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(54) Title: VALVE GUARD

(57) Abstract: A valve guard for a gas cylinder. The guard has a base and at least one cantilevered arm extending away from the base. The cantilevered arm is arranged to extend between the base portion and a position substantially in line with a centreline of the cylinder.

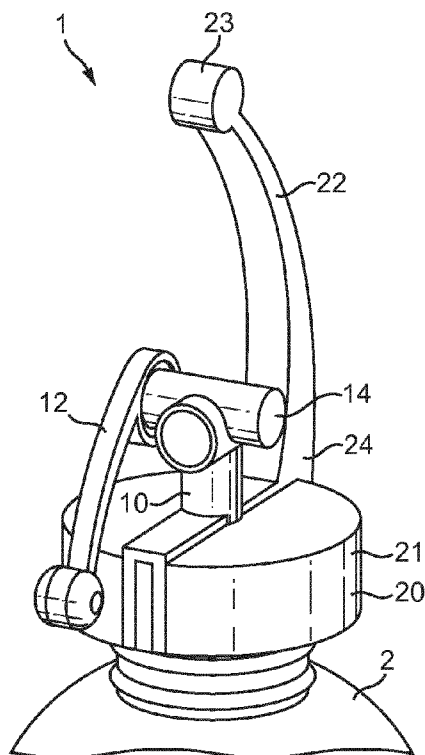


FIG. 1



WO 2014/187733 A2



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VALVE GUARD

The present invention relates to a valve guard. In particular, the present invention relates to a valve guard for a gas cylinder valve.

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Cylinder valve assemblies for gas cylinders and the like are well known. Traditionally, cylinder valves are provided with a hand wheel which is operable by rotation to open and close the valve. More recently, cylinder valves which use levers to operate the valve mechanism have become
10 known. Such a cylinder valve assembly is disclosed in US 5,975,121.

In order to prevent damage to valve assemblies during transit and/or use, it is common to provide a valve guard. Typically valve guards enclose the valve assembly to a certain extent to afford the necessary protection to
15 the valve. However, this can be problematic as the guard can reduce access to the valve operating mechanism and outlet.

An example prior art guard is disclosed in US 5,975,121 mentioned above. In this example the guard substantially surrounds the valve assembly
20 and slots are provided in the guard to allow actuation of the lever and access to the valve outlet. This enclosed valve guard arrangement significantly reduces access to the valve assembly and outlet. In particular, the enclosed guard hides the position of the actuating lever from certain lines of sight making it more difficult for an end user to ascertain whether the valve is open
25 or closed from a large range of angles around the cylinder.

The present invention provides a valve guard for a gas cylinder comprising a cylinder and valve assembly, the valve guard comprising a base portion and at least one cantilevered arm extending away from the base
30 portion, wherein, in use, the at least one cantilevered arm is arranged to extend between the base portion and a position substantially in line with a centreline of the cylinder.

- 2 -

The cantilevered arm provides protection to the valve assembly in the event that the cylinder is dropped or knocked over, whilst maintaining good access to the valve assembly and outlet. In addition, visibility of the valve actuation mechanism is substantially maintained allowing the user to
5 ascertain the position of the actuation mechanism from a large number of angles around the cylinder. This is particularly advantageous for lever operated valve assemblies.

The cantilevered arm preferably comprises a bulbous portion located at
10 the distal end of the cantilevered arm to help reduce impact damage to any other item that the guard may hit as it drops or falls over. The bulbous portion preferably comprises a churning knob to aid manual manipulation of the gas cylinder.

15 Preferably the base portion is of substantially concave form to provide side protection to the valve assembly.

A sidewall portion of the base portion preferably comprises an opening allowing access to the valve assembly and reducing weight of the valve
20 guard. The opening preferably defines a handle to aid manual handling of the gas cylinder.

In a preferred embodiment, a sidewall portion of the base portion comprises a raised portion to protect particularly delicate parts of the valve
25 assembly. The raised portion is preferably arranged to be located proximate an operating mechanism of the valve.

Preferably, the at least one cantilevered arm is generally of tapered form, tapering from the base portion towards its distal end. This provides
30 strength and stiffness at the base of the cantilevered arm which is most likely to fail during an impact.

- 3 -

The valve guard preferably comprises an alignment feature arranged to align with a selected alignment feature on the cylinder or valve to aid correct positioning of the guard on the gas cylinder in relation to the valve assembly.

- 5 In a preferred embodiment, the valve guard comprises at least two sections arranged, in use, to connect together in position around a valve assembly. This aids assembly of the guard around the valve assembly.

10 In another aspect, the present invention provides a kit of parts comprising a plurality of sections for forming a valve guard.

15 In a further aspect, the present invention provides a gas cylinder assembly comprising a gas cylinder, a valve assembly and a valve guard as described above.

 Examples of the invention will now be described with reference to the following drawings in which:

20 Figure 1 shows a schematic isometric view of a cylinder valve and valve guard assembly with the valve operating lever shown in the “off” position;

 Figure 2 shows a schematic isometric view of the cylinder valve and valve guard assembly of Figure 1 with the lever shown in the “open” position;

25 Figure 3 shows an isometric view of an alternative cylinder valve and valve guard assembly with the valve operating lever shown in the “off” position;

 Figure 4 shows an isometric view of the valve guard of Figure 3 in isolation; and

30 Figure 5 shows an alternative isometric view of the valve guard of Figure 4.

- 4 -

Referring to Figure 1, a cylinder and valve assembly 1 is shown comprising a gas cylinder 2, a valve assembly 10 and a valve guard 20. The valve assembly 10 is connected to the cylinder 2 by a threaded connection (not shown) as is well known in the art, and the guard 20 is connected to the neck ring of the cylinder by a threaded connection, also well known in the art. The valve assembly 10 comprises an actuation lever 12 and an outlet 14. In the position shown in Figure 1 the lever 12 is in the downward or "off" position such that gas is prevented from flowing from the outlet 14.

The valve guard 20 comprises a base portion 21 and a cantilevered arm 22 which extends from the base portion 21 to a distal end 23. The distal end 23 of the arm 22 has a bulbous form and the proximal end 24 of the arm has a thicker cross-section than the cross-section of the arm 22 immediately proximate the bulbous end 23. This configuration provides stiffness to the arm 22 in the region most likely to fail during an impact. The bulbous end 23 serves to reduce impact damage on any object struck by the end 23. The guard material may typically comprise, for example, cast metals, plastics or reinforced plastics.

The distal end of the cantilevered arm 22 extends to a position substantially above the centreline of the gas cylinder 2. The arm 22 therefore bends forward over the valve assembly 10. This configuration protects the valve assembly 10 from damage in the event that the cylinder valve assembly 1 is dropped or knocked over. The guard 20 is configured so that if the cylinder valve assembly 1 falls forwards or sideways, in the absence of projecting objects, the first point of contact will not be valve assembly 10 but either the base portion 21 or the arm 22 of the guard 20.

It is possible that the lever 12 may be damaged or broken off if the cylinder valve assembly 1 falls over. However, the guard 20 will protect the valve from impacts which may damage the valve and lead to loss of the valve from the cylinder 2.

- 5 -

Figure 2 shows the lever 12 of the valve assembly in the raised or “open” position. As can be seen in both figures 1 and 2, the valve guard allows almost 360° access to the lever 12 and outlet 14. Thus the end user is able to access both the lever 12 and outlet 14 from a large number of angles and is not unduly restricted by the guard 20. In addition, as best shown in Figure 2, the position of the lever 12 is easily viewed from the large majority of directions around the cylinder valve assembly 1, thus allowing the end user to readily ascertain if the valve 10 is open or closed from a larger number of locations.

Figure 3 shows an alternative cylinder valve assembly 50. As above, the cylinder valve assembly 50 comprises a gas cylinder 52, a valve assembly 60 and a valve guard 70. The valve assembly 60 comprises an actuating lever 62 and an outlet 64.

The guard 70 comprises a base portion 71 and a cantilevered arm 72. As best seen in Figures 4 and 5, the base portion 71 is generally of concave form and has two openings 75 and 76 provided therein. Although generally of concave form, as shown in Figure 3, the large majority of the base portion 71 is located below the valve assembly 60 thereby maintaining access to the valve assembly and outlet 64.

In addition, the base portion 71 comprises a raised side wall 74. The arm 72 extends from the base portion 71 to a distal end 73. A churning knob 80 is located at the distal end 73 of the arm 72. The cantilevered arm 72 is generally of tapered form, tapering from the base portion 71 towards its distal end 73.

To allow the guard 70 to be fitted to the valve assembly 60 when the valve assembly is in place on the gas cylinder 52, the guard 70 is fabricated in two pieces 91 and 92. Bolt holes 78 are provided in each half 91, 92 and, in use, the two halves are held in place by bolts 78. The assembled guard 70

- 6 -

thus comprises a split line 90. The guard material may typically comprise, for example, cast metals, plastics or reinforced plastics.

When the valve guard 70 is in place around the valve assembly 60, the
5 side wall 74 is located proximate the lever 62 of the valve assembly (Figure 3). This affords protection to the lever 62 from side impacts while not unduly limiting the visibility of the lever 62. As shown, because the lever 62 projects beyond the side wall 74, the downward or "off" position of the lever 62 can still be seen by a user observing the valve assembly 60 from the opposite side of
10 the wall 74.

In use, opening 75 in the guard 70 is arranged to be located behind the valve assembly 60 to allow access to a valve inspection point (not shown). Opening 76 in the guard 70 provides a handle for end users when
15 manipulating the cylinder valve assembly 50. In addition, openings 75 and 76 provide weight savings and material savings, the material saving in particular providing cost savings. If desired the side wall 74 may have an opening to provide an additional grasp point and to provide additional weight saving.

20 The cantilevered arm 72 resides substantially behind the valve assembly 60 at its proximal end 81 and extends to a position substantially above the centreline of the cylinder 52 at its distal end 73. The arm 72 therefore bends forward over the valve assembly 60. This configuration protects the valve assembly 60 from damage in the event that the cylinder
25 valve assembly 50 is dropped or knocked over. The guard 70 is configured so that if the cylinder valve assembly 50 falls forwards or sideways, in the absence of projecting objects, the first point of contact will not be the valve assembly 60 but either the base portion 71 or the arm 72 of the guard 70.

30 It is possible that the lever 62 may be damaged or broken off if the cylinder valve assembly 50 falls over. However, the guard 70 will protect the

- 7 -

valve from impacts which may damage the valve and lead to loss of the valve from the cylinder 52.

5 In the arrangement of Figure 3, it is important that the features of the guard 70 align with corresponding features of the valve assembly 60. For example wall 74 needs to be located proximate the lever 62, and opening 75 needs to be located behind the valve assembly 60. To ensure correct alignment, the guard 70 may be provided with an alignment feature (not shown).

10

It will be understood that relative terms such as "above", "behind" etc. used in the proceeding description are relative to the valve assembly 60 when in place on the cylinder 52 during normal use with the cylinder 52 upright. The front 65 of the valve assembly 60 is that closest to the distal end 63 of the lever 62 when the lever 62 is in the downward or "off" position.

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It will be understood that the invention may be applied to any type of cylinder and valve arrangement including liquid storage cylinders.

- 8 -

Claims:

1. A valve guard for a gas cylinder comprising a cylinder and valve assembly, the valve guard comprising a base portion and at least one
5 cantilevered arm extending away from the base portion, wherein, in use, the at least one cantilevered arm is arranged to extend between the base portion and a position substantially in line with a centreline of the cylinder.
2. A valve guard as claimed in claim 1 comprising a bulbous portion
10 located at the distal end of the at least one cantilevered arm.
3. A valve guard as claimed in claim 2, wherein the bulbous portion comprises a churning knob.
- 15 4. A valve guard as claimed in any preceding claim, wherein the base portion is of substantially concave form.
5. A valve guard as claimed in claim 4, wherein a sidewall portion of the base portion comprises an opening.
20
6. A valve guard as claimed in claim 5, wherein the opening defines a handle.
7. A valve guard as claimed in any one of claims 4, 5 or 6, wherein a
25 sidewall portion of the base portion comprises a raised portion.
8. A valve guard as claimed in claim 7, wherein the raised portion is arranged, in use, to be located proximate an operating mechanism of the valve.

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- 9 -

9. A valve guard as claimed in any preceding claim, wherein the at least one cantilevered arm is generally of tapered form, tapering from the base portion towards its distal end.
- 5 10. A valve guard as claimed in any preceding claim, comprising an alignment feature arranged, in use, to align with a selected alignment feature on the cylinder or valve.
- 10 11. A valve guard as claimed in any preceding claim, wherein the valve guard comprises at least two sections arranged, in use, to connect together in position around a valve assembly.
12. A kit of parts comprising a plurality of sections for forming a valve guard according to claim 11.
- 15 13. A gas cylinder assembly comprising a gas cylinder, a valve assembly and a valve guard according to any one of the preceding claims.

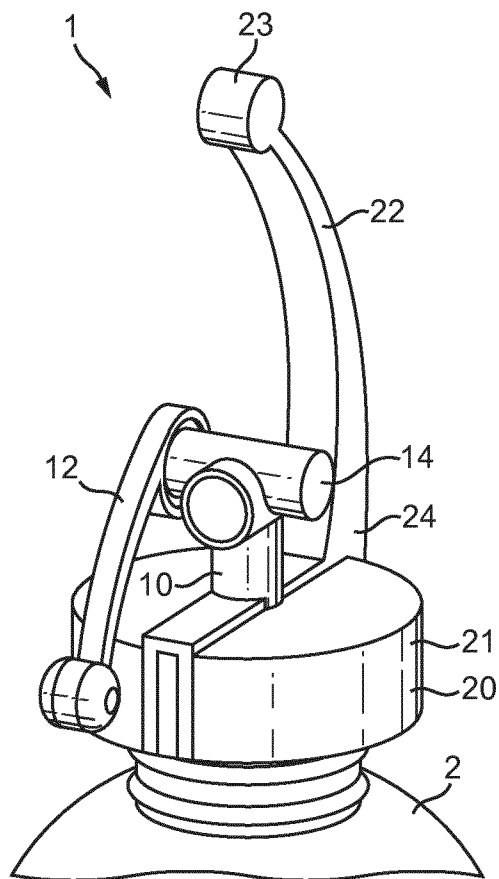


FIG. 1

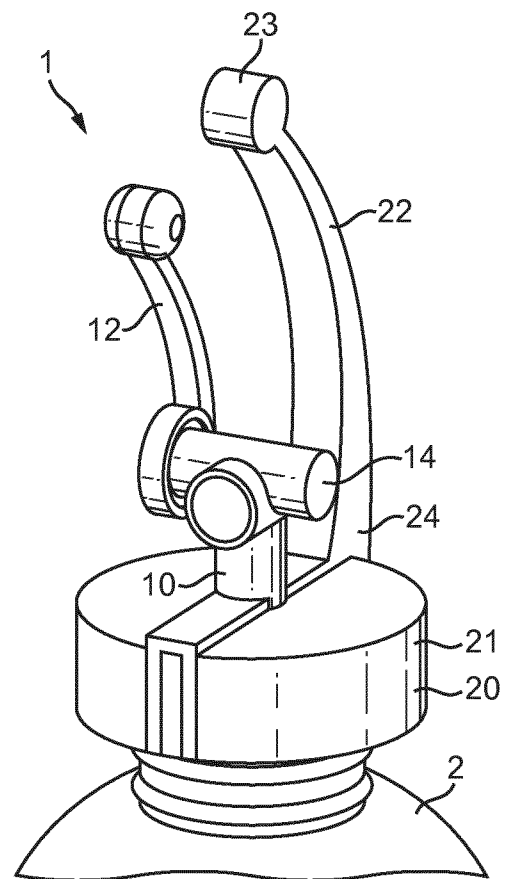


FIG. 2

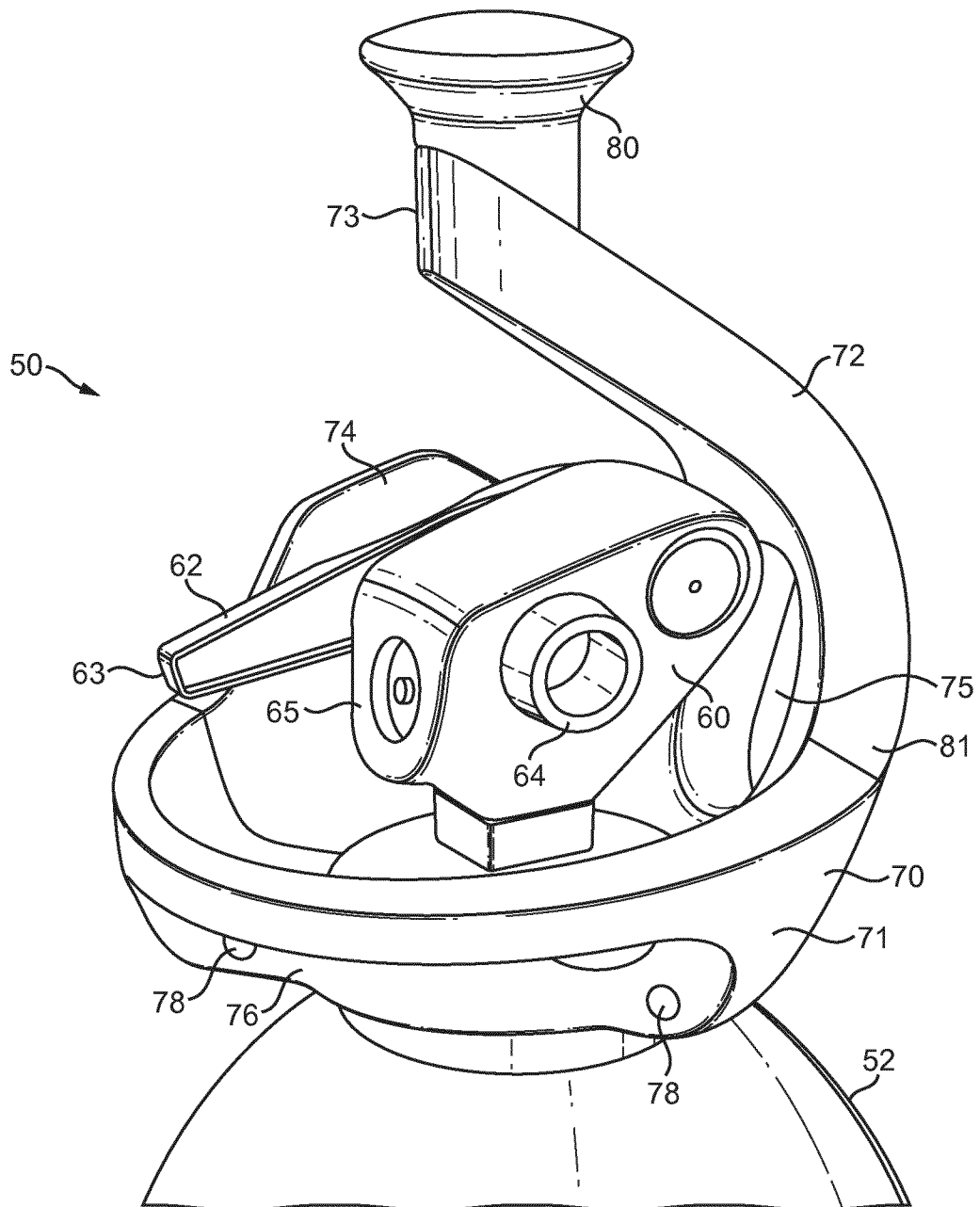


FIG. 3

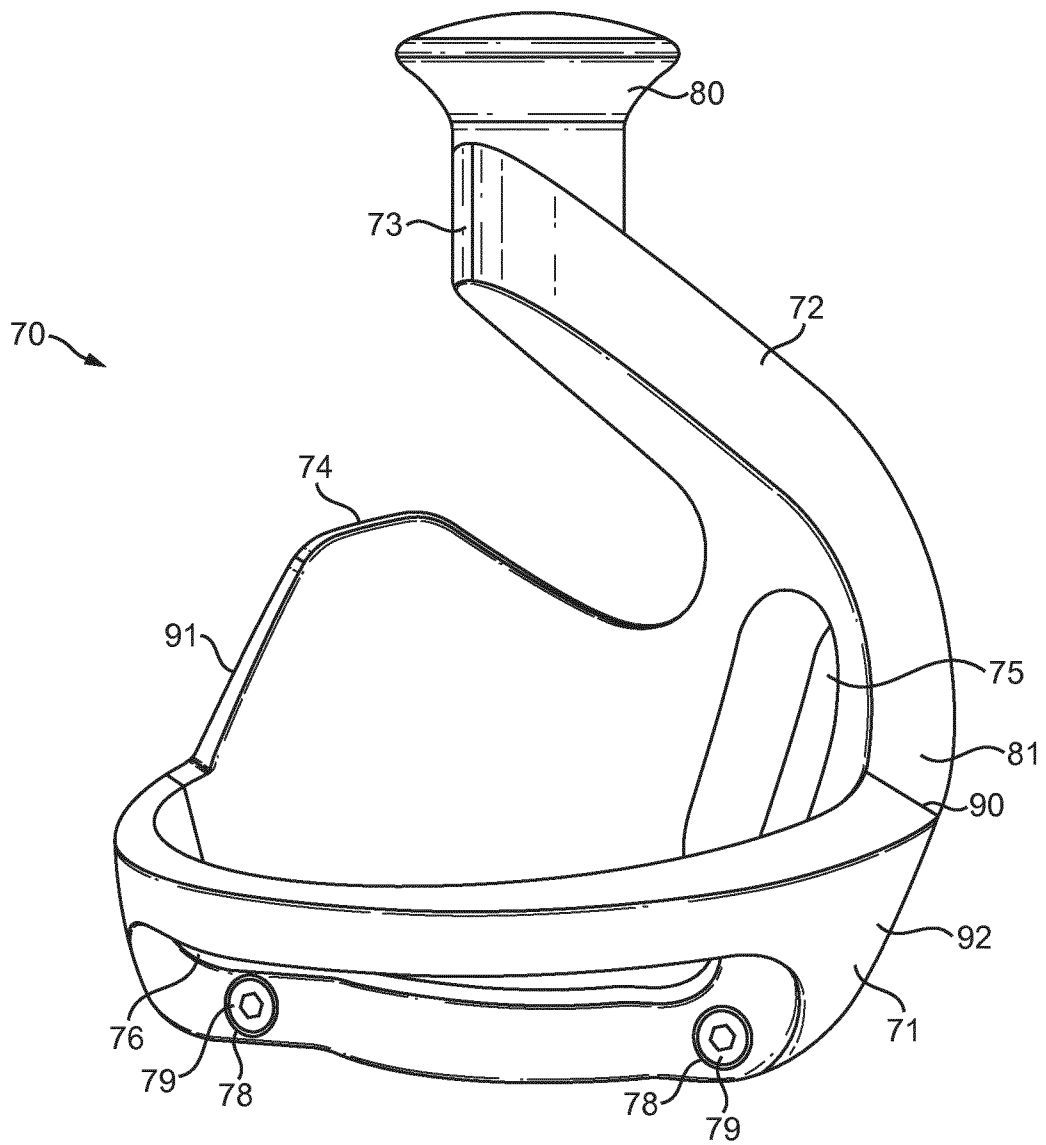


FIG. 4

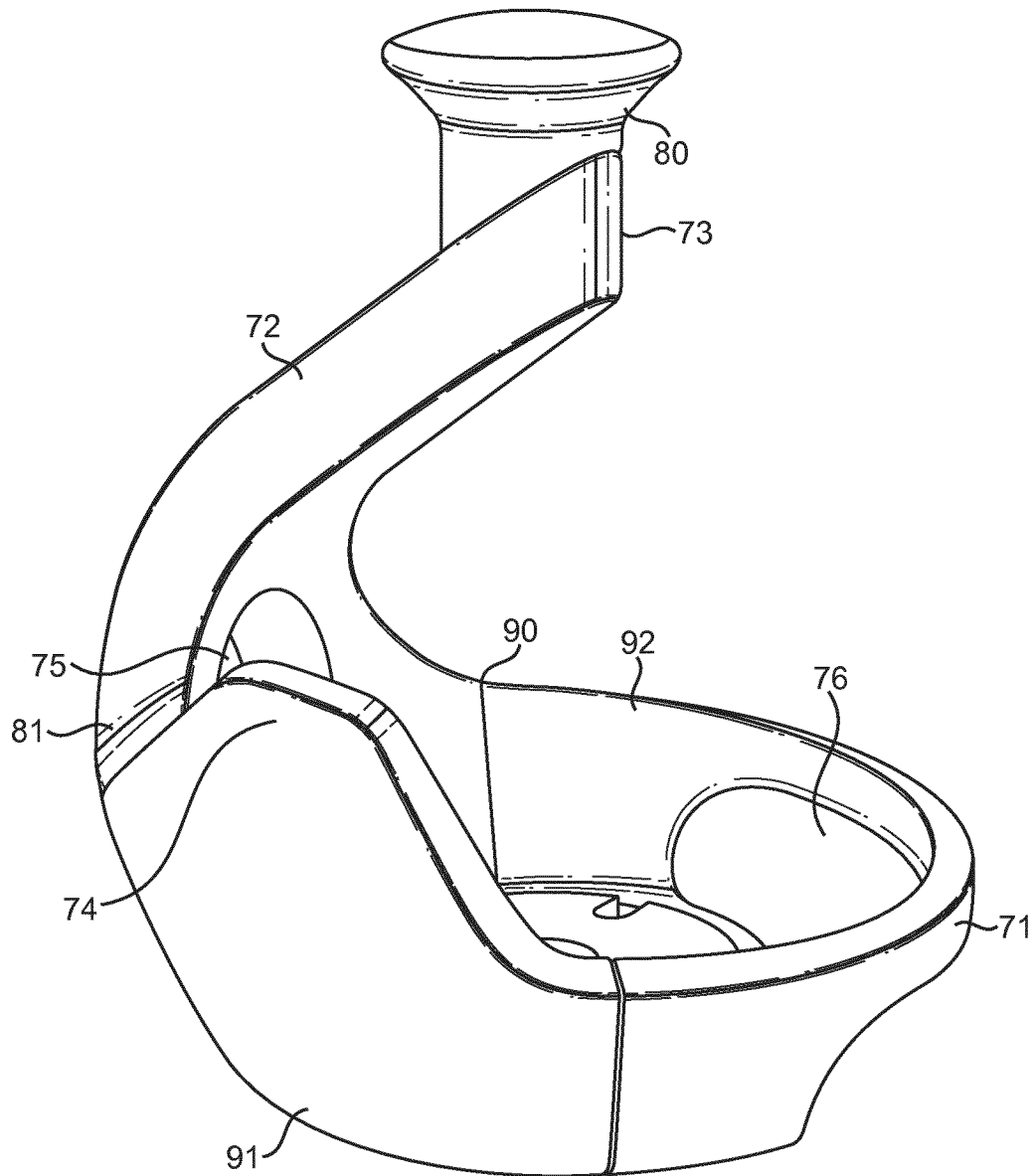


FIG. 5