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(54) Title: ACOUSTIC ASSEMBLY, KIT AND METHOD OF USING SAME

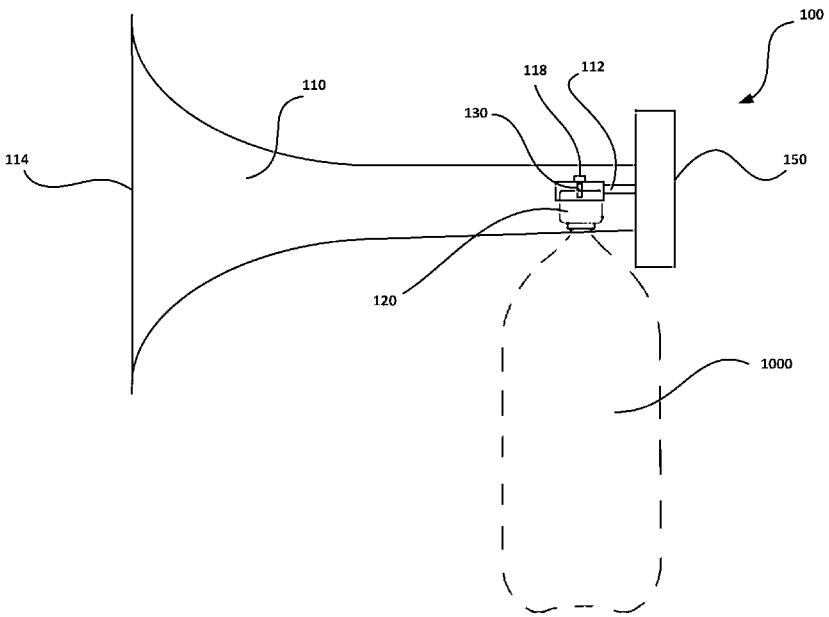

FIGURE 1

(57) Abstract: An acoustic assembly, a kit and a method of using the acoustic assembly is disclosed. In a first aspect the acoustic assembly includes: a fluid operated noisemaker including a noisemaker inlet; and a closure for closing an opening of a container containing a carbonated beverage, wherein the closure includes a valve which is selectively movable from a closed position to an open position, wherein: in the open position the container is in fluid communication with the noisemaker inlet via the valve, wherein at least some pressurised gas contained within the container flows through the noisemaker inlet thereby causing a noise to be emitted by the fluid operated noisemaker; and in the closed position the noisemaker inlet is restricted from being in fluid communication with the container.

[Continued on next page]

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ACOUSTIC ASSEMBLY, KIT AND METHOD OF USING SAME

Field of Invention

[001] The present invention relates to noisemakers.

Background

[002] Noisemakers such as acoustic devices are prevalent at events which attract crowds.

[003] Devices such as trumpets and the like may be taken by crowd members in order to provide entertainment throughout the event. Generally these types of noisemakers require a user to learn a playing technique in order to correctly operate the noisemaker.

[004] Other types of noisemakers can be operated without significant skill. For example, at the 2009 FIFA Confederations Cup and the 2010 FIFA World Cup, vuvuzelas were used by the crowd. A vuvuzela is a plastic horn which generally produces a loud monotone note. Depending upon the blowing technique and pressure exerted by the user at the mouthpiece, the monotone note may vary in intensity and frequency. Generally, in large crowds, the noise produced by the crowd using vuvuzelas can be substantial and constant.

[005] A problem encountered during such events was noise-induced hearing loss for the crowd. A study has shown that subjects should not be exposed to more than 15 minutes per day at an intensity of 100 dB(A). As vuvuzelas are operated by users blowing into the mouthpiece, it is difficult for event coordinators to control the amount of time that a subject is exposed to such an intense noise for such a period of time. Some events have placed bans on noisemakers such as vuvuzelas in light of such recommendations.

[006] Therefore, there is a need to alleviate one or more of the above mentioned problems or provide a useful alternative.

[007] The reference in this specification to any prior publication (or information derived from it), or to any matter which is known, is not, and should not be taken as, an acknowledgement or admission or any form of suggestion that that prior publication (or

information derived from it) or known matter forms part of the common general knowledge in the field of endeavour to which this specification relates.

Summary

[008] In a first aspect there is provided an acoustic assembly including:

a fluid operated noisemaker including a noisemaker inlet;

a closure for closing an opening of a container containing a carbonated beverage, wherein the closure includes a valve which is selectively movable from a closed position to an open position, wherein:

in the open position the container is in fluid communication with the noisemaker inlet via the valve, wherein at least some pressurised gas contained within the container flows through the noisemaker inlet thereby causing a noise to be emitted by the fluid operated noisemaker; and

in the closed position the noisemaker inlet is restricted from being in fluid communication with the container.

[009] In certain embodiments, the fluid operated noisemaker is connected to the closure.

[010] In certain embodiments, the fluid operated noisemaker is separate to the closure such that the closure is co-operable with the fluid operated noisemaker such that the valve outlet is locatable in fluid communication with the noisemaker inlet.

[011] In certain embodiments, the closure includes a screw cap arrangement having a skirt that extends downwardly from a top wall, wherein the valve inlet extends from an underside surface of the top wall and the valve outlet extends from a top surface of the top wall.

[012] In certain embodiments, the valve is adhesively secured to the screw cap arrangement.

[013] In certain embodiments, the valve is crimpedly secured to the screw cap arrangement.

[014] In certain embodiments, the valve is integrated with the screw cap arrangement.

[015] In certain embodiments, the noisemaker includes one of an aerophone, a membranophone, or a horn including a vibratable membrane.

[016] In certain embodiments, the valve includes a biasing element to bias the valve to the closed position.

[017] In certain embodiments, the fluid operated noisemaker can include a closure mounting portion configured to mount the closure to the fluid operated noisemaker, a diaphragm chamber portion and a neck portion.

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[018] In certain embodiments, the closure mounting portion includes a cavity which at least partially houses the closure.

[019] In certain embodiments, an inner surface of the closure has extending therefrom a cylindrical wall in fluid communication with a conduit, wherein the cylindrical wall receives therein a stem of the valve and directs the pressurised gas through the conduit.

[020] In certain embodiments, the closure port includes a depressable button to allow a force to be applied to the stem of the valve to move the valve to the open position.

[021] In certain embodiments, an outlet port of the conduit of the closure mounting portion releasably couples to an inlet port of the diaphragm chamber portion.

[022] In certain embodiments, the diaphragm chamber portion includes an outlet port which releasably couples to an inlet port of the neck portion.

[023] In certain embodiments, the diaphragm chamber includes a membrane which vibrates according to the intake of fluid via the inlet, wherein the vibration causes the generation of the emitted sound.

[024] In certain embodiments, the valve inlet is protected via a shield which restricts carbonated beverage being transferred by the valve inlet into the fluid operated noisemaker.

[025] In certain embodiments, the shield includes a neck having a series of small holes defining the valve inlet which receive and transfer pressurised gas built up within the container when the valve is operating in the open position.

[026] In certain embodiments, the shield has an upside-down dome shaped profile which extends downwardly via the neck.

[027] In certain embodiments, a circumferential edge of the shield is spaced from a wall of the closure defining a narrow gap to allow pressurised gas to pass through the gap and into the valve via the holes.

[028] In another aspect there is provided a method of using an acoustic assembly configured according to the first aspect, wherein the method includes:

closing the opening of a container using the closure, wherein the valve is in the closed position such that a pressure exerted upon the container increases due to the carbonated beverage; and

selectively actuating the valve to the open position to thereby generate the noise emitted via the noisemaker outlet.

[029] Other aspects and embodiments will be appreciated throughout the detailed description of the examples.

Brief Description of Drawings

[030] Example embodiments should become apparent from the following description, which is given by way of example only, of at least one preferred but non-limiting embodiment, described in connection with the accompanying figures.

[031] Figure 1 is a schematic of an example acoustic assembly coupled to a container;

[032] Figure 2A is a perspective view showing the top surface of an example closure;

[033] Figure 2B is a perspective view showing the underside surface of the closure of Figure 2A;

[034] Figure 2C is a cross-section diagram of the closure of Figure 2A;

[035] Figure 2D is an alternate example of a closure;

[036] Figure 3A is an side view of an example fluid operated noisemaker of the acoustic assembly;

[037] Figure 3B is a top view of the fluid operated noisemaker of Figure 3A;

[038] Figure 3C is a bottom view of the fluid operated noisemaker of Figure 3A;

[039] Figure 3D is a perspective view of the fluid operated noisemaker of Figure 3A in a dismantled state;

[040] Figure 4 is a perspective view of a plurality of alternate examples of acoustic assemblies;

[041] Figure 5 is a flowchart representing a method of using an acoustic assembly; and

[042] Figure 6 is a magnified view of a shield assembly for a valve.

Description of Embodiments

[043] The following modes, given by way of example only, are described in order to provide a more precise understanding of the subject matter of a preferred embodiment or embodiments. In the figures, incorporated to illustrate features of an example embodiment, like reference numerals are used to identify like parts throughout the figures.

[044] Referring to Figure 1 there is shown an example of an acoustic assembly 100. The acoustic assembly 100 includes a fluid operated noisemaker 110 and a closure 120.

[045] The "fluid operated noisemaker" is a device that produces sound primarily by causing a body of gas or a membrane to vibrate. The noise is generated using fluid dynamic properties of the device. Examples include an aerophone such as a whistle, a membranophone, a horn including a membrane which vibrates according to a pressurised body of gas, or the like. It will be appreciated that such devices are limited to operation using only air but can be operated using a fluid such other gases, for example carbon dioxide.

[046] The fluid operated noisemaker 110 includes a noisemaker inlet 112 and a noisemaker outlet 114. The closure 120 is configured for closing an opening of a container 1000.. The closure 120 includes a valve 130 which can be selectively moved from a closed position to an open position.

[047] In one example, the container can be a soft drink container such as a bottle having a screw thread neck 1010 and the closure 120 is a screw cap arrangement which can releasably engage and secure to the screw thread neck 1010 (see Figure 2C).

[048] In the open position, the container 1000 is in fluid communication with the noisemaker inlet 112 via the valve 130, wherein at least some pressurised gas contained within the container 1000 flows into the fluid operated noisemaker 110 via the noisemaker inlet 112 thereby causing a noise to be emitted by the fluid operated noisemaker 110 via the outlet 114. In the closed position the noisemaker inlet 112 is restricted from being in fluid communication with the container 1000. In particular, in the closed position, no gas contained within the container 1000 flows from the container 1000 into the fluid operated noisemaker 110 via the valve 120 and noisemaker inlet 112 such that no noise is emitted by the fluid operated noisemaker 110 via the noisemaker outlet 114.

[049] Due to the acoustic assembly 100 being operated using the flow of gas released from the container 1000, the user does not need to learn a particular technique to operate the acoustic assembly 100. Furthermore, in embodiments where the container contains a carbonated beverage, the period of time which the sound is emitted from the acoustic assembly 100 is relatively short (e.g. between 1 to 5 seconds) for a typical soft drink bottle having a volume between 300ml to 1 litre. Furthermore, as the carbonated beverage will eventually go

flat over time and/or after being agitated to increase the pressure exerted upon the container, the amount of time which the sound can be exerted using the container is limited. Generally, during experiments, it has been found that the approximately 10 activations of the acoustic assembly 100 can be achieved using a bottle containing approximately 600ml of carbonated beverage.

[050] In certain embodiments, the fluid operated noisemaker 110 is permanently connected to the closure 120. For example, the fluid operated noisemaker 110 may be integral with the closure 120 or the closure 120 may be adhesively secured to the fluid operated noisemaker 110.

[051] In other embodiments, the fluid operated noisemaker 110 may be a separate component to the closure 120. In such an arrangement, the closure 120 is co-operable with the fluid operated noisemaker 110 such that the valve outlet 134 is locatable in fluid communication with the noisemaker inlet 112. In this arrangement, a user may initially close the container 1000 with the closure 120, and then locate the fluid operated noisemaker 110 relative to the closure 120 such that the valve outlet 134 is in communication with the noisemaker inlet 112.

[052] As shown in Figures 2A, 2B and 2C, the closure 120 has a screw cap arrangement having a skirt that extends downwardly from a top wall. The valve inlet 132 can extend from an underside surface of the top wall and the valve outlet 134 can extend from a top surface of the top wall. As shown in Figure 2C, the top wall of the screw cap arrangement can include a hole, wherein a mounting flange 136 of the valve 130 is secured to the underside surface and/or the top surface of the screw cap arrangement thereby sealing over the hole. The mounting flange 136 of the valve 130 can be adhesively secured to the screw cap arrangement or crimpedly secured to the screw cap arrangement. The valve 130 can include a protruding section 138 which protrudes through the hole of the top surface of the screw cap arrangement and seals with the edges of the hole.

[053] As shown in Figure 2C, the valve 130 can include a biasing element 135 such as a spring to bias the valve to the closed position. In particular, the valve can be configured similarly to an aerosol valve wherein when a user applied a force sufficient to compress the

spring 135 via a stem 139 of the valve outlet, the valve outlet moves to the open position. Once the user removes the sufficient force, the spring 130 biases the valve to a closed position.

[054] In an alternative embodiment as shown in Figure 2D, the valve 130 can be integrated with the screw cap arrangement 120. For example, the closure 120 may be substantially plastic wherein the valve 130 is mounted into the screw cap arrangement 120. The mounting geometry is moulded into a custom plastic bottlecap.

[055] Referring to Figures 3A, 3B and 3C there is shown various views of the fluid operated noisemaker 110. In certain embodiments, the fluid operated noisemaker can include a plurality of components which connect together to form the fluid operated noisemaker. In particular, the fluid operated noisemaker 110 can include a closure mounting portion 116, a diaphragm chamber portion 117 and a neck portion 115.

[056] The closure mounting portion 116 can releasably or permanently mount the closure 120 to the fluid operated noisemaker 115 depending upon the specific arrangement utilised. As shown in Figure 3C, the closure mounting portion includes a cavity which at least partially houses the closure 120. The inner surface of the closure has extending therefrom a cylindrical wall in fluid communication with a conduit 390, wherein the cylindrical wall receives therein the stem 139 of the valve and directs the pressurised gas through the conduit 390. As shown in Figure 3B, the closure port includes a depressable button to allow a user to apply a force to the stem 139 of the valve 130 to move the valve to the open position.

[057] An outlet port 200 of the conduit 390 of the closure mounting portion releasably couples to an inlet port 310 of the diaphragm chamber portion 117.The diaphragm chamber portion 117 also includes an outlet port 210 which releasably couples to an inlet port 300 of the neck portion 115. In this particular example, the diaphragm chamber includes a membrane which vibrates according to the intake of fluid via the inlet, wherein the vibration causes the generation of the emitted sound.

[058] As the fluid operated noisemaker of Figures 3A to 3D can comprise of separable portions, it is possible to provide a kit including a plurality of neck portions 117 and/or a plurality of diaphragm chamber portions 117 which can be coupled together with the closure

mounting portion 116 to alter the pitch/tune emitted by the fluid operated noisemaker 115. Referring to Figure 4 there are shown various fluid operated noisemaker 100A to 100F. In particular, the kit may include differently profiled neck portions 115 and differently profiled diaphragm chamber portions 117. Additionally or alternatively, the membranes of the diaphragm chamber portions 117 may have different thicknesses, be under different tensions and/or made from different materials in order to alter the sounds generated.

[059] In certain embodiments, the neck portion 115 can include a sliding section to enable an adjustable pitch. In another embodiment, the neck portion 115 can be flexible. In another embodiment, the neck portion 115 can include a convoluted profile similar to a trumpet.

[060] Whilst Figure 3D shows a disassembled arrangement of the fluid operated noisemaker 110, it will be appreciated that the fluid operated noisemaker 115 is provided in an integrated form such that the closure mounting portion 116, the diaphragm chamber portion 117 and the neck portion 115 are permanently secured together.

[061] Referring to Figure 5 there is shown a flowchart representing a method 500 of using the acoustic assembly 100.

[062] In particular, at step 510 the method 500 includes closing the opening of a container 1010 using the closure 120, wherein the valve 130 is in the closed position so that there is an increase of pressure exerted upon the container 1010 over time. In particular, the user may agitate the bottle containing the carbonated beverage via shaking after closing the closure in order to cause a pressure change exerted upon the walls of the container. However, it will be appreciated that it may not be necessary for the user to agitate the container 1010 as the pressure may increase within the container over a longer period of time due to other changes in the environment such as a change in temperature.

[063] At step 520 the method 500 includes selectively actuating the valve to the open position to thereby generate the noise emitted via the fluid operated noisemaker 100. In the event that the user wishes to emit a further sound from the fluid operated noisemaker 110 and a further change in pressure exerted upon the bottle is possible (e.g. the beverage is not flat),

the user lets the valve return to the closed position at step 530 such that the pressure can increase within the container. Step 520 can then be performed again.

[064] It will be appreciated that in the event that a separate fluid operated noisemaker 110 and closure 120 is utilised, the closure 120 can be used to initially close the container 1000 and then the closure 120 can be located within the cavity of the closure mounting portion 116 of the acoustic assembly 100 such that gas can flow from the container 1000 into the acoustic assembly 100.

[065] In one variation, the valve inlet 132 may be protected via a shield 605 which restricts carbonated beverage being transferred by the valve inlet 132 into the fluid operated noisemaker 110 which may not operate correctly or as well. Referring to Figure 5 there is shown an example shield assembly 600 of the closure 120. The shield assembly includes a neck 640 having a series of small holes 620 acting as the valve inlet 132 which receive and transfers pressurised gas built up within the container 1000 when the valve 130 is operating in the open position. The shield 600 includes an upside-down dome shaped shield 605 which extends downwardly via the neck 640 from the underside surface of the top wall of the closure 120. A circumferential edge of the shield 600 is spaced from the underside surface of the top wall 122 of the closure 120 defining a narrow gap 610 to allow pressurised gas to pass through the gap 610 and into the valve 130 via the holes 620. The gap 610 restricts carbonated beverage easily passing into the valve 120 during agitation. The holes 620 are generally located close to underside surface of the top wall 122 of the closure 120 such that if a small amount of carbonated beverage were to pass through the narrow gap 120, the small amount of liquid is likely to pool at the bottom of where the dome shield 605 and neck 640 meet which is located away from the top of the neck 640 where the holes 620 are located.

[066] Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", and variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

[067] Many modifications will be apparent to those skilled in the art without departing from the scope of the present invention.

The claims of the present invention are as follows:

1. An acoustic assembly including:

a fluid operated noisemaker including a noisemaker inlet;

a closure for closing an opening of a container containing a carbonated beverage, wherein the closure includes a valve which is selectively movable from a closed position to an open position, wherein:

in the open position the container is in fluid communication with the noisemaker inlet via the valve, wherein at least some pressurised gas contained within the container flows through the noisemaker inlet thereby causing a noise to be emitted by the fluid operated noisemaker; and

in the closed position the noisemaker inlet is restricted from being in fluid communication with the container.

2. The acoustic assembly of claim 1, wherein the fluid operated noisemaker is connected to the closure.

3. The acoustic assembly of claim 1, wherein the fluid operated noisemaker is separate to the closure such that the closure is co-operable with the fluid operated noisemaker such that the valve outlet is locatable in fluid communication with the noisemaker inlet.

4. The acoustic assembly according to claim 1 or 2, wherein the closure includes a screw cap arrangement having a skirt that extends downwardly from a top wall, wherein the valve inlet extends from an underside surface of the top wall and the valve outlet extends from a top surface of the top wall.

5. The acoustic assembly according to claim 3, wherein the valve is adhesively secured to the screw cap arrangement.

6. The acoustic assembly according to claim 3, wherein the valve is crimpedly secured to the screw cap arrangement.

7. The acoustic assembly according to claim 3, wherein the valve is integrated with the screw cap arrangement.

8. The acoustic assembly according to any one of claims 1 to 7, wherein the noisemaker includes one of an aerophone, a membranophone, or a horn including a vibratable membrane.

9. The acoustic assembly according to any one of claims 1 to 8, wherein the valve includes a biasing element to bias the valve to the closed position.

10. The acoustic assembly according to any one of claims 1 to 9, wherein the fluid operated noisemaker can include a closure mounting portion configured to mount the closure to the fluid operated noisemaker, a diaphragm chamber portion and a neck portion.

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11. The acoustic assembly according to claim 10, wherein the closure mounting portion includes a cavity which at least partially houses the closure.

12. The acoustic assembly according to claim 10, wherein an inner surface of the closure has extending therefrom a cylindrical wall in fluid communication with a conduit, wherein the cylindrical wall receives therein a stem of the valve and directs the pressurised gas through the conduit.

13. The acoustic assembly according to claim 12, wherein the closure port includes a depressable button to allow a force to be applied to the stem of the valve to move the valve to the open position.

14. The acoustic assembly according to claim 12 or 13, wherein an outlet port of the conduit of the closure mounting portion releasably couples to an inlet port of the diaphragm chamber portion.

15. The acoustic assembly according to any one of claims 10 to 14, wherein the diaphragm

chamber portion includes an outlet port which releasably couples to an inlet port of the neck portion.

16. The acoustic assembly according to any one of claims 10 to 15, wherein the diaphragm chamber includes a membrane which vibrates according to the intake of fluid via the inlet, wherein the vibration causes the generation of the emitted sound.

17. The acoustic assembly according to any one of claims 1 to 15, wherein the valve inlet is protected via a shield which restricts carbonated beverage being transferred by the valve inlet into the fluid operated noisemaker.

18. The acoustic assembly according to claim 17, wherein the shield includes a neck having a series of small holes defining the valve inlet which receive and transfer pressurised gas built up within the container when the valve is operating in the open position.

19. The acoustic assembly according to claim 18, wherein the shield has an upside-down dome shaped profile which extends downwardly via the neck.

20. The acoustic assembly according to claim 19, wherein a circumferential edge of the shield is spaced from a wall of the closure defining a narrow gap to allow pressurised gas to pass through the gap and into the valve via the holes.

21. A method of using an acoustic assembly configured according to any one of claims 1 to 20, wherein the method includes:

closing the opening of a container using the closure, wherein the valve is in the closed position such that a pressure exerted upon the container increases due to the carbonated beverage; and

selectively actuating the valve to the open position to thereby generate the noise emitted by the fluid operated noisemaker.

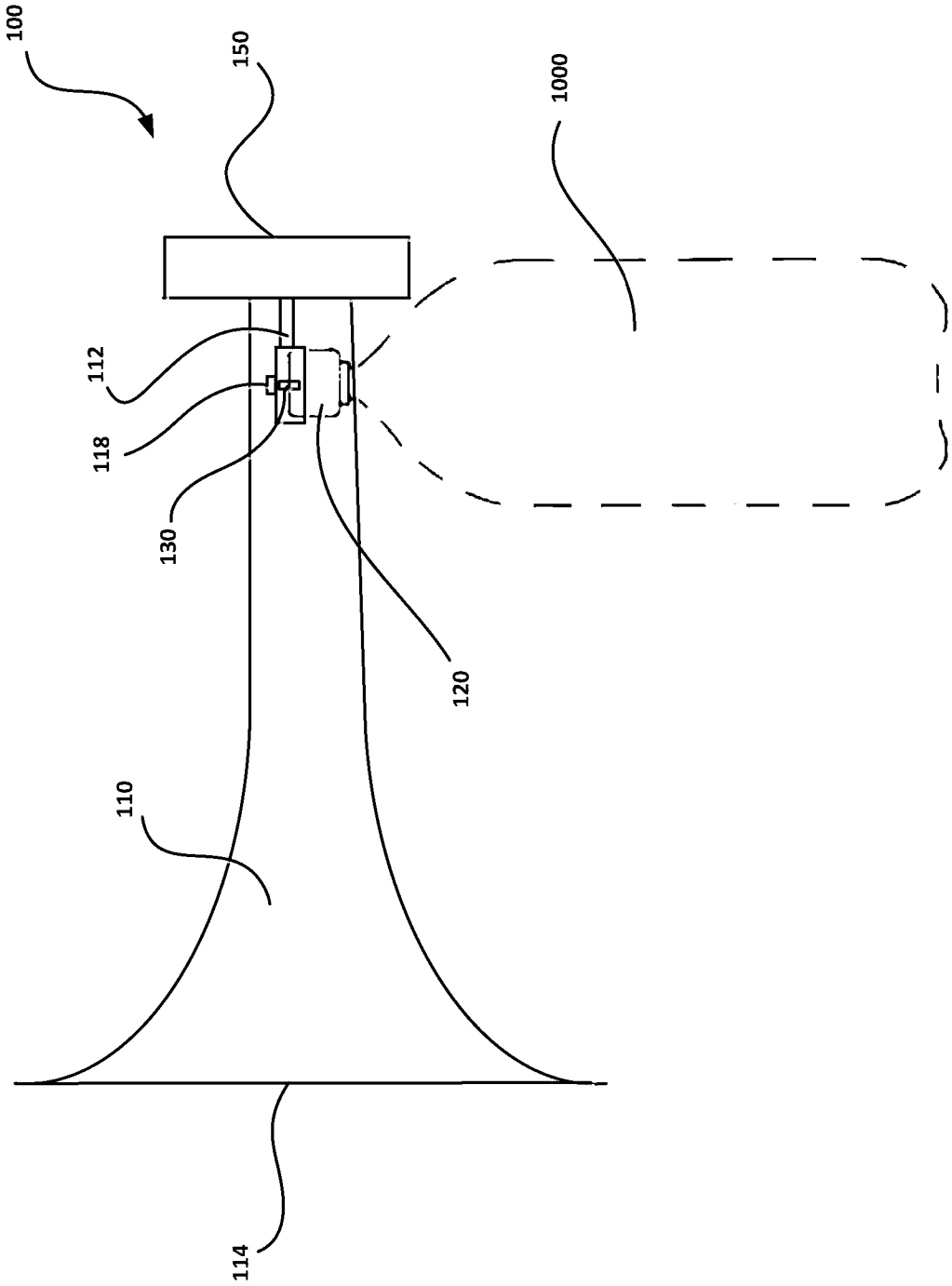

FIGURE 1

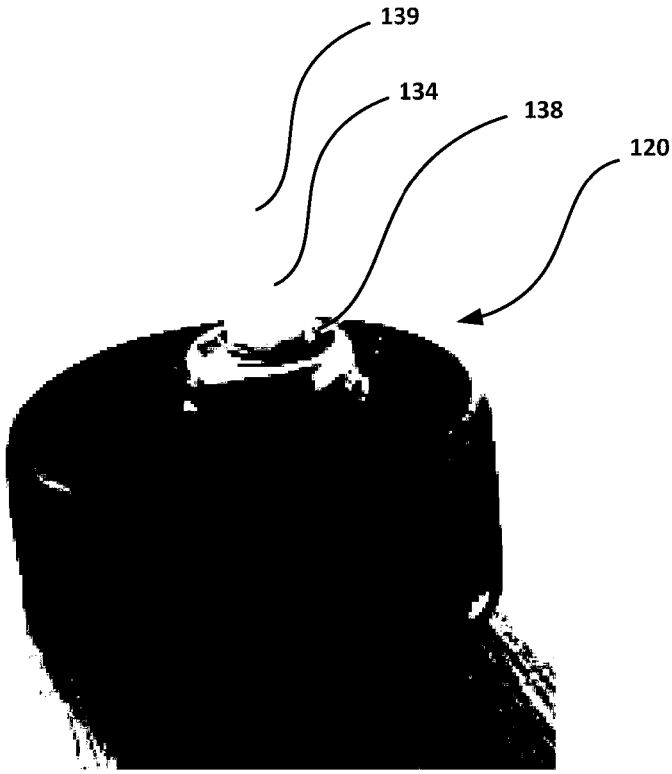

FIGURE 2A

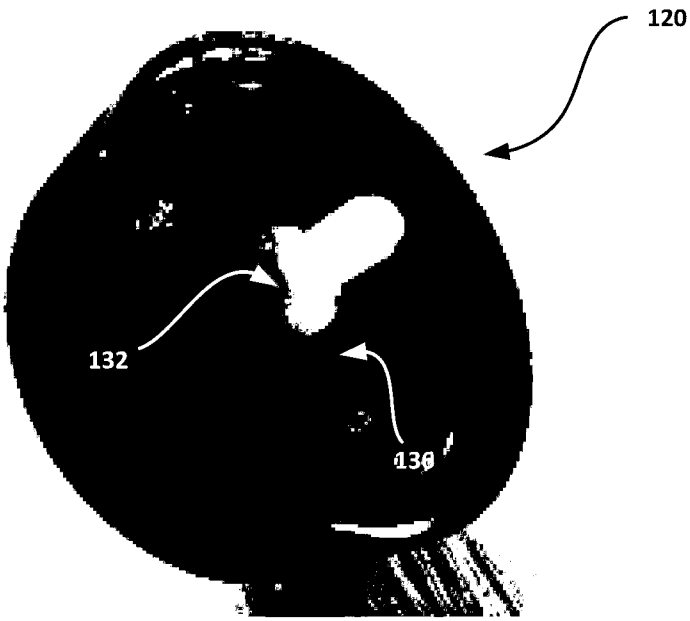

FIGURE 2B

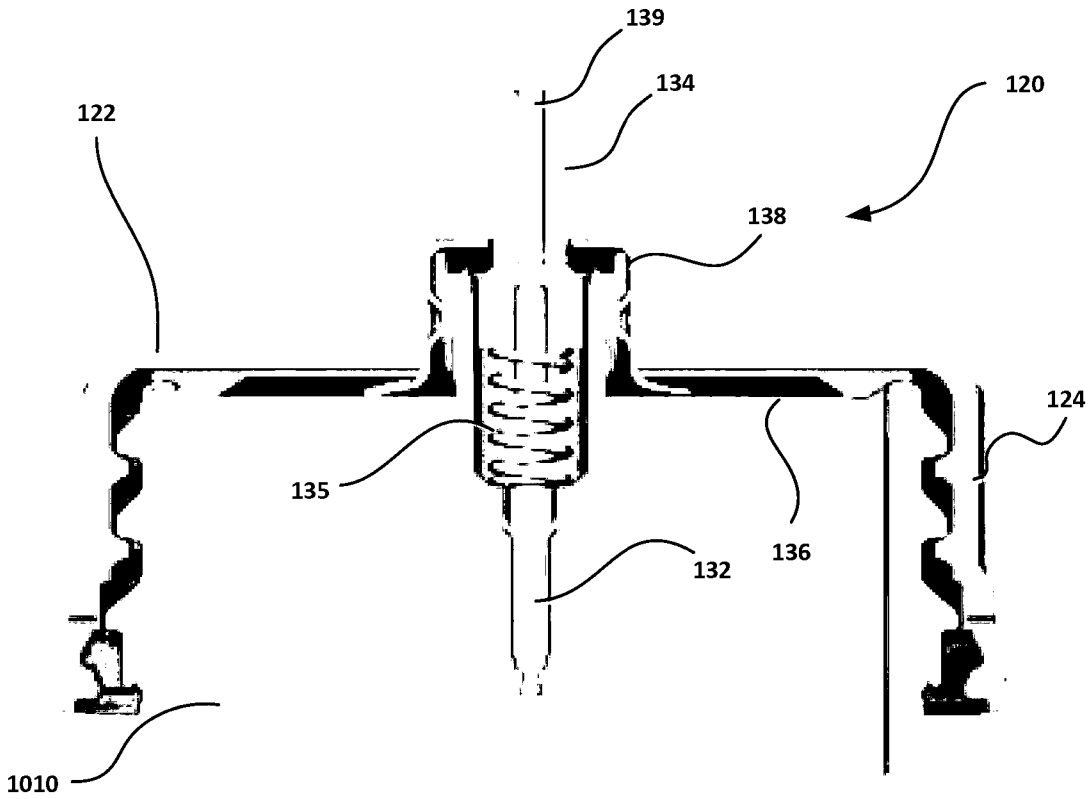

FIGURE 2C

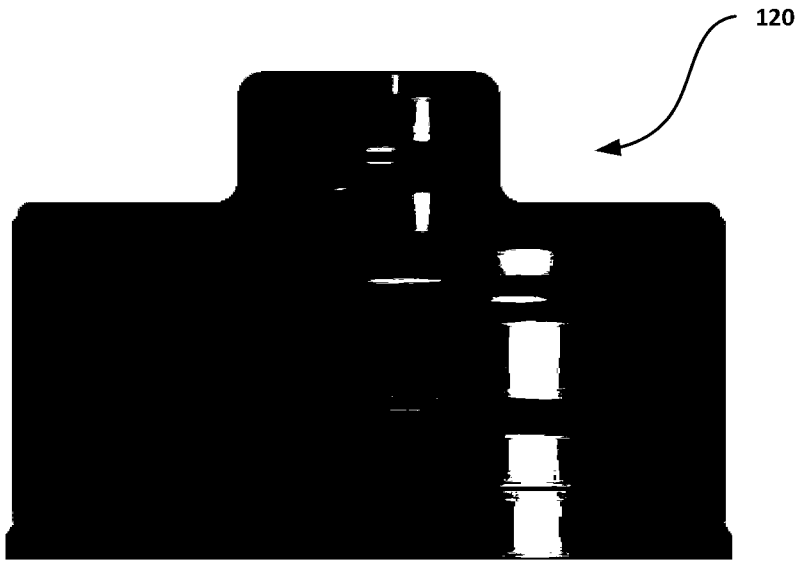

FIGURE 2D

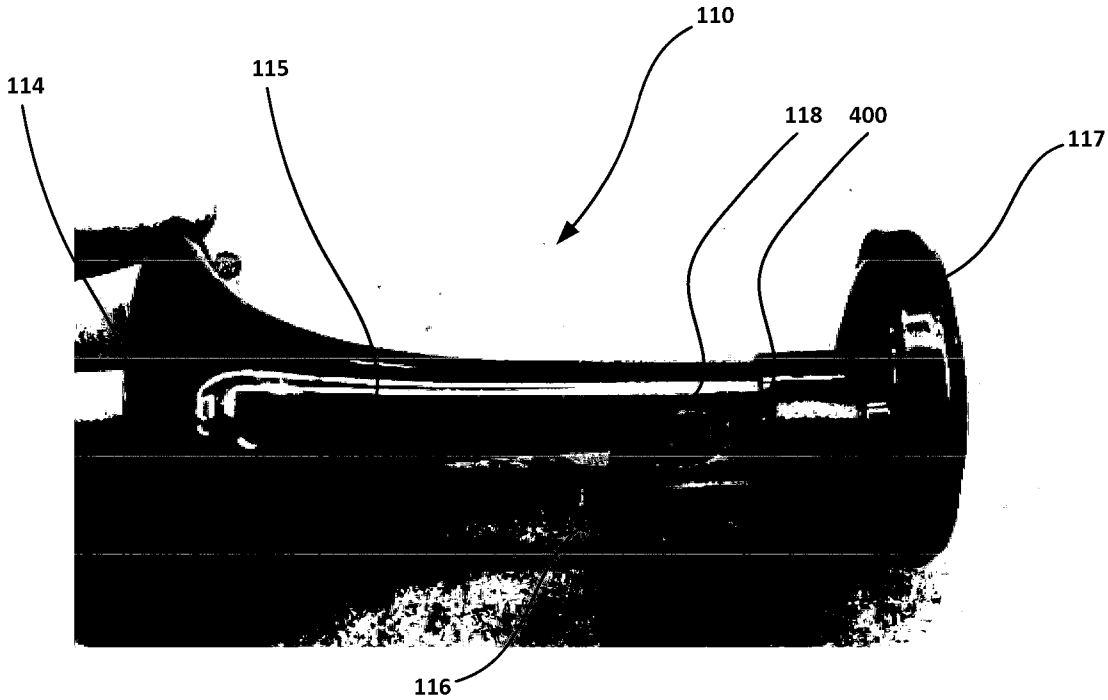

FIGURE 3A

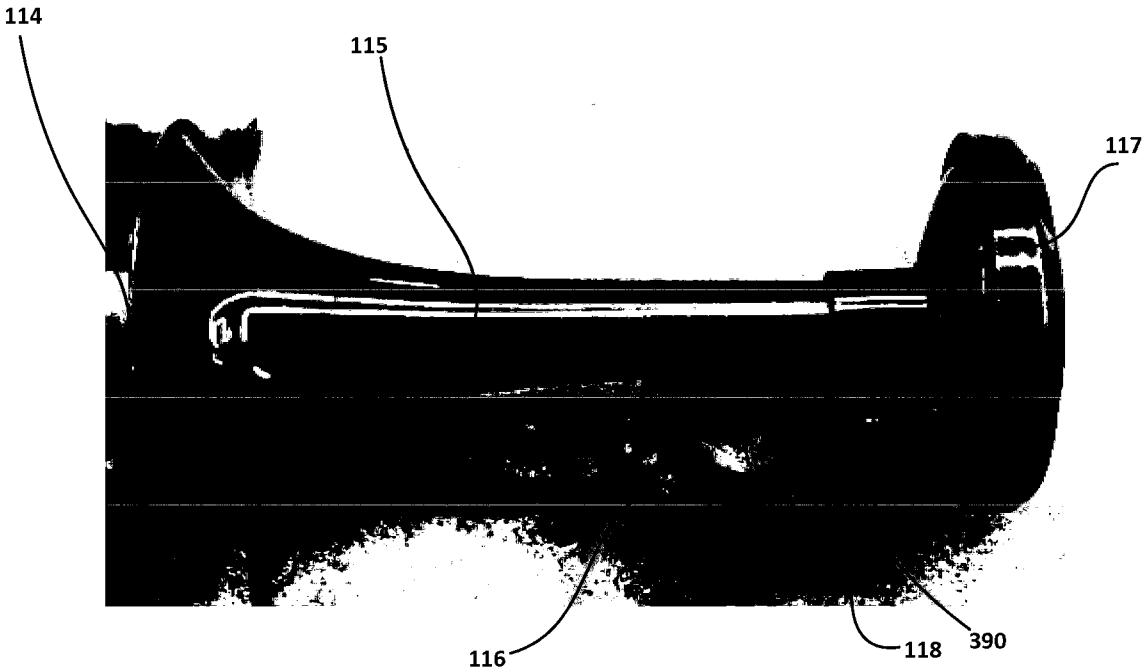

FIGURE 3B

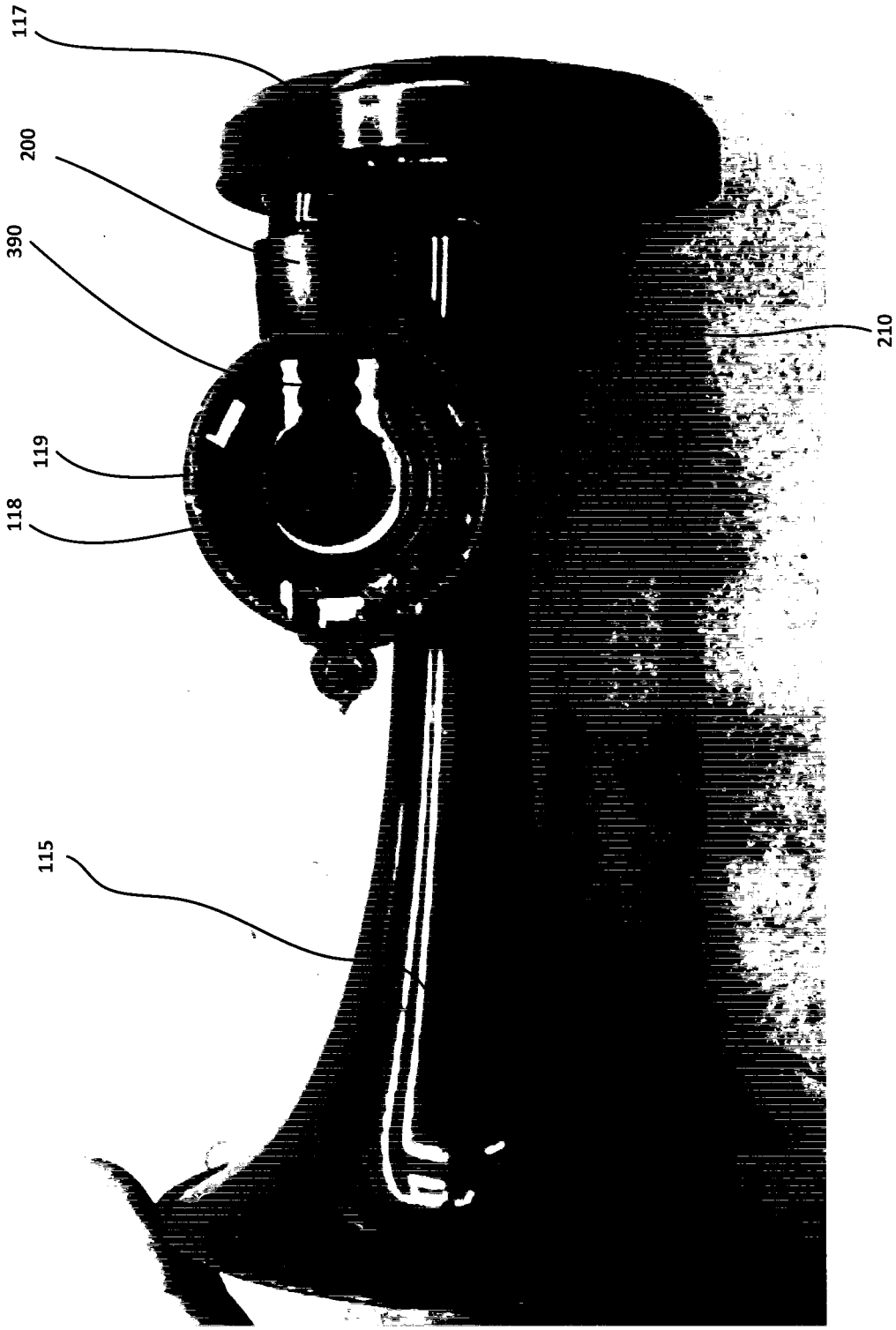

FIGURE 3C

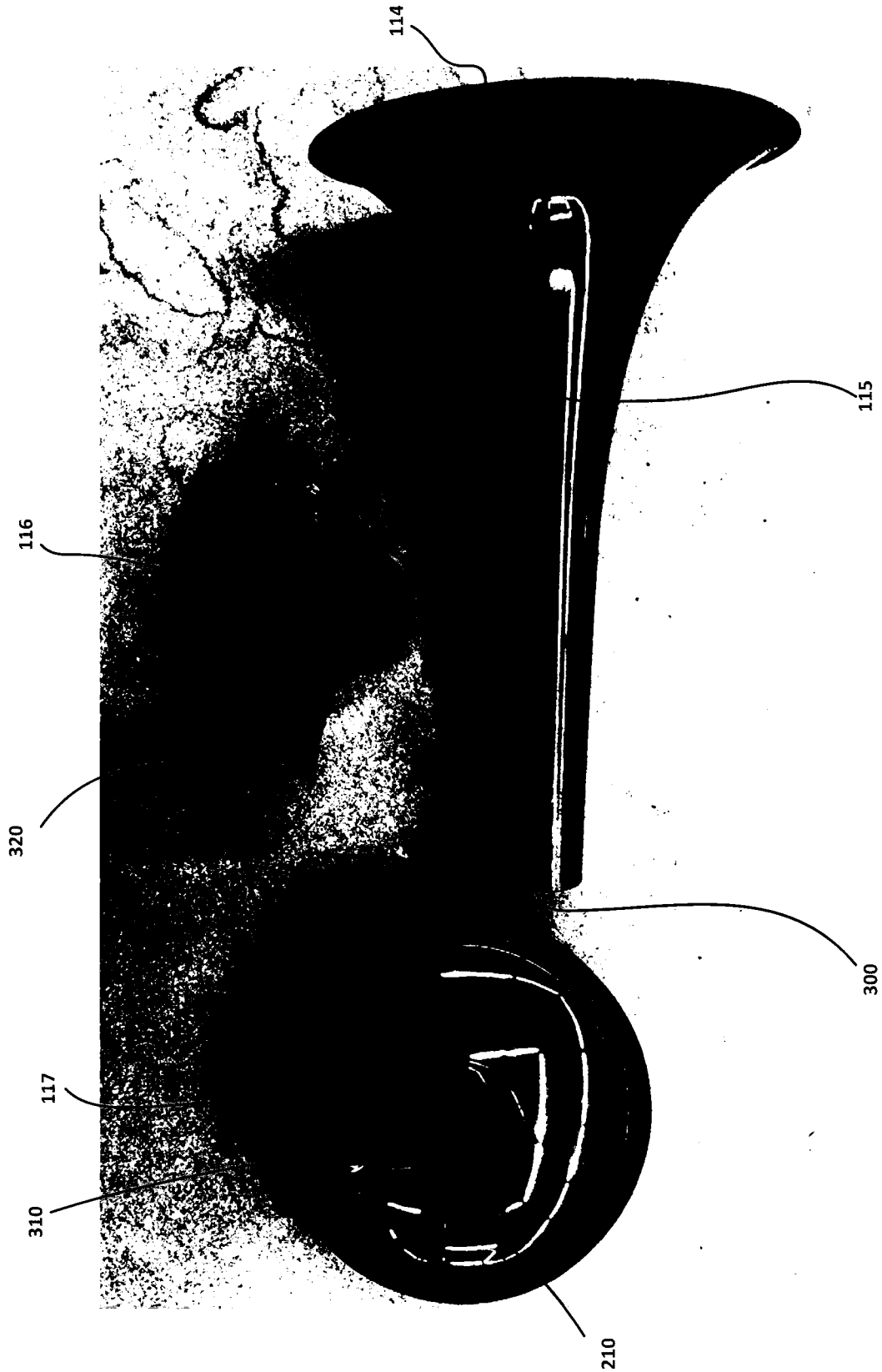

FIGURE 3D

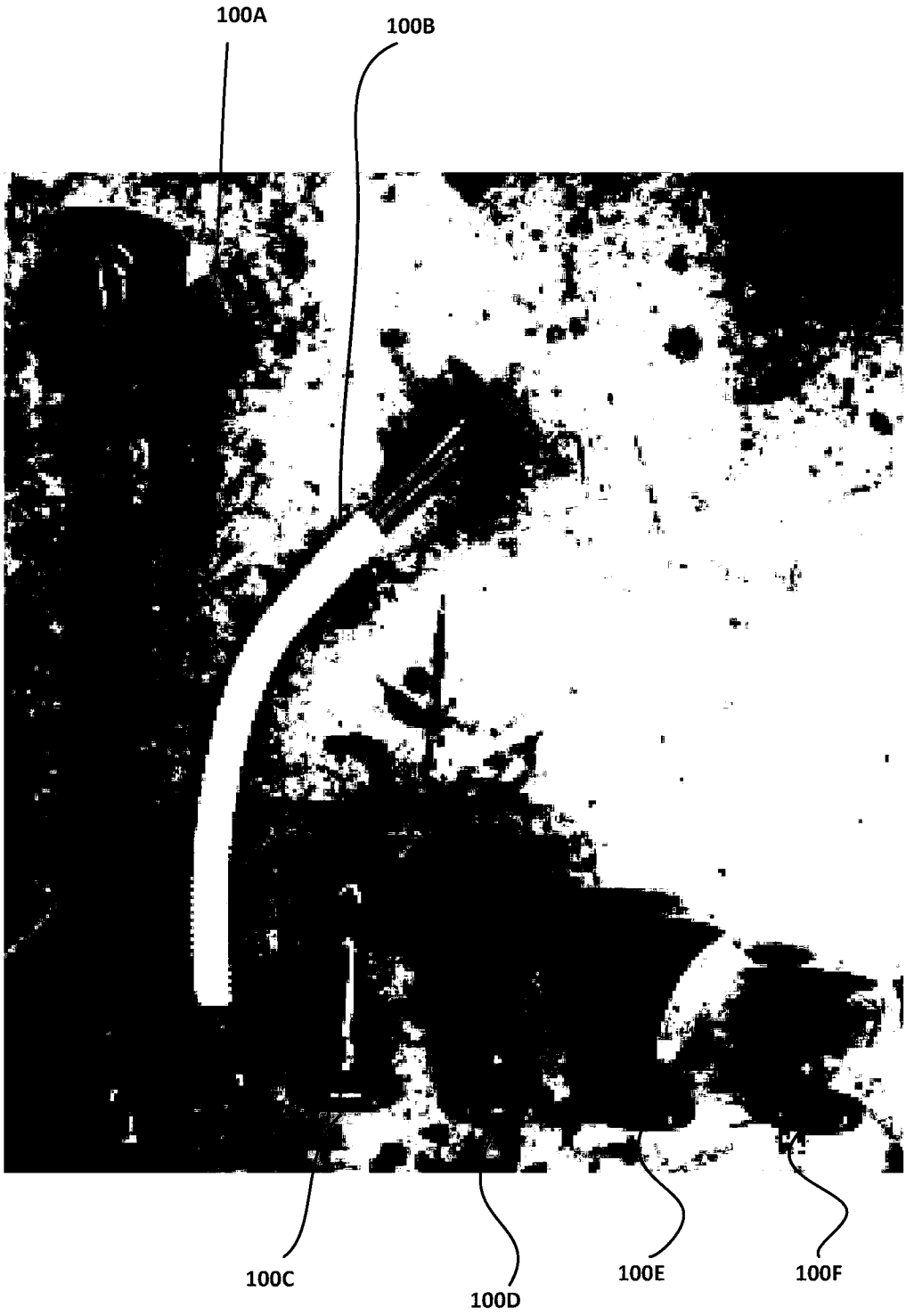

FIGURE 4

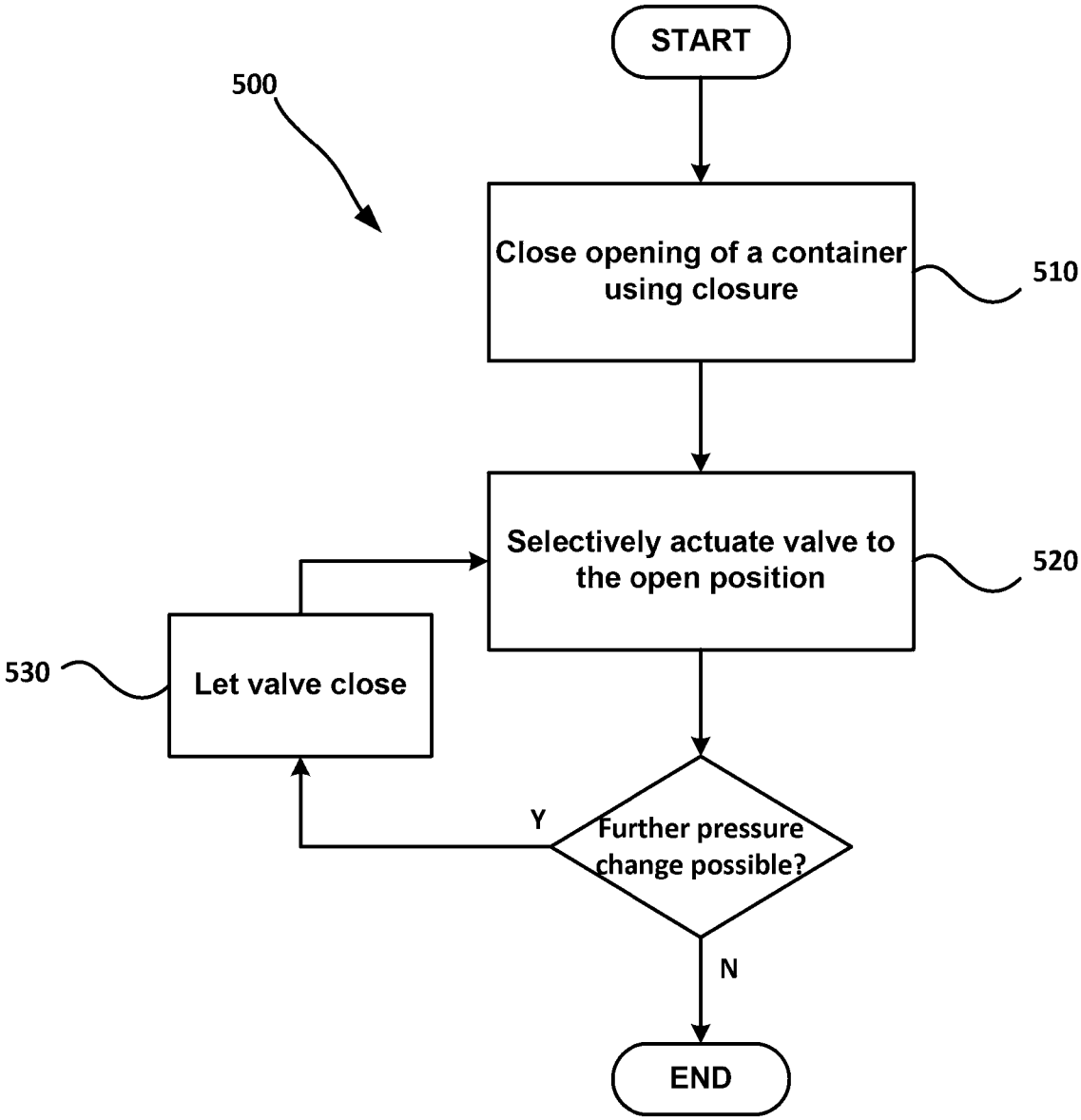
START
500
Close opening of a container using closure
510
Selectively actuate valve to the open position
520
530
Let valve close
Y
Further pressure change possible?
N
END

FIGURE 5

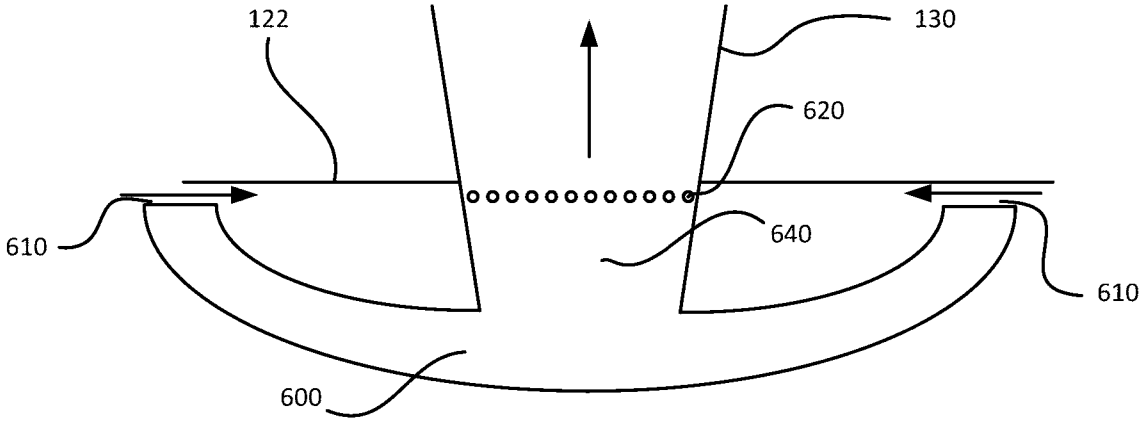

FIGURE 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2017/050447

A. CLASSIFICATION OF SUBJECT MATTER

B65D 51/16 (2006.01) A63H 5/00 (2006.01) G10F 1/12 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PATENW - IPC/CPC marks: B65D 51/00, G10K 5/00, A63H 5/00; keywords include: carbonated, noisemaker, horn, valve and similar keywords.

Google, Google Patents, Google Scholar, and ESpaceNet: Similar terms as listed above.

Applicant/Inventor name searches were performed in Google and ESpaceNet websites, and internal databases provided by IP Australia.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

[X] Further documents are listed in the continuation of Box C [X] See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 May 2017	30 May 2017

Name and mailing address of the ISA/AU	**Authorised officer**
AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustralia.gov.au	Craig Cooper AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. 0262832705

INTERNATIONAL SEARCH REPORT C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		International application No. **PCT/AU2017/050447**
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3670689 A (PAPPAS) 20 June 1972 Figure 2, Col. 1 Ln. 49-50, Col. 1 Ln. 63-64, Col. 1 Ln. 68-71, Col. 2 Ln. 9-19, Col. 3 Ln. 10-17	1-21
A	US 6299006 B1 (SAMONEK) 09 October 2001 Abstract, Figures 4 and 5	
A	US 4892209 A (DORFMAN et al.) 09 January 1990 Abstract, Figures 3 and 5	
A	US 1071431 A (GEORGE WILLIAM KELLER) 26 August 1913 Pg. 2 Col. 1 Ln. 39-46	

INTERNATIONAL SEARCH REPORT Information on patent family members	International application No. **PCT/AU2017/050447**

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document/s Cited in Search Report		**Patent Family Member/s**	
Publication Number	**Publication Date**	**Publication Number**	**Publication Date**
US 3670689 A	20 June 1972	US 3670689 A	20 Jun 1972
		CA 926162 A	15 May 1973
		CA 926163 A	15 May 1973
		CA 926164 A	15 May 1973
		GB 1316178 A	09 May 1973
		GB 1316179 A	09 May 1973
		GB 1316180 A	09 May 1973
US 6299006 B1	09 October 2001	US 6299006 B1	09 Oct 2001
US 4892209 A	09 January 1990	US 4892209 A	09 Jan 1990
		AR 245421 A1	31 Jan 1994
		BR 8804164 A	14 Mar 1989
		EP 0304014 A2	22 Feb 1989
		MX 171980 B	26 Nov 1993
		US 4767016 A	30 Aug 1988
US 1071431 A	26 August 1913	US 1071431 A	26 Aug 1913

End of Annex

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.