates the receiving part of the panel mount being positioned in the blind recess and twisted using the tool to lock the receiving part with the panel,

Figure 9 illustrates the receiving part installed with the panel below or flush with the mounting surface of the panel,

Figure 10 illustrates a second example of a panel mount in a connected configuration

Figure 11 illustrates a first side of a second example receivable part of a panel mount,

Figure 12 illustrates a first side of a second example receiving part of the panel mount,

Figure 13 illustrates a second side of the second example receivable part of a panel mount,

Figure 14 illustrates a second side of the second example receiving part of the panel mount, and

Figure 15 illustrates a third example receivable part of a panel mount.

### Description of the Invention

In the accompanying drawings there is schematically depicted a panel mount 10 (110) for securing a panel to a support substrate such as a wall or ceiling. The mount 10 (110) includes a receiving part 20 (120) arranged to be secured flush or below a mounting face of a panel, and a receivable part 30 (130) arranged to secure to a substrate and to the receiving part. The receivable part is arranged to be removably received at least partially within the receiving part 20 (120) when the panel is mounted to the substrate. The drawings also depict a panel 40 arranged to accommodate the receiving part 20 (120) of the mount and the receiving part 20 (120) installed with a panel 20.

The invention is suitable for use with a variety of decorative or functional panels. In some examples the invention is used for mounting an acoustic or sound absorbing panel to a wall or ceiling.

### *The Receiving Part*

The receiving part 20 (120) of the mount 10 (110) is arranged to be accommodated within a blind recess 42 cut or formed in a mounting side of a panel 40 and twisted to securely lock within the panel. In one example the receiving part 20 (120) has a generally circular body having a mounting side 22, a receiving side 21 opposite the mounting side and an outer peripheral wall 23. Radial slicing wings 24 extend outwardly from the outer peripheral wall 23. In the illustrated example there are three radially extending slicing wings 24. Other examples may have two or more radially extending slicing wings circumferentially spaced about the outer peripheral wall 23. In some examples there may be two slicing wings 24. In other examples there may be four slicing wings 24. In yet other examples there may be five slicing wings 24. In one example the slicing wings 24 are arranged adjacent an edge of the peripheral wall 23 so as to be flush with the mounting side 22 of the body. In other examples the slicing wings 24 may be positioned to not be flush with the mounting side 22 of the body.

Each slicing wing 24 is provided with a bevelled leading edge 25 for slicing into a panel when the receiving part 20 (120) of the mount is twisted in a first – clockwise in the depicted example – direction (the slicing direction). The bevelled leading edge 25 has a curved planer profile extending from the outer peripheral wall 23 in a curve to adjoin a generally linear trailing edge 25 at a tip. In some examples the slicing wings 24 include a notch 26 in the tip of the trailing edge 25. The notch 26 is preferably in the tip of the slicing wing 24 to assist locking the receiving part 20 (120) from moving in a twisting direction opposite to the slicing direction. In some examples the notch or other perturbation may be elsewhere on the trailing edge 25 to assist with locking the receiving part 20 (120) from moving in a twisting direction opposite to the slicing direction.

On its receiving side 21 the receiving part 20 (120) has a ring-like structure defining a central receiving passage 27. In a preferred example depicted the receiving passage 27 is a blind passage.

In some examples the receiving passage 27 may extend through the body from the receiving side 21 to the mounting side 22. An inner surface 231 of the outer peripheral wall 23 has a chamfered profile extending inwardly from an outer radiused edge 232 of the peripheral wall 23 forming a ringlike body that defines a periphery of the receiving passage. A circumferential engagement channel 28 extends around a base of the inner surface 231 of the peripheral wall 23. The outer radiused edge 232 of the peripheral wall 23 has a larger diameter than the circumferential engagement channel 28 at the base of the inner surface 231, such that the chamfered profile of the inner wall guides the receivable part 30 (130) into the receiving passage 27. .

In preferred examples the receiving part 20 (120) includes one or more radial perturbances 29 that, in combination with the receiving passage, define a tool receptacle arranged to accommodate engagement of a tool 50 for twisting the slicing wings 24 into a panel 40. In the depicted example the perturbances are three radial channels 29 in the receiving side 21 of the body that are engageable by driving ribs of a tool 50 for transferring a twisting force of the tool to the receiving part 20 (120). In some examples the radial channels 29 extend from the inner surface 231 to the outer surface of the peripheral wall 23 to define a break in the wall. In other examples, as depicted in figures 10 to 14, the radial channels 29 interrupt the chamfered inner wall 231 but do not extend through to the outer surface such that outer surface of the peripheral wall 23 is unbroken.

#### *The Receivable part*

A receivable part 30 (130) of the mount 10 (110) is arranged to be secured to a supporting substrate, such as a wall or ceiling, and to be secured with the receiving part 20 (120) to facilitate mounting of a panel to the supporting substrate. In a preferred examples the receivable part 30 (130) includes a base 31 having an aperture 32 for receiving a mechanical fastener to secure the receivable part 30 (130) against a support substrate. An insertion portion 33 extends axially from the periphery of the base 31 and is arranged to be removably received, at least partially, with the receiving passage 27 of the receiving part 20 (120). In the depicted example the insertion portion 33 has a plurality of attachment clips 34 that in a connection configuration are received within the receiving passage 27 of the receiving part 20 (120). In the preferred example the attachment

clips 34 are in the form of resiliently deformable tabs having engagement flanges 35 at their distal end for matting with the engagement channel 28 when the insertion portion 33 is received within the receiving passage 27. In some examples the attachment clips 34 also have a radially protruding rib 36 on an outer face. The engagement flanges 35 are radiused or chamfered to engage with the engagement channel 28 to axially secure the receivable part 30 (130) with the receiving part 20 (120). The ribs 36 are arranged to engage the peripheral wall of the receiving passage 27 to laterally (or radially) secure the receivable part 30 (130) with the receiving part 20 (120). In other examples there are no radially protruding rib 36.

In the depicted examples the insertion portion 33 includes a plurality of circumferentially spaced attachment clips 34 extending from a periphery of the base 31. A plurality of relief openings 37 are provided between each of the plurality of circumferentially spaced attachment clips 34. In other examples there may be any practical number of attachment clips such as two or more attachment clips extending from a periphery of the base.

In some examples a receivable part 230 is provided with radial slicing wings 124 extend outwardly from its base 31. The receivable part slicing wings 124 are provided with the same features and arrangement as receiving part slicing wings 24. The receivable part 230 with slicing wings 124 can be engaged with a decorative or functional panel in the same manner as a receiving part 20 (120). This may be advantageous where a two decorative or functional panel need to be joined together or in full, or partially overlapping.

#### *Panel System and Tool*

In some examples the invention provides a panel system for installation on walls and/or ceilings. The system includes a panel 40 and a panel mount 10 (110) as herein before described. The panel 40 may be any decorative or functional panel. In preferred examples the panel 40 is an acoustic or sound absorbing panel used to mitigate noise and reduce reverberation and echo in a space. The panel 40 has an operative side which includes the required aesthetic or functional properties of the panel, and a mounting side 401 which in situ is arranged to face the wall or ceiling to which the panel 40 is mounted. In preferred examples panels are cut or formed to a

required size and shape. A blind recess 42 for accommodating a receiving part 20 (120) of the mount is cut or formed in the mounting side of the panel 40 as illustrated by figures 4 through 6. In some examples the blind recess 42 can be formed during manufacture of the panel or at a later stage using for example a cutting table with a suitable knife or material removal tool to create or form a suitable blind recess. Steps may include making a cut 41 in the shape of the receiving part 20 (120) and using a tool to remove material from within the cut to form a recess 42. Alternatively a cutting tool can be used to form the cut and remove the material in one step. The blind recess 42 is of a suitable depth to accommodate the receiving part 20 (120) flush or below the face of the mounting side of the panel. Once a receiving part 20 (120) of the mount is located within the blind recess 42 it is twisted to cause the bevelled slicing wings 24 to slice into the area surrounding the wings for locking the receiving part 20 (120) with the panel. The notch 26 in the rear edge 25 of the wings aid in retaining the receiving part 20 (120) in a locked rotation.

In some examples, the panel system is provided with a tool 50 for twisting the receiving part 20 (120) into a locked rotation with the panel 40. The tool includes a grip portion arranged to be securely grasped by the user, and a tool interface at an operative end of the grip. The tool interface is arranged to engage with the tool receptacle for twisting the slicing wings into the panel. The tool interface preferably includes a boss receivable in the receiving passage for centrally locating the tool with the receiving part 20 (120), and one or more complimentary perturbances arranged to rotationally engage with the receiving part perturbances 29 for transferring a twisting force of the tool to the receiving part 20 (120).

The receivable part 20 (120) advantageously secures to a decorative or functional panel without the use of adhesives. The panel mount 10 in turn allows a decorative or functional panel to be mounted without adhesives.

#### *Methods of Prefabricating and Mounting a Panel*

The invention provides an improved method of mounting a panel to a wall or ceiling. The method includes steps of:

- i) cutting or forming a blind recess 42 in a mounting side of the panel 40,

ii) positioning in the recess 42 a receiving part 20 (120) of a panel mount 10 (110),  
iii) twisting the receiving part 20 (120) to cause slicing wings 24 to slice into the panel,  
iv) securing a receivable part 30 (130) of the panel mount 10 (110) to a wall or ceiling, and  
v) positioning the panel 40 in a desired position and engaging the receiving part 20 (120) with the receivable part 30 (130) to secure the panel in the desired position.

One advantage of the improved method over some methods known hitherto is that panels can be prefabricated in the factory with preinstalled receiving parts 20 of the mount and stacked with a plurality of similarly prefabricated panels also having preinstalled receiving parts 20. Because the receiving parts 20 are installed flush or below the mounting face of the panels 40 the plurality of prefabricated panels can be stacked in a so called 'flat-pack' arrangement for conveniently transporting the stacked panels to a location where they are to be mounted to a wall or ceiling.

In some examples the invention provides one or more templates that can be used to position the receiving parts 20 with the panels 40 and to separately position the receivable parts 30 on the supporting substrate (e.g. walls or ceiling), such that not only can panels be prefabricated with preinstalled receiving parts 20 of the mount, the supporting substrate can have receivable parts 30 pre-attached ready to receive and support prefabricated panels.

In some examples the receiving part 20 (120) and receivable part 30 (130) are made from a recycled plastic material. In some examples the material is polyester. In some examples the material is Polyethylene terephthalate. In some examples the decorative or functional panel is made from recycled plastic material such as polyester or Polyethylene terephthalate. Because the receiving part 20 (120) is secured to the panel without the use of adhesive the used panel can be recycled without removal or separation of the receiving part 20 (120). In some examples the panel and receiving part 20 (120) may be recycled together by shredding, blending and thermally bonding for re-use.

One or more aspects and alternatives of the invention have been described by way of example only. Where reference has been made to integers or components having known equivalents, those equivalents are herein incorporated as if individually set forth. It should be noted that

various changes and modifications to the presently preferred aspects and alternatives described herein will be apparent to those skilled in the art and that such changes and modifications may be made without departing from the spirit and scope of the invention and without diminishing its attendant advantages. It is therefore intended that such changes and modifications be included within the scope of the present invention. The invention may also be said broadly to consist in the parts, elements and features referred to or indicated in the drawings and/or specification, individually or collectively, in any or all combinations of two or more of said parts, elements or features.

Reference to any prior art in this specification is not, and should not be taken as, an acknowledgement or any form of suggestion that that prior art forms part of the common general knowledge in any country in the world.

## Claims

1. A panel mount for securing a panel to a support substrate, the mount including:  
a receiving part arranged to secure flush or below a mounting face of a panel, and  
a receivable part arranged to secure to a substrate and to the receiving part, wherein  
the receivable part is arranged to be removably received at least partially within the  
receiving part.
2. The panel mount of claim 1 wherein the receiving part includes a circular body having at  
least two radially extending slicing wings arranged to slice into a panel for securing the receiving  
part with the panel.
3. The panel mount of claim 2 wherein the slicing wings include a bevelled leading edge for  
slicing into a panel
4. The panel mount of claim 2 or claim 3 wherein the slicing wings include a notched trailing  
edge for locking the wings in a panel.
5. The panel mount of any one of claims 2 to 4 wherein the receiving part includes a tool  
receptacle arranged to receive a tool for twisting the slicing wings into a panel.
6. The panel mount of any preceding claim wherein the receivable part includes a base  
having an aperture for receiving a mechanical fastener to secure the receivable part against a  
support substrate, and an insertion portion extending from the base, the insertion portion  
arranged to be removably received with the receiving part.
7. The panel mount of claim 6 wherein the receiving part has a ring-like structure defining a  
central receiving passage arranged to removably receive the insertion portion.
8. The panel mount of claim 7 wherein the receiving passage includes a peripheral  
engagement channel, the insertion portion having at least two attachment clips with each

attachment clip having an engagement flange for matting with the engagement channel when the insertion portion is received with the receiving passage.

9. The panel mount of claim 8 wherein each attachment clip has a radially protruding rib, the engagement flanges arranged to axially secure the receivable part with the receiving part, and

the ribs arranged to laterally (or radially) secure the receivable part with the receiving part.

10. The panel mount of claim 8 or claim 9 wherein the at least two attachment clips are resiliently deformable tabs.

11. The panel mount of any one of claims 8 to 10 wherein the insertion portion includes a plurality of circumferentially spaced attachment clips extending from a periphery of the base.

12. A panel system for securing to a wall or ceiling, the system including a panel and a panel mount of any one of claims 1 to 11, the panel having an operative side and a mounting side, the mounting side provided with a blind recess for accommodating a receiving part of the panel mount flush or below a surface of the mounting side.

13. The panel system of claim 12 further including a tool arranged to engage with the tool receptacle for twisting the slicing wings into the panel.

14. The panel system of claim 12 wherein the panel is an acoustic or sound absorbing panel.

15. A method of mounting a panel to a wall or ceiling, the method including:  
cutting or forming a blind recess in a mounting side of a panel,  
positioning in the recess a receiving part of a panel mount of any one of claims 1 to 11,  
twisting the receiving part to cause slicing wings to slice into the panel,  
securing a receivable part of the panel mount to a wall or ceiling, and  
positioning the panel in a desired position and engaging the receiving part with the receivable part to secure the panel in the desired position.

16. The method of claim 15 including after twisting the receiving part to cause slicing wings to slice into the panel, stacking the panel with a plurality of similar panels having installed receiving parts, and transporting the stacked panels to a location where they are to be mounted to a wall or ceiling.
17. A method of prefabricating an acoustic or sound absorbing panel including installing in a panel a first part of a mounting system, stacking a plurality of the prefabricated panels together and then transporting the stacked panels to a location where the panels are to be mounted.
18. An acoustic or sound absorbing panel, the panel provided with a flush receiving part having a receiving passage arranged to receive an insertion portion of a wall or ceiling mounted receivable part.
19. A receiving part of a panel mount of any one of claims 1 to 11.
20. A receivable part of a panel mount of any one of claims 1 to 11.
21. An acoustic or sound absorbing panel having a blind recess arranged to accommodate a receiving part of a panel mount of any one of claims 1 to 11.
22. A tool having a working end arranged to engage a receiving part of a panel mount of any one of claims 1 to 11 to facilitate twisting of the receiving part in a panel.

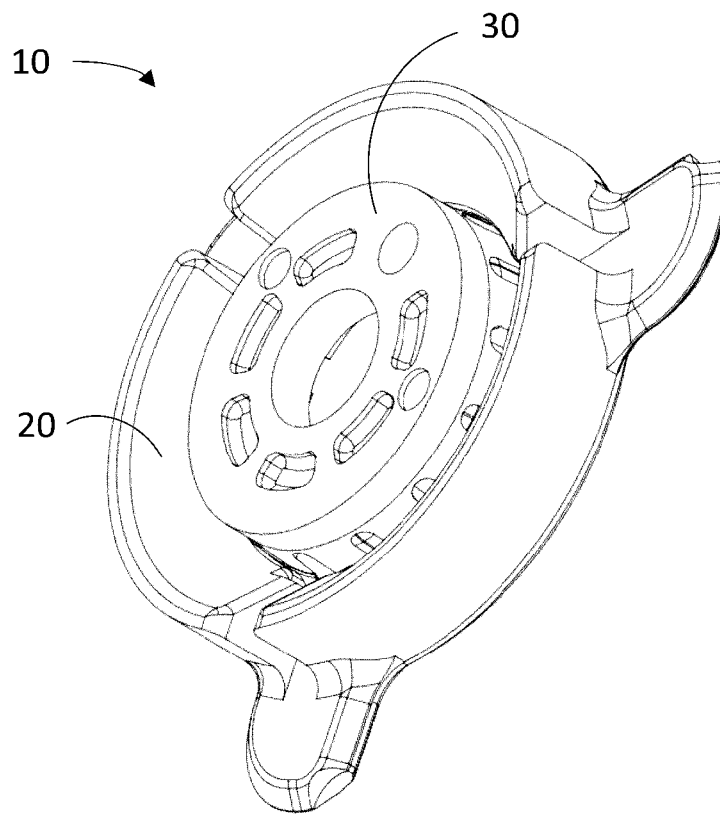
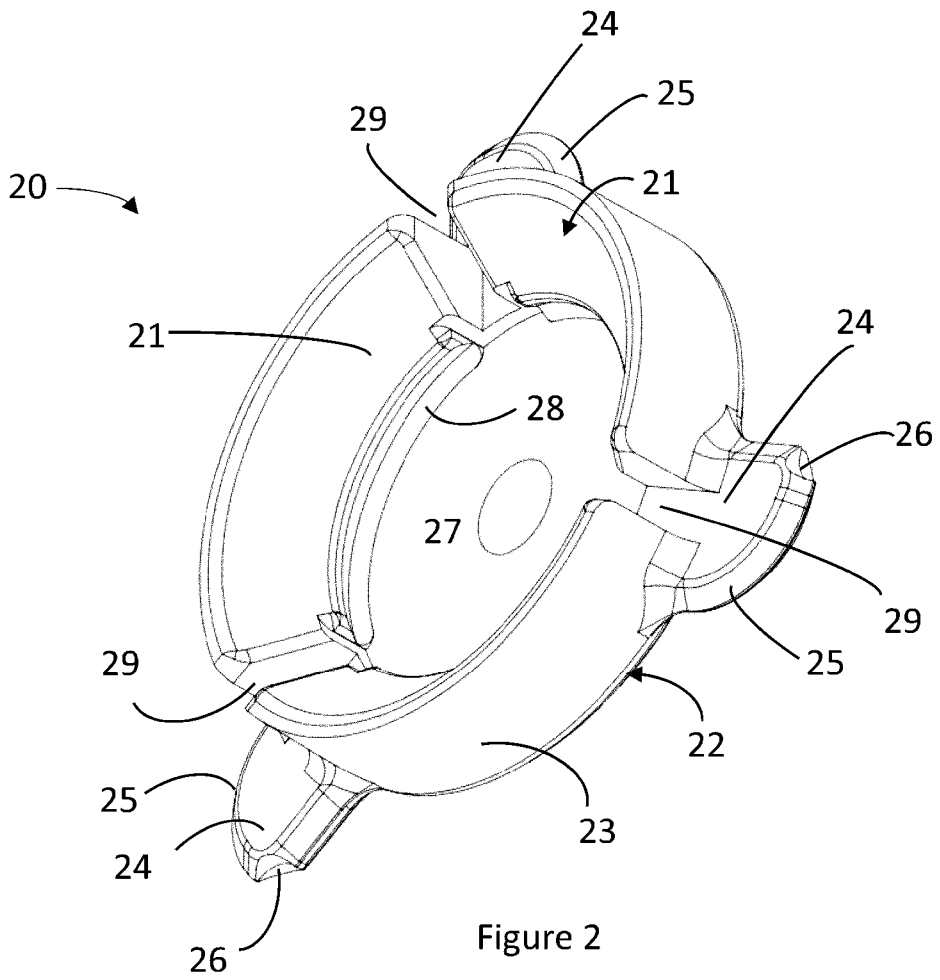
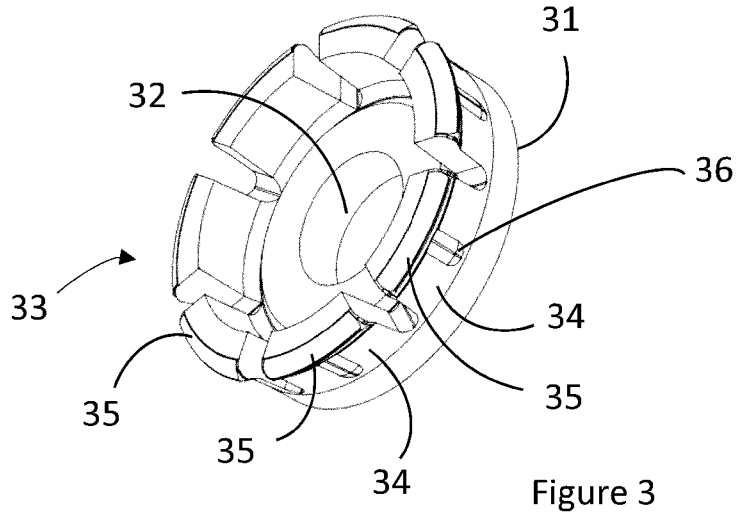


Figure 1

30 →



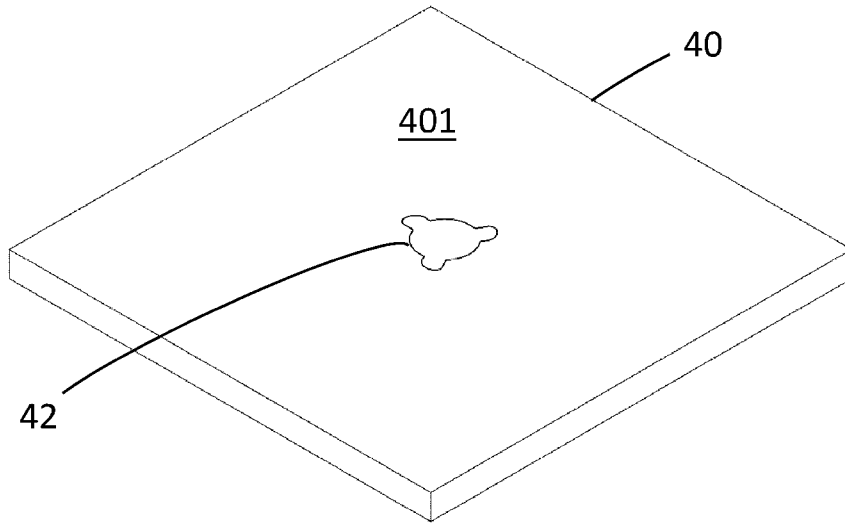


Figure 4

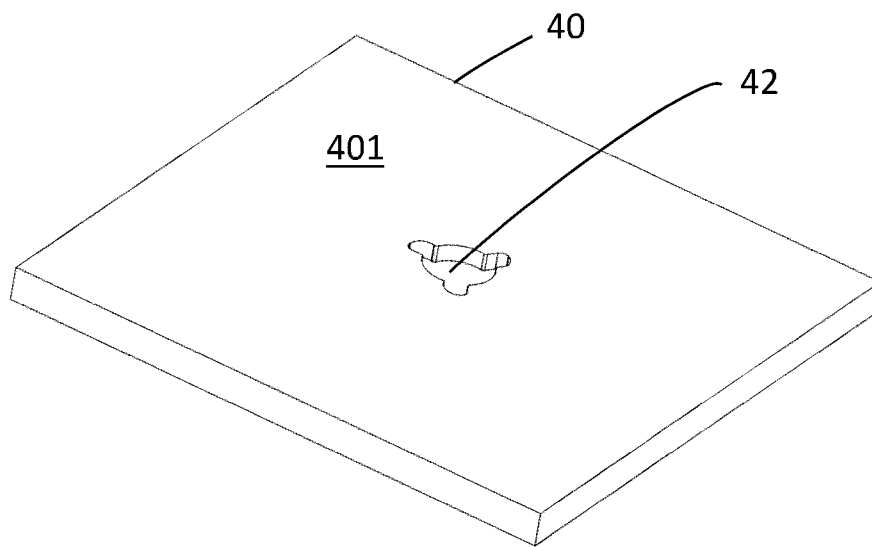


Figure 5

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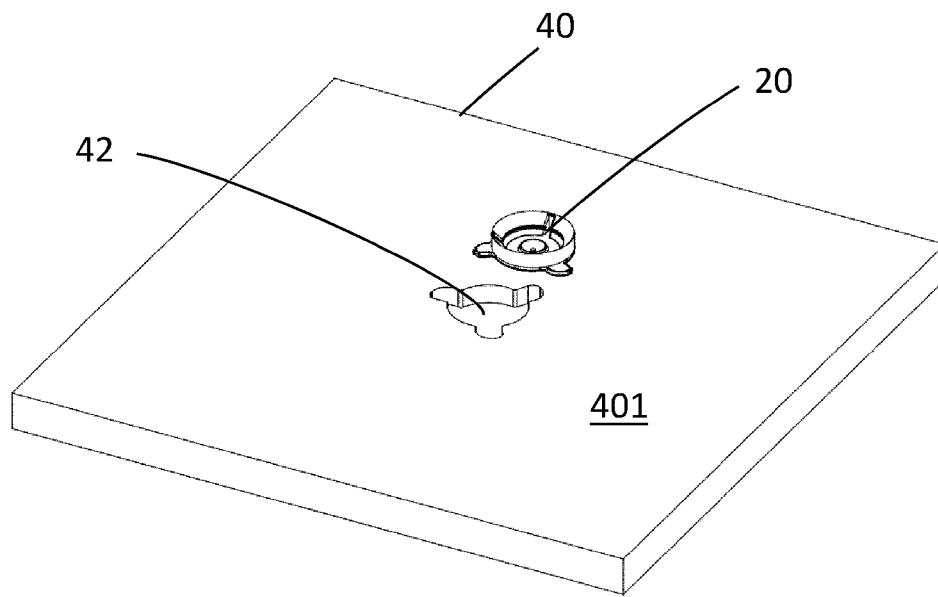


Figure 6

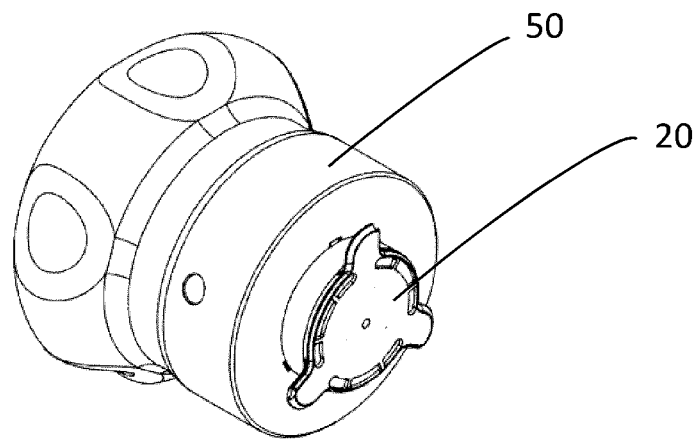


Figure 7

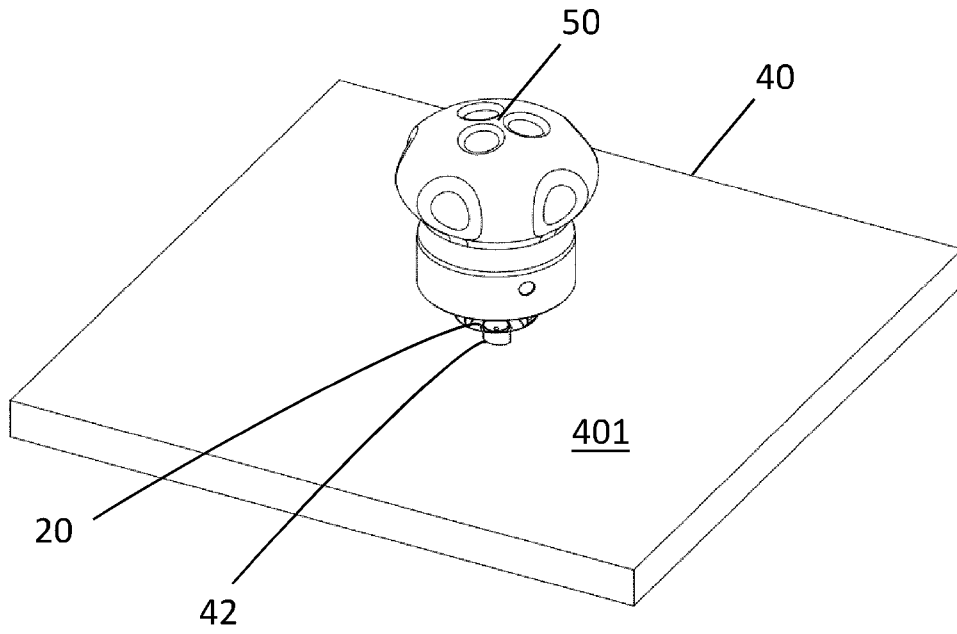


Figure 8

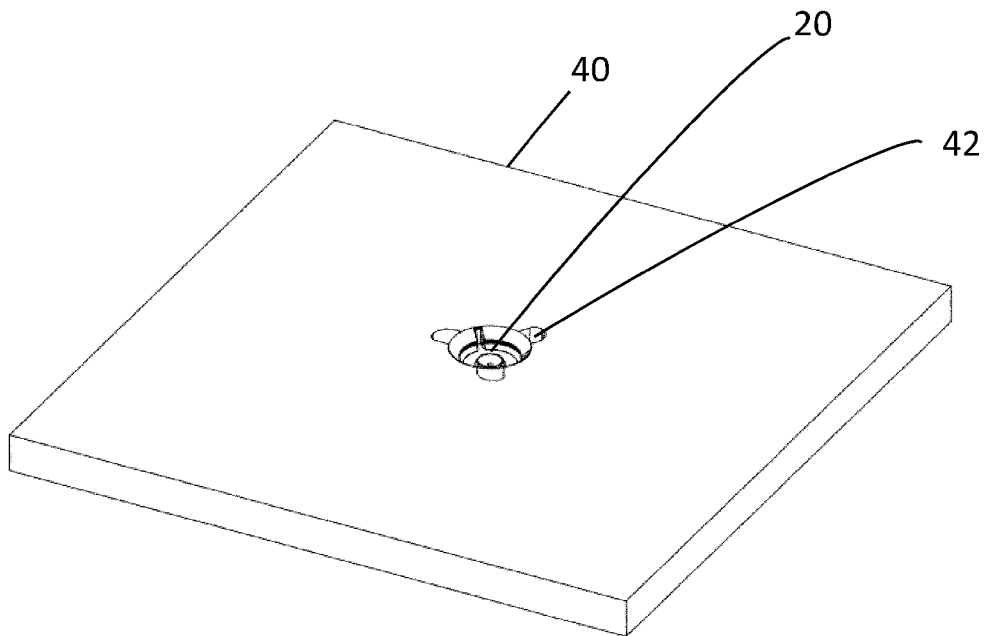


Figure 9

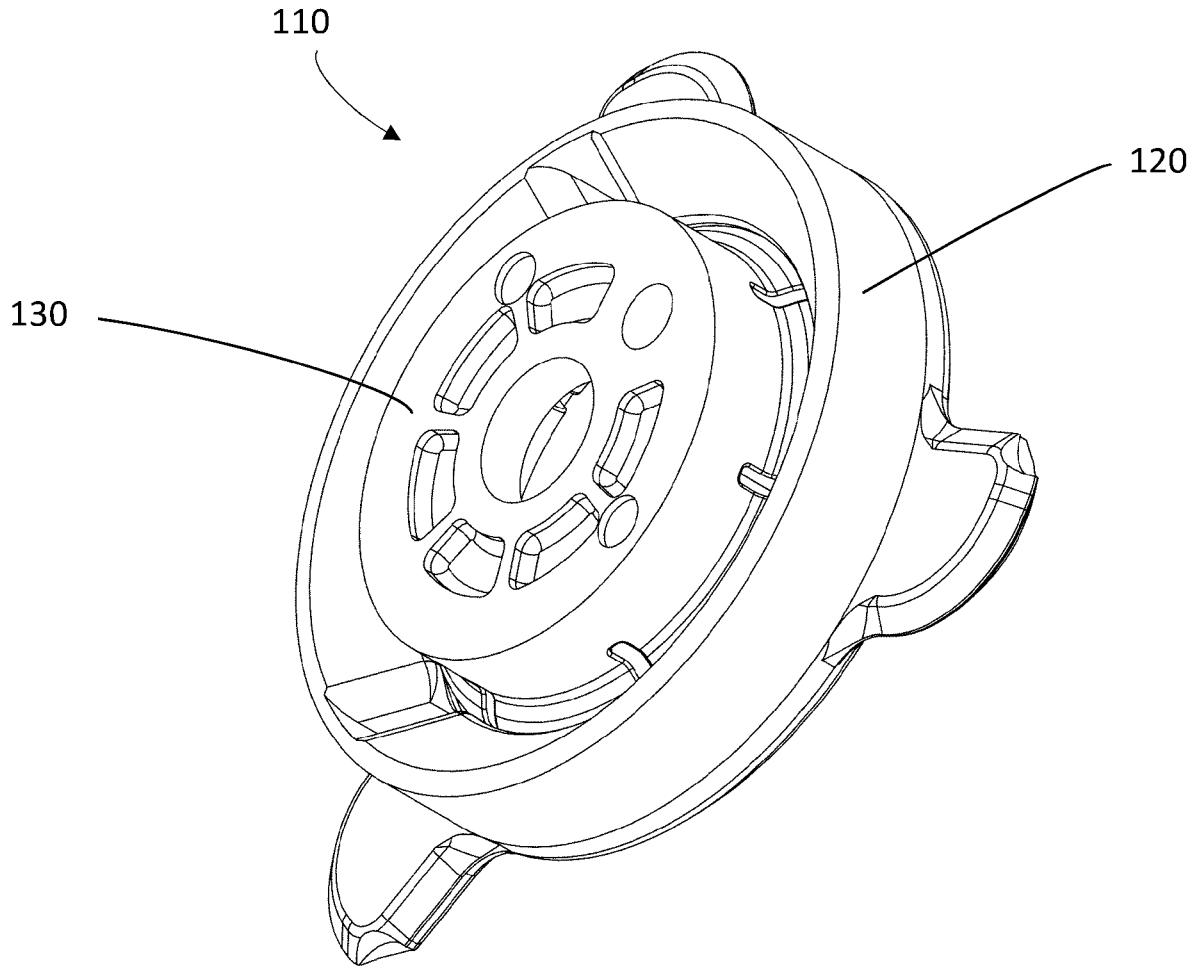
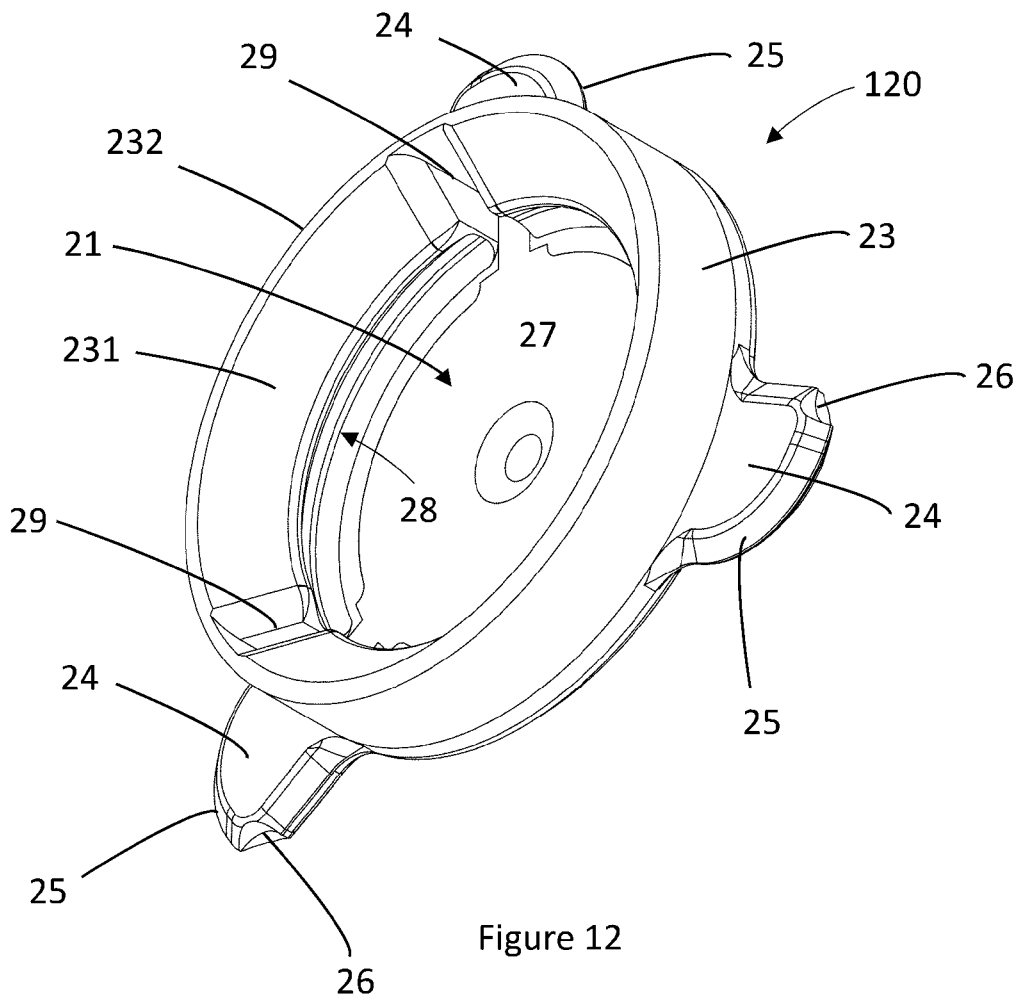
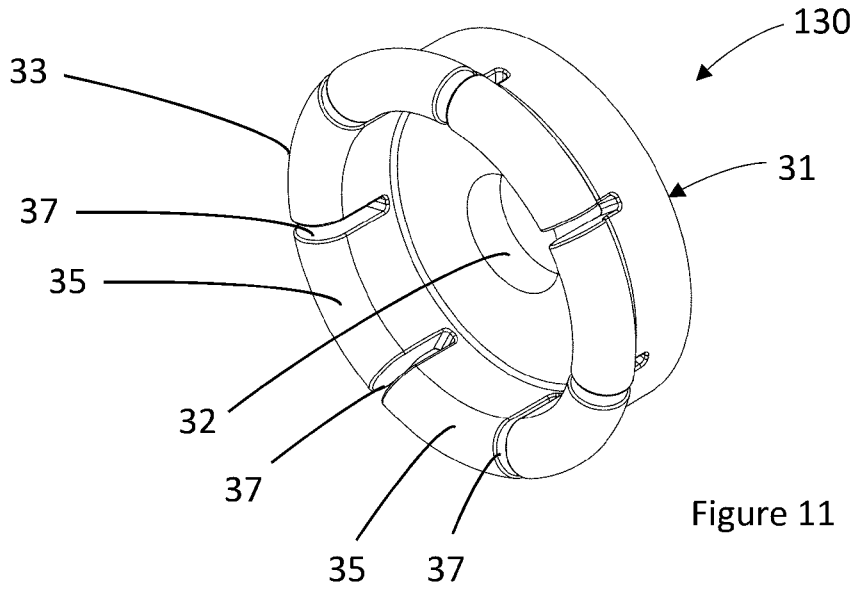


Figure 10



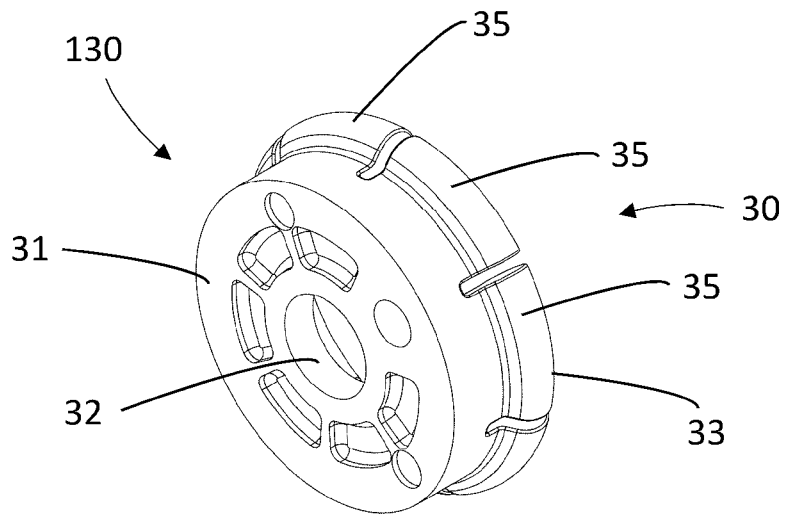


Figure 13

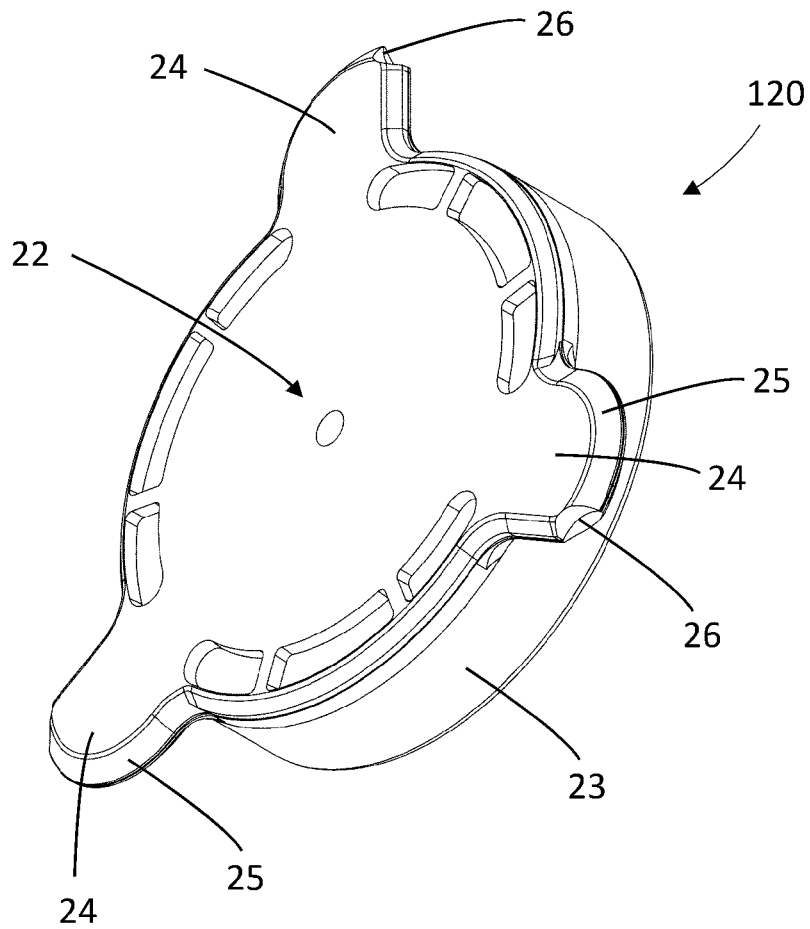


Figure 14

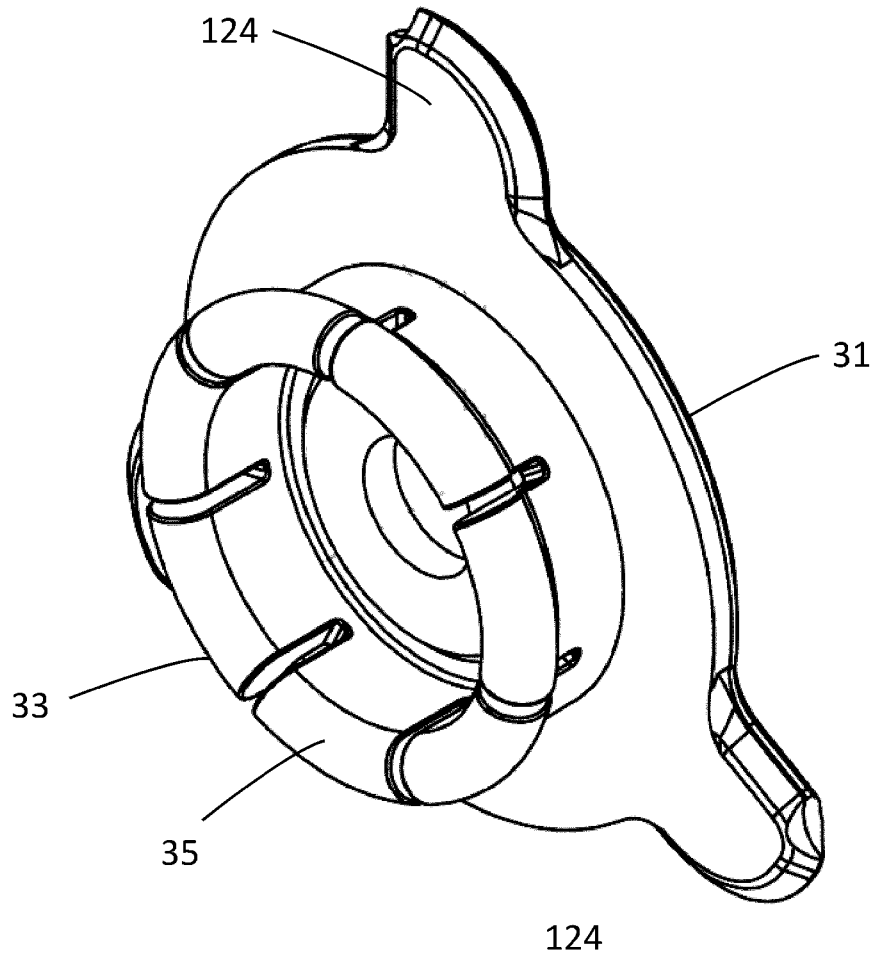


Figure 15