

## **A CLEANING TOOL**

### **FIELD**

[0001] The present invention relates to cleaning tools and more particularly but not exclusively to cleaning tools for food processors.

### **BACKGROUND**

[0002] In the use of a food processor, having a cutting member in the form of a mesh (typically square mesh), food is pushed through the cutting member to cut the food product. Typically food processors will have a feed tube into which the food product is delivered, with the food product then moved into engagement with the cutting member by a “pusher”. The pusher is gripped at one end surface and is moved through the delivery duct to move the food product through the cutting member.

[0003] A disadvantage of the above discussed food processor is that food becomes lodged in the cutting member and is difficult to remove.

### **OBJECT**

[0004] The object of the present invention is to overcome or substantially ameliorate the above disadvantage.

### **SUMMARY**

[0005] There is disclosed herein a tool including:

- a base with a base surface;

- a plurality of projections extending longitudinally from the surface away from the base, the projections being transversely spaced, and each having a longitudinal axis and an end surface extending transverse of the respective axis; and wherein

- the projections are arranged in a first set and a second set, with the projections of the first set having end surfaces that are spaced further from the base surface than the end surfaces of the projections of the second set.

[0006] Preferably, the first set consists of two projections.

[0007] In a further preferred form, the first set consists of three of the projections.

[0008] In an alternative preferred form, the first set consists of four projections.

[0009] Preferably, the axes are generally parallel.

[0035] Preferably, the end surfaces of the second set of projections extend from the base surface by a plurality of distances.

[0011] Preferably, the first set of projections are at least partly formed of steel.

[0012] Preferably, the end surfaces of the first set of projections are domed shaped.

[0013] Preferably, the end surfaces of the first set of projections taper to an apex.

[0014] There is further disclosed herein a cleaning tool including:

a base with a base surface;

a plurality of projections extending longitudinally from the base surface away from the base, each of the projections having a longitudinal axis and an end surface extending generally transverse of the respective axis, with the projections being transversely spaced; and wherein

at least some of the end surfaces does not lie in a flat plane extending perpendicular to the respective longitudinal axis.

[0015] Preferably, at least some of the end surfaces are planar, and are inclined to the respective longitudinal axis by an acute angle.

[0016] Preferably, at least some of the projections are square in transverse cross-section.

[0017] In a further preferred form the majority of the projections are square in transverse cross-section.

[0018] Preferably, the axes are generally parallel.

[0019] Preferably, the base provides for the coupling of the cleaning tool to a handle.

[0020] Preferably, the base provides a socket to engage the handle to which the tool is to be attached.

[0021] Preferably, the base provides a resilient clip to engage the handle to fix the cleaning tool to the handle.

[0022] There is further disclosed herein, in combination, the above cleaning tool and a food processor, the food processor having a cutting member that provides a plurality of first cutting blades and a plurality of second cutting blades, the first cutting blades being transverse the second cutting blades, so that the cutting blades provide a plurality of apertures, with the projections configured to be received within the apertures.

[0023] Preferably, each of the apertures is a complimentary shape to a respective one of the projections.

[0024] Preferably, the apertures are of a square configuration.

[0025] Preferably, the cutting member has a cutting surface through which the projections extend, with said base surface having an area less than the area of said cutting surface.

[0026] Preferably, said base surface is approximately a quarter of said cutting surface.

[0027] Preferably, the above combination includes a pusher fixed to the cleaning tool.

[0028] There is still further disclosed herein a pusher assembly for a food processor having a feed tube that is to receive a food product, with the pusher assembly configured to engage within the feed tube so that upon movement of the pusher assembly along the feed tube, the food product is moved into engagement with the food processor, the assembly including:

a pusher configured to be received within the feed tube, the pusher providing an end surface to which a user can apply pressure to to move the pusher assembly into the feed tube;

a cleaning tool fixed to the pusher, the cleaning tool including:

a plurality of projections that extend longitudinally from the pusher, away from the pusher, the projections being transversely spaced, and each having a longitudinal axis and an end face extending transverse of the respective axis.

[0029] Preferably, the projections are arranged in a first set and a second set, with the projections of the first set having end surfaces that are spaced further from the pusher than the end surfaces of the projections of the second set.

[0030] Preferably, at least some of the end surfaces do not lie in a flat plane extending generally perpendicular to the longitudinal axes of the projections.

[0031] Preferably, the pusher and cleaning tool are integrally formed.

[0032] There is still further disclosed herein a food processor including:

- a bowl providing an upper rim surrounding a top opening;
- a blade drive assembly located in the bowl;
- a cutting blade mounted on the drive so as to be driven thereby about a generally upright rotational axis;
- a lid removably coupled to the bowl and at least partly closing said opening; and
- a bearing ring facing the blade and fixed to the lid and providing a bearing surface to be engaged by the blade.

[0033] Preferably, the bearing ring is formed of hardener material than the lid.

[0034] Preferably, the lid has a downwardly facing surface with an annular recess within which the ring is fixed.

[0035] Preferably, the bearing member is a ring surrounding said axis.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

[0036] Preferred forms of the present invention will now be described by way of example with reference to accompanying drawings wherein:

[0037] Figure 1 is a schematic isometric view of a food processor and cleaning tool;

[0038] Figure 2 is a schematic section side elevation of the food processor and cleaning tool of Figure 1;

[0039] Figure 3 is a schematic parts exploded isometric view of the cleaning tool of Figures. 1 and 2;

[0040] Figure 4 is a schematic part sectioned side elevation of the cleaning tool of Figure 3;

[0041] Figure 5 is a schematic parts exploded isometric view of a modification of the cleaning tool of Figure 3;

[0042] Figure 6 is a schematic part sectioned side elevation of the cleaning tool of Figure 5;

[0043] Figure 7 is a schematic isometric view of a modification of the cleaning tool of Figure 3;

[0044] Figure 8 is a schematic bottom isometric view of the cleaning tool of Figure 7;

[0045] Figure 9 is a schematic plan view of the cleaning tool of Figure 7;

[0046] Figure 10 is a schematic isometric view of a modification of the cleaning tool of Figure 3;

[0047] Figure 11 is a schematic bottom isometric view of the cleaning tool of the Figure 10;

[0048] Figure 12 is a schematic plan view of the cleaning tool of Figure 10;

[0049] Figure 13 is a schematic isometric view of a modification of the cleaning tool of Figure 3;

[0050] Figure 14 is a schematic bottom isometric view of the cleaning tool of Figure 13;

[0051] Figure 15 is a schematic top plan view of the food processor of Figure 1;

[0052] Figure 16 is a schematic sectioned side elevation of the food processor as shown in Figure 15, sectioned along the line 16-16;

[0053] Figure 17 is a schematic sectioned side elevation of portion of the food processor as shown in Figure 16, with a food product being processed; and

[0054] Figure 18 is a further schematic sectioned side elevation of the processor portion as shown in Figure 17.

## **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

[0055] In the accompanying drawings there is schematically illustrated a food processor 10. The food processor 10 includes a container 44. The container 44 includes a bowl 11 having a generally cylindrical side wall 12 and a floor 13. The side wall 12 and floor 13 substantially surround an interior 14 that receives a processed food product.

[0056] As best seen in Figure 2, the upper rim 15 is stepped so as to provide an angular surface 16 that is circular in configuration and surrounds the central longitudinal axis 17 of the food processor 10.

[0057] Supported by the rim 15 is a cutting member 18, that in this embodiment is generally circular in configuration. The cutting member 18 includes a peripheral (circular) part 19 that engages and supports a blade assembly 20.

[0058] The blade assembly 20 is of a mesh construction in that it includes a first set of blades 21 that are generally parallel and are transversely spaced, and a second set of blades 22 that are generally parallel and are transversely spaced, with the blades 21 being generally perpendicular to the blades 22 so that there is provided a plurality of apertures 23. In this embodiment the blades 21 are equally spaced, and the blades 22 equally spaced so that the apertures 23 are generally square in configuration.

[0059] Preferably, the part 19 is formed of plastics material, and the blades 21 and 22 formed of steel, with upwardly projecting sharp edges.

[0060] Typically, the food processor 10 would include a lid 46 mounted on the rim 15 that has a feed tube into which food product is delivered. A pusher 24 has a cross-sectional configuration that would match the feed tube 47 so that when the pusher 24 was moved down the feed tube 47,

by a user applying force to the end surface 46, the food product is forced passed the blades 21 and 22 so as to be delivered through the apertures 23 to the interior 14.

[0061] As best seen in Figure 16, the lid 44 on its undersurface has a circular bearing member 48 that faces downwardly. The member 48 is of harder material than the lid 44, and is received in an annular slot 49 in the lid 44. The member 48 extends about the axis 17.

[0062] Mounted centrally of the food processor 10 is the drive transmission 49 that is driven by a motor located in the base upon which the food processor 10 is located. This is best seen in Figure 16. The drive transmission 49 rotatably drives a cutting disc 50 about the axis 17. The cutting disc 50 has a cutting blade 51, with an aperture 52, in the disc 50, being located below the cutting blade 51. The cutting blade 51 has a ramp portion 56.

[0063] As is best seen in Figures 17 and 18, as the cutting blade 51 engages and moves through the food product 53 a slice is taken from the food product 53 and forced through the aperture 52 and through the apertures 23 by the ramp portion 56.

[0064] The disc 50 is also provided with an annular flange 54 that projects upwardly, and is provided with a rim portion 55.

[0065] In operation of the above described blade 51, as the blade 51 passes through the food product 53, and forces the food product 53 downward through the aperture 23, an upward force is applied to the blade 51 and therefore the disc 50. This upward force moves the disc 50 upwardly so that the rim 55 slidably engages the bearing member 48.

[0066] As best seen in Figures 3 and 4, the pusher 24 has a longitudinal axis 45 that would also be the axis of the delivery tubes.

[0067] To clean the blade member 19, and in particular to remove food that remains in the apertures 23, there is provided a cleaning tool 25. The cleaning tool 25 includes a base 26. The base 26 includes a generally planar portion 27 from which there extends a flange 28 so as to provide a socket 29 into which the end extremity 30 of the pusher 24 is received, so that the cleaning tool 25 is secured to the pusher 24. Accordingly, the flange 28 is a configuration that matches the configuration of the end extremity 30 of the pusher 24.

[0068] The flange 28 includes at least one resilient pawl (preferably two resilient pawls) 31, each with a lip 32 that is received within a correspondingly shaped aperture 33 in the lower portion 30 of the pusher 24. The pawls 31 are resiliently formed when the tool 25 being applied to the pusher 24, so that when in a correct position mounted on the lower portion 30, each lip 32 is received within a respective one of the apertures 33 so as to be retained therein, and therefore fixing the cleaning tool 25 to the pusher 24.

[0069] The tool 25 may be removed from the pusher 30 by engaging one or both of the pawls 31 to deflect them transversely outwardly and remove the lip or lips 32 from the recesses 33.

[0070] The flange 28 would also have a slot 34 that receives the lower end extremity of a longitudinal guide rib 35 of the pusher 24.

[0071] The portion 27 has a major surface 36 from which there projects a plurality of projections 37, with each of the projections 37 projecting from the surface 36 in a direction away from the base 26.

[0072] Each of the projections 37 has a longitudinal axis 38 so that each projection 37 projects longitudinally from the base 26. Preferably, each of the axis 38 is generally perpendicular to the portion 27, and therefore generally perpendicular to the surface 36. Accordingly the axes are generally parallel.

[0073] Each of the projections 37 has an end surface 39 that is at least not entirely, located within a flat plane generally perpendicular to the respective axis 38.

[0074] In the embodiment of Figures 7 to 9 the end surfaces 39 are generally planar, with at least the surfaces 39 inclined by an acute angle to their respective axis 38. It is also preferable for each of the end surfaces 39 to be inclined at a different orientation to other end surfaces 39.

[0075] The projections 37 are transversely spaced so as to be separated by slots 40.

[0076] The projections 37 are a set of projections 37, with the cleaning tool 25 having a further set of projections 41. The projections 41 are a first set of projections 41, while the projections 39 are a second set of projections 37. Preferably, the projections 37 and 41 are rigid.



[0077] Preferably, the projections 41 have end surfaces that are spaced further from the surface 36 by a greater distance than the end surfaces 39. The projections 41 aid in correctly aligning the cleaning tool 25 when it is being moved into engagement with the cutting member 18.

[0078] Preferably, the cutting edges of the blades 21 and 22 are located in a plane 43, with the blade assembly 20 having an area, in the plane 43, that is greater than the area of the surface 36. Preferably, the surface 36 is approximately 25% of the area of the blade assembly 20 in the plane 43.

[0079] In the embodiment of Figures 2 to 9, there are two projections (guide pins) 41. In the embodiment of Figures 10 to 12, the projections 41 have end surfaces 42 that are differently shaped, and are differently located. The end surfaces 42 are also differently configured relative to the end surfaces 42 of the embodiment of Figure 7, in the embodiment of Figures 10 to 12, the surfaces 42 are generally planar, while the surfaces 42 of the embodiment of Figures 7 and 9, are dome shaped. The projection may be of plastics material, but more preferably are formed of steel, and may include a plastic base with a steel cap. Preferably the end surfaces 42 taper to an apex.

[0080] In the embodiment of Figures 13 and 14, the projections 41 are similarly located as the projections 41 of the embodiment of the Figures 7 and 9, however the end surfaces 42 are like the end surfaces 39.

[0081] Preferably, the projections 41 have less clearance when entering the apertures 23 relative to the projections 37, to better align the projections 37 with the apertures 23 and avoid damage to the projections 37.

[0082] Each of the projections 37 has a cross-sectional shape, transverse of the respective axis 38, that is approximate the cross-sectional configuration of each of the apertures 23, with each projection 39 and 41 having a longitudinal length that ensures each of the projections 39 and 41 passes longitudinally through a respective one of the apertures 23. However it should be noted the projections 41 are longer than the projections 39. Accordingly the end surfaces of the projections 41 engage the food first and remove the food before the projections 39 engage the food. This reduces the effort required.

[0083] The axes 17, 38 and 45 are generally parallel, with the pusher 24 moved in a direction parallel to the axis 17 when applied to the cutting member 18.

[0084] In the above described preferred embodiments, the cleaning tool 25 is releasably coupled to the pusher 24. In an alternative embodiment, the cleaning tool 25 is integrally formed with the pusher 24. As an example, the cleaning tool 25 and pusher 24 may be integrally moulded from plastics material. In such an embodiment the skirt 28 would not be required, and the projections 37 and 41 would merely project from the end surface 47 of the pusher 24.

**CLAIMS:**

1. A tool including:  
a base with a base surface;  
a plurality of projections extending longitudinally from the surface away from the base, the projections being transversely spaced, and each having a longitudinal axis and an end surface extending transverse of the respective axis; and wherein  
the projections are arranged in a first set and a second set, with the projections of the first set having end surfaces that are spaced further from the base surface than the end surfaces of the projections of the second set.
2. The tool of claim 1, wherein the first set consists of two projections.
3. The tool of claim 1, wherein the first set consists of three of the projections.
4. The tool of claim 1, wherein the first set consists of four projections.
5. The tool of any one of claims 1 to 4, wherein the axes are generally parallel.
6. The tool of any one of claims 1 to 5, wherein the end surfaces of the second set of projections extend from the base surface by a plurality of distances.
7. The tool of any one of claims 1 to 6, wherein the first set of projections are at least partly formed of steel.
8. The tool of any one of claims 1 to 7, wherein the end surfaces of the first set of projections are domed shaped.
9. The tool of any one of claims 1 to 7, wherein the end surfaces of the first set of projections taper to an apex.
10. A cleaning tool including:  
a base with a base surface;

a plurality of projections extending longitudinally from the base surface away from the base, each of the projections having a longitudinal axis and an end surface extending generally transverse of the respective axis, with the projections being transversely spaced; and wherein at least some of the end surfaces does not lie in a flat plane extending perpendicular to the respective longitudinal axis.

11. The tool of claim 10, wherein at least some of the end surfaces are planar, and are inclined to the respective longitudinal axis by an acute angle.

12. The tool of claim 10 or 11, wherein at least some of the projections are square in transverse cross-section.

13. The tool of claim 10, 11 or 12, wherein the projections are square in transverse cross-section.

14. The tool of any one of claims 10 to 13, wherein the axes are generally parallel.

15. The tool of any one of claims 10 to 14, wherein the base provides for the coupling of the cleaning tool to a handle.

16. The tool of any one of claims 10 to 15, wherein the base provides a socket to engage the handle to which the tool is to be attached.

17. The tool of any one of claims 10 to 16, wherein the base provides a resilient clip to engage the handle to fix the cleaning tool to the handle.

18. In combination, the cleaning tool of any one of claims 1 to 17 and a food processor, the food processor having a cutting member that provides a plurality of first cutting blades and a plurality of second cutting blades, the first cutting blades being transverse the second cutting blades, so that the cutting blades provide a plurality of apertures, with the projections configured to be received within the apertures.

19. The combination of claim 18, wherein the apertures is a complimentary shape to a respective one of the projections.

20. The combination of claim 18 or 19, wherein the apertures are of a square configuration.
21. The combination of claim 18, 19 or 20, wherein the cutting member has a cutting surface through which the projections extend, with said base surface having an area less than the area of said cutting surface.
22. The combination of claim 18, wherein, said base surface is approximately a quarter of said cutting surface.
23. The combination of any one of claims 18 to 22, further including a pusher fixed to the cleaning tool.
24. A pusher assembly for a food processor having a feed tube that is to receive a food product, with the pusher assembly configured to engage within the feed tube so that upon movement of the pusher assembly along the feed tube, the food product is moved into engagement with the food processor, the assembly including:  
a pusher configured to be received within the feed tube, the pusher providing an end surface to which a user can apply pressure to to move the pusher assembly into the feed tube;  
a cleaning tool fixed to the pusher, the cleaning tool including:  
a plurality of projections that extend longitudinally from the pusher, away from the pusher, the projections being transversely spaced, and each having a longitudinal axis and an end face extending transverse of the respective axis.
25. The pusher assembly of claim 24, wherein the projections are arranged in a first set and a second set, with the projections of the first set having end surfaces that are spaced further from the pusher than the end surfaces of the projections of the second set.
26. The pusher assembly of claim 25, wherein at least some of the end surfaces do not lie in a flat plane extending generally perpendicular to the longitudinal axes of the projections.
27. The pusher assembly of claim 25 or 26, wherein the pusher and cleaning tool are integrally formed.

28. A food processor including:  
a bowl providing an upper rim surrounding a top opening;  
a blade drive assembly located in the bowl;  
a cutting blade mounted on the drive so as to be driven thereby about a generally upright rotational axis;  
a lid removably coupled to the bowl and at least partly closing said opening; and  
a bearing member facing the blade and fixed to the lid and providing a bearing surface to be engaged by the blade.
29. The food processor of claim 28, wherein the bearing member is formed of hardener material than the lid.
30. The food processor of claim 28 or 29, wherein the lid has a downwardly facing surface with an annular recess within which the bearing member is fixed.
31. The food processor of claim 30, 31 or 32, wherein the bearing member is a ring surrounding said axis.

**ABSTRACT**

A cleaning tool (25) for a food processor (10), having a blade assembly (20) providing a plurality of apertures (23) that are to be cleaned by the tool (25). The tool (25) has a plurality of projections (37) that pass through the aperture (23) to clean the apertures, and a further set of projections (41) that act as guides when engaging the apertures (23).

Fig 1

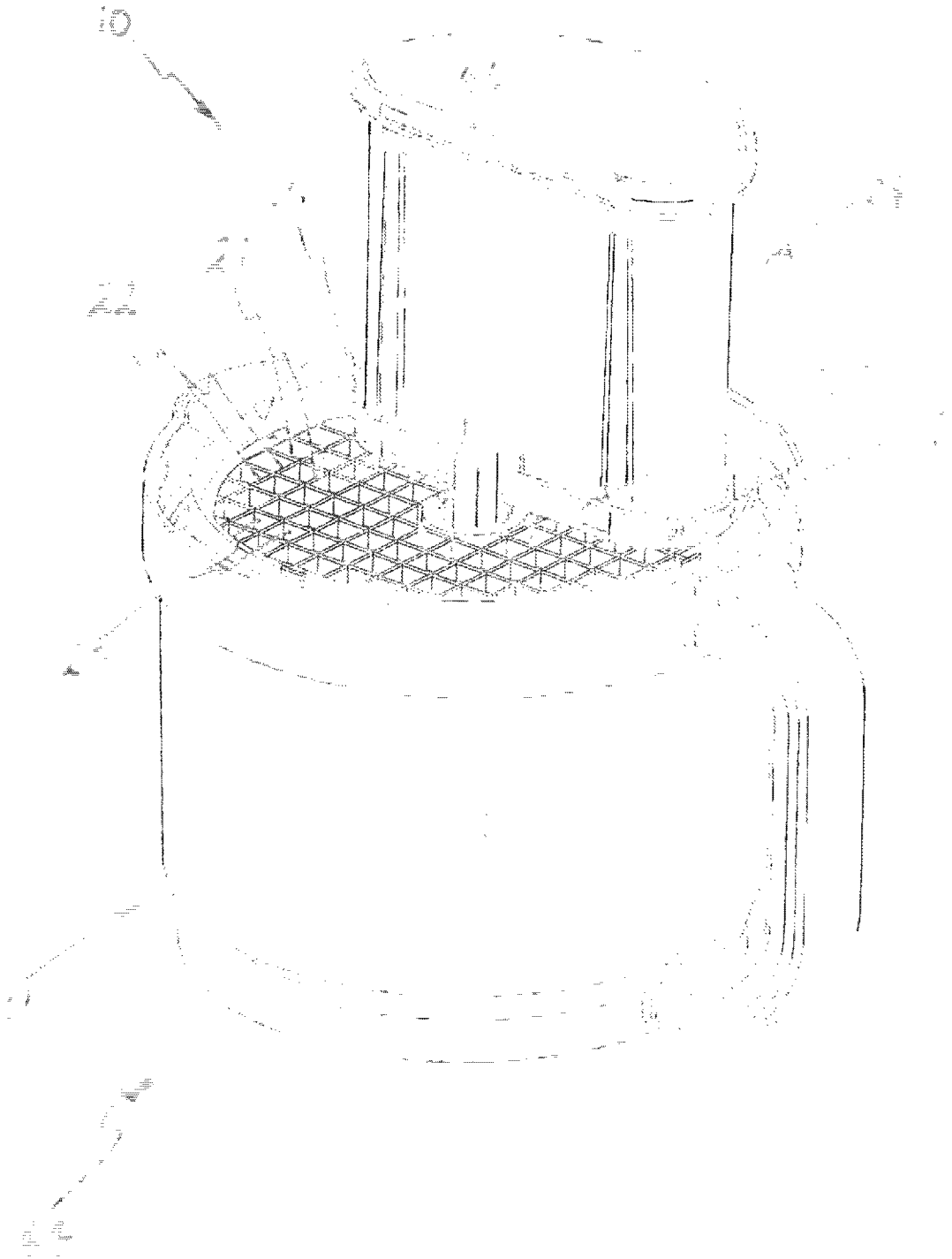
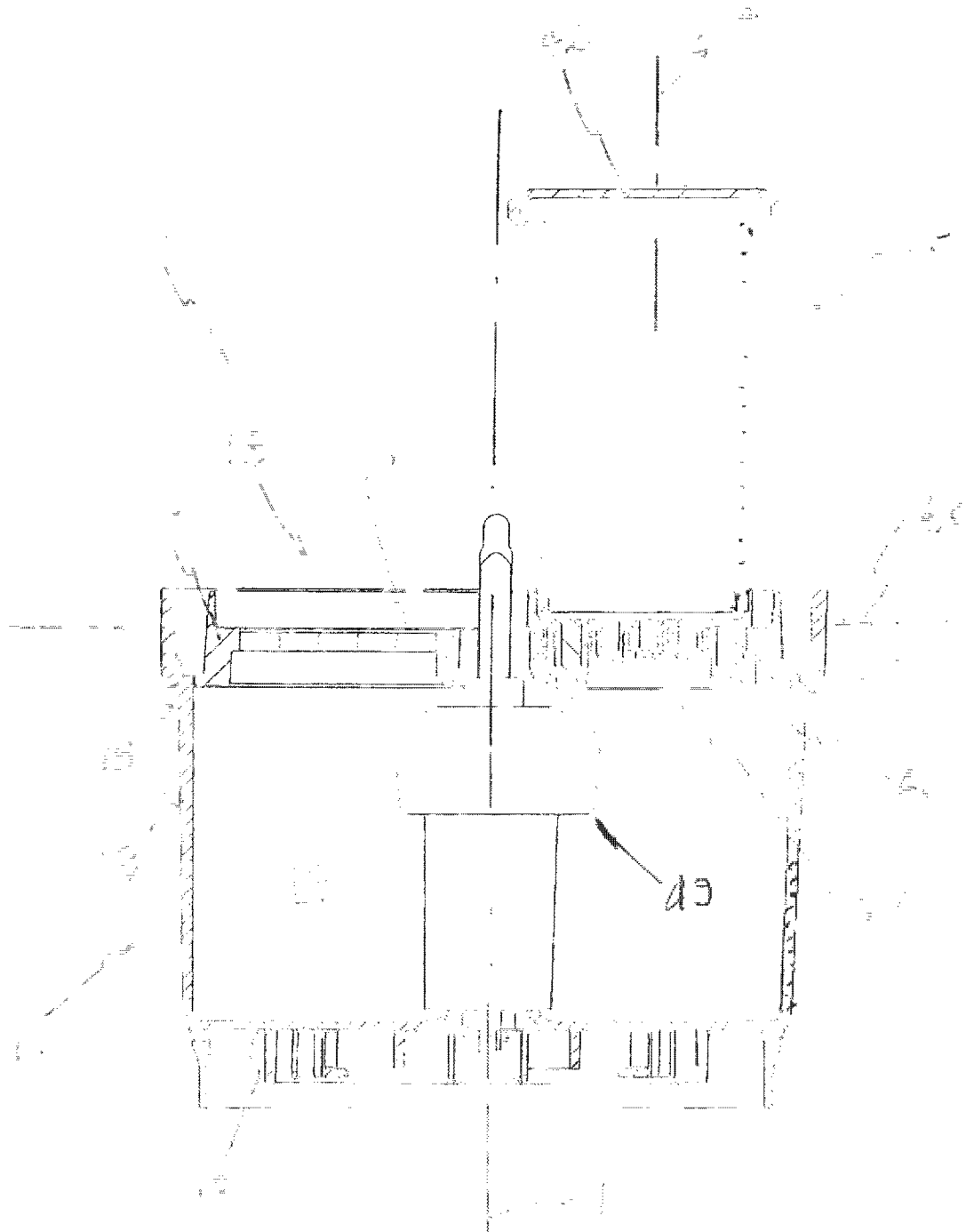
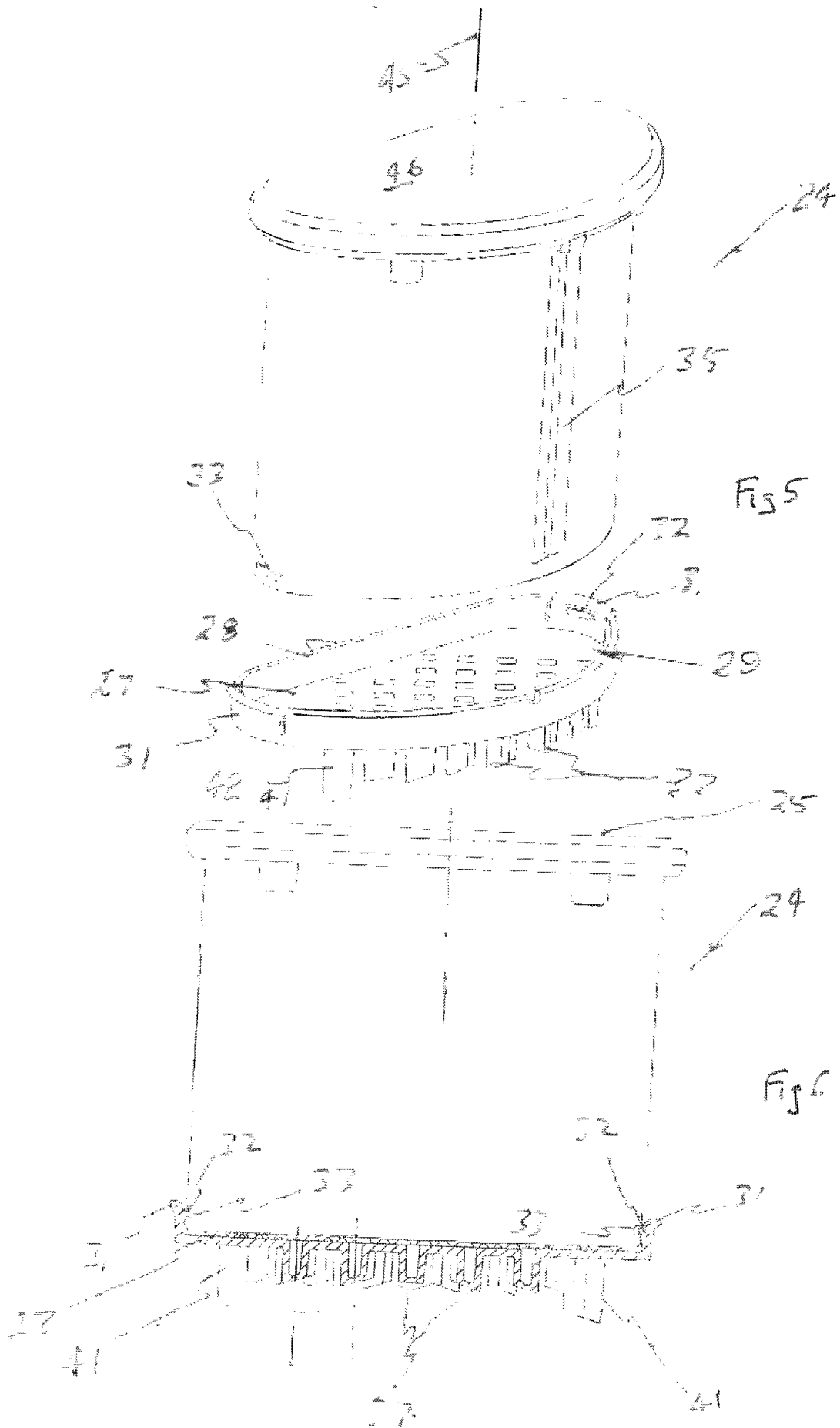


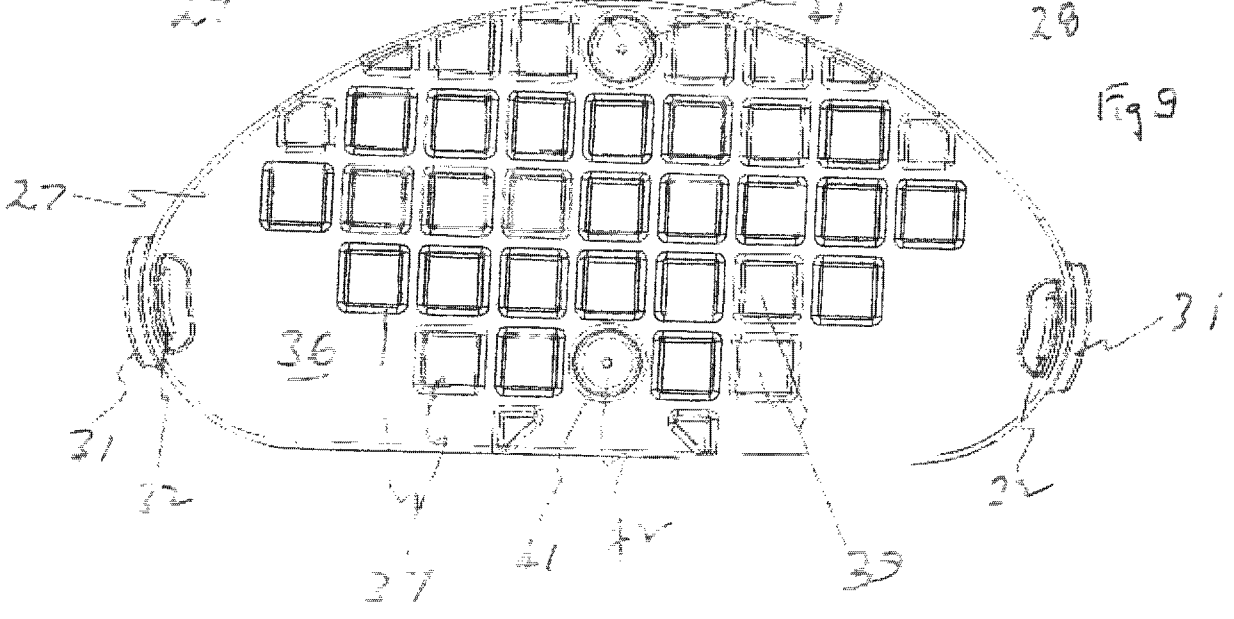
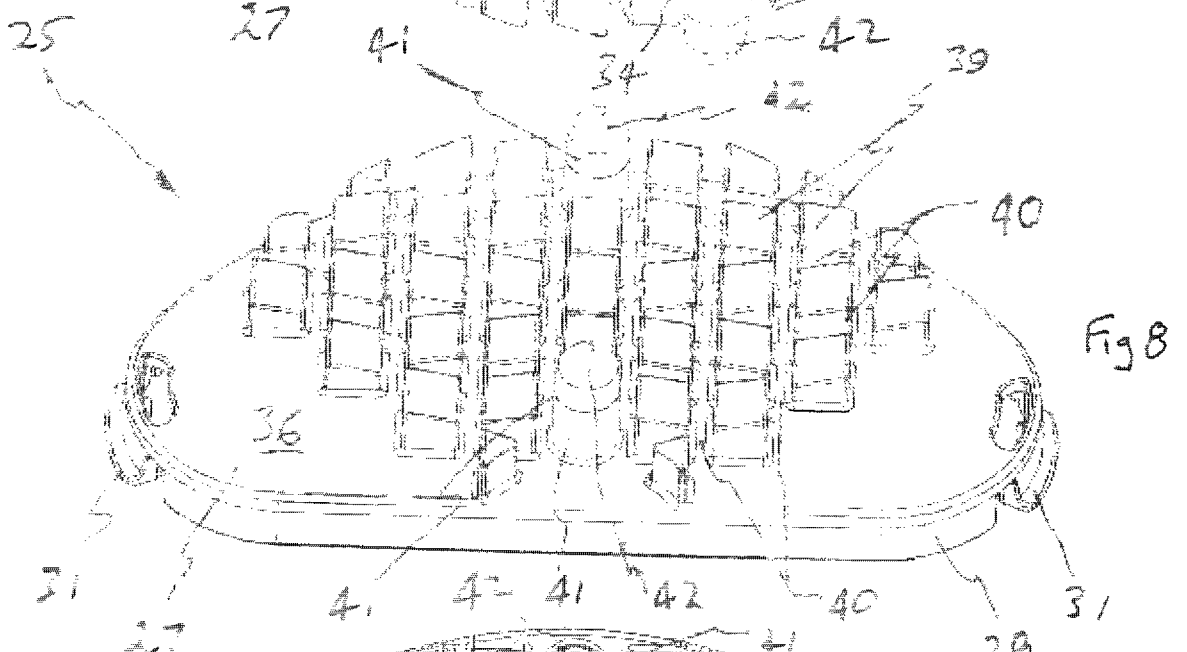
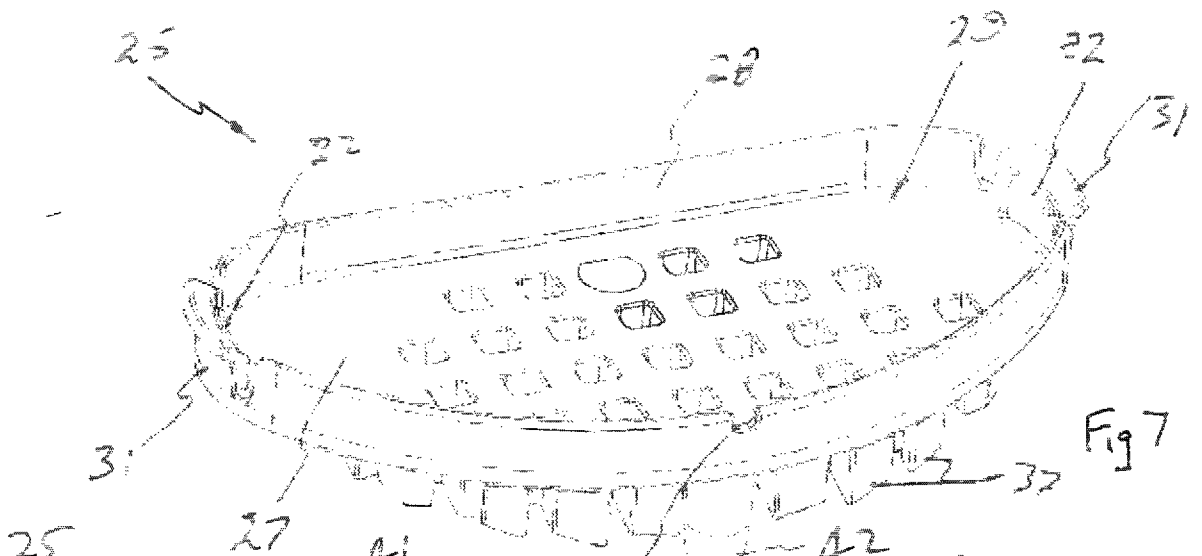


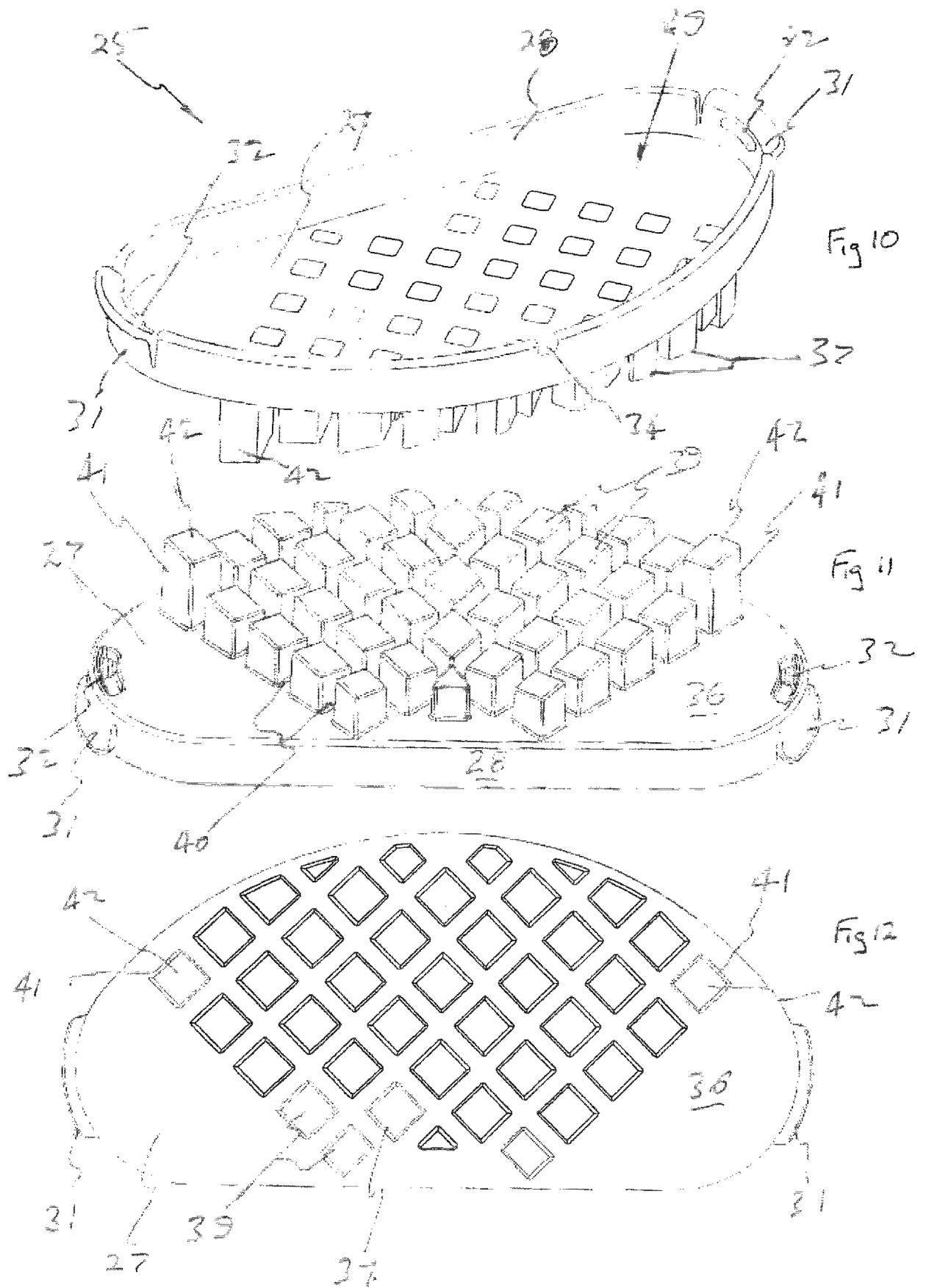
Fig 2











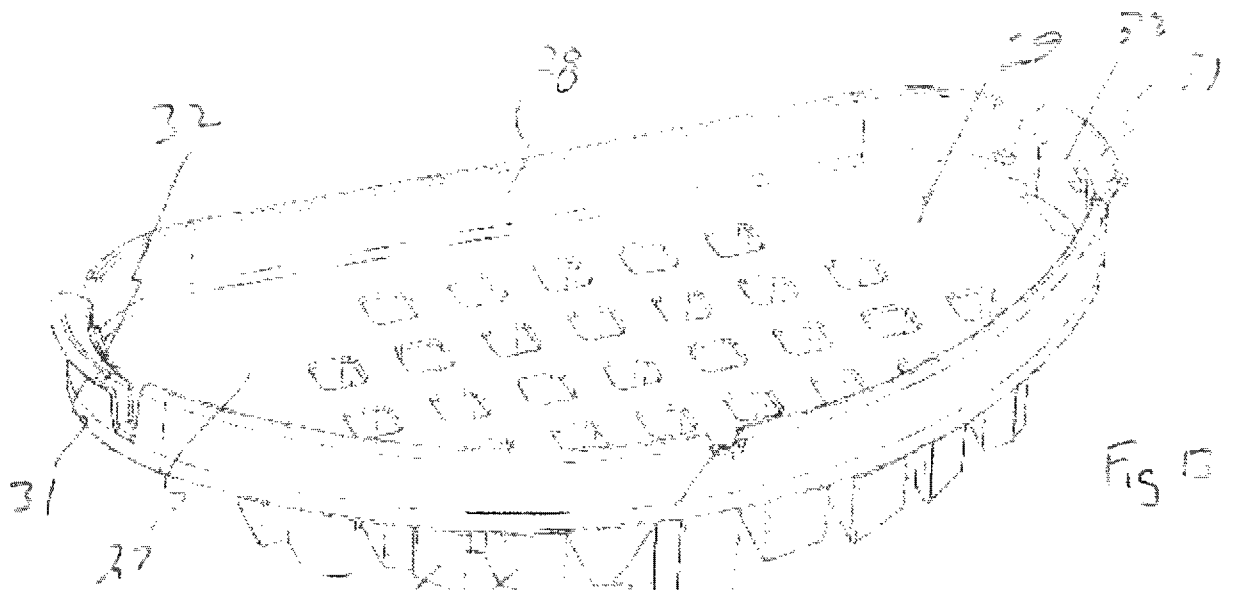


FIG 13

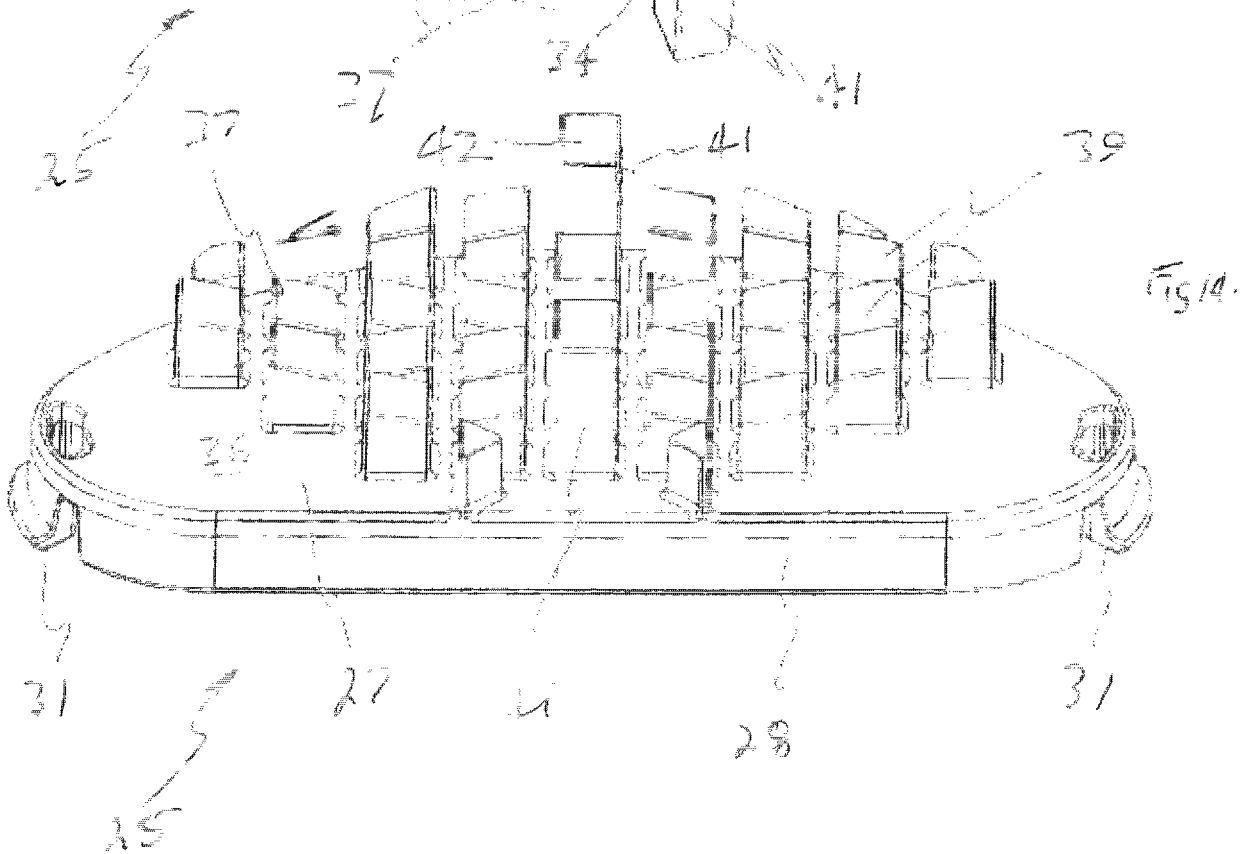


FIG 14

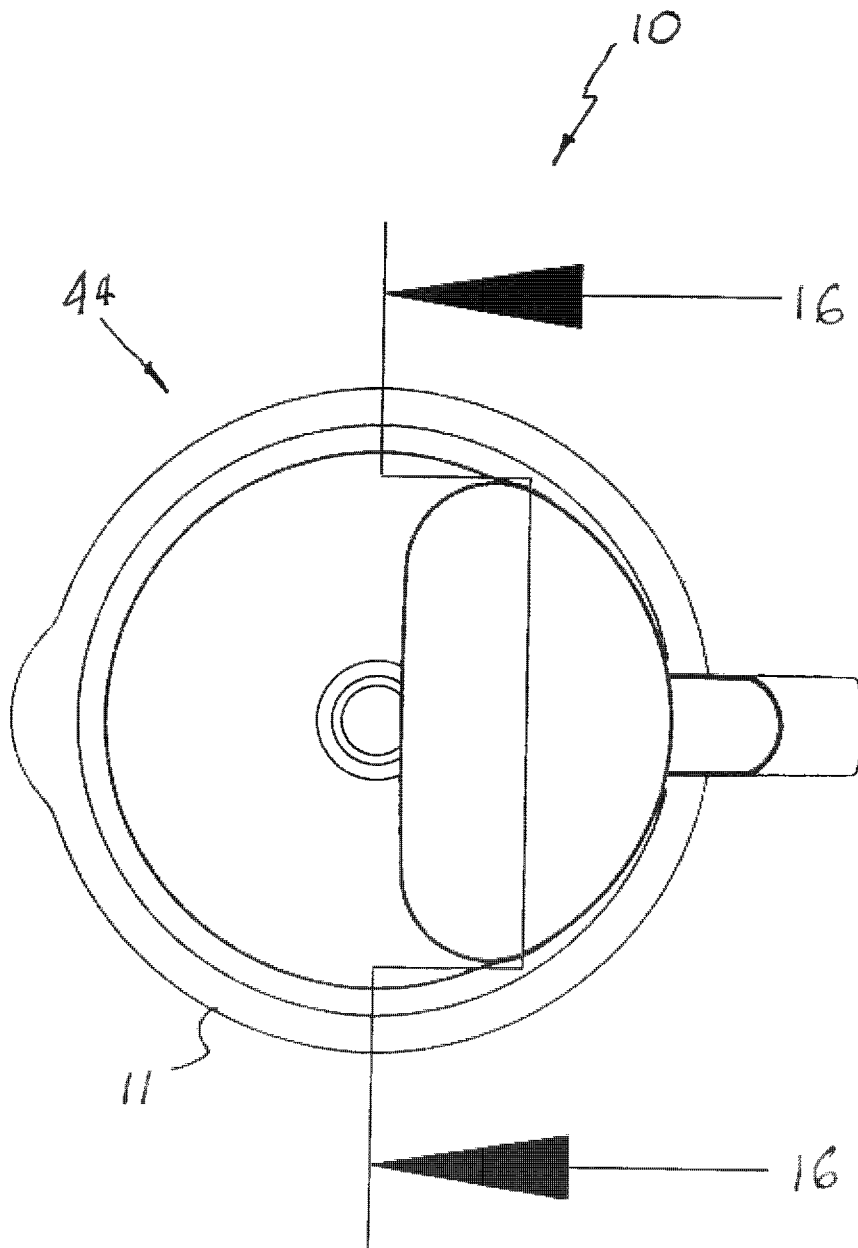


Fig 15

9/10

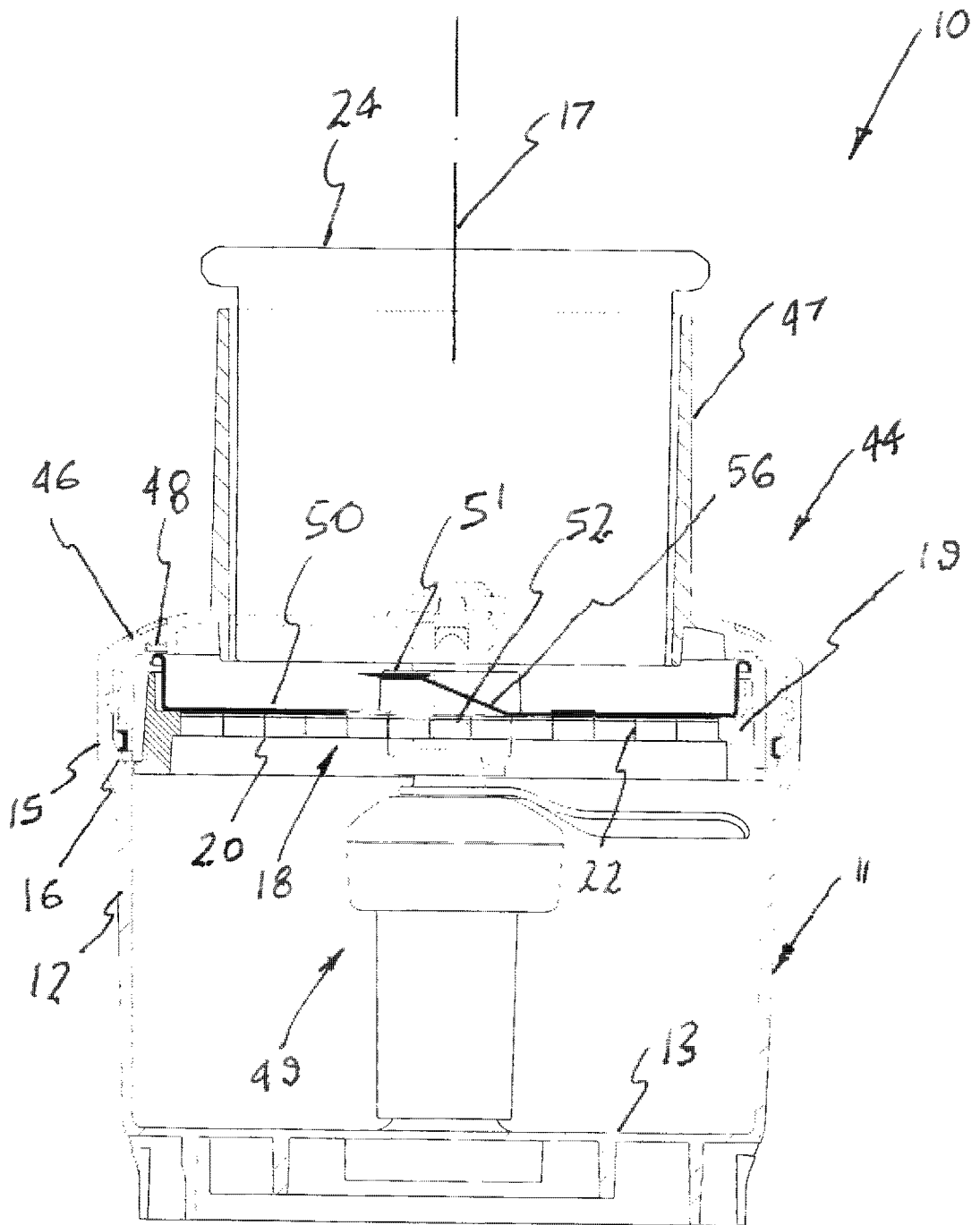


Fig 16



