(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 918 314 A2

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
16.09.2015 Bulletin 2015/38

(21) Application number: **14751423.6**

(22) Date of filing: **13.02.2014**

(51) Int Cl.:
A63B 41/12 *(2006.01)* ***A63H 27/10*** *(2006.01)*
F04B 33/00 *(2006.01)* ***G07F 11/00*** *(2006.01)*

(86) International application number:
PCT/MX2014/000045

(87) International publication number:
WO 2014/126451 (21.08.2014 Gazette 2014/34)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **13.02.2013 MX PA13000070 U**

(71) Applicant: **Cigarsolo, S.a. De Cv.**
Zapopan Jalisco (MX)

(72) Inventor: **MEDINA ANGUIANO, Luís**
C.P. 45010 Zapopan Jalisco (MX)

(74) Representative: **Carlos Hernando, Borja**
Garrigues IP, S.L.P.
Hermosilla, 3
28001 Madrid (ES)

(54) **HYDRAULIC DEVICE FOR INFLATING INFLATABLE OBJECTS AND UNITS COMPRISING SAME**

(57) The invention describes a hydraulic device for inflating inflatable objects, formed by a folding container that has a folding half and a rigid half, an inserted threaded neck; a perforated cap and internally threaded closes the perforation of the neck; a first conduit is connected into the perforation of the inserted neck; a check valve is provided at the other end of the first conduit, such valve is compose of a body that has inside 3 ducts; a second conduit for filling with air the inflatable object, is connected to a check valve, by means of one of its ends; an inflating valve is attached to the other end of the second conduit; and a liquid is housed inside the holding container.

Also describes machines, modules, devices, etc., which comprise said hydraulic device.

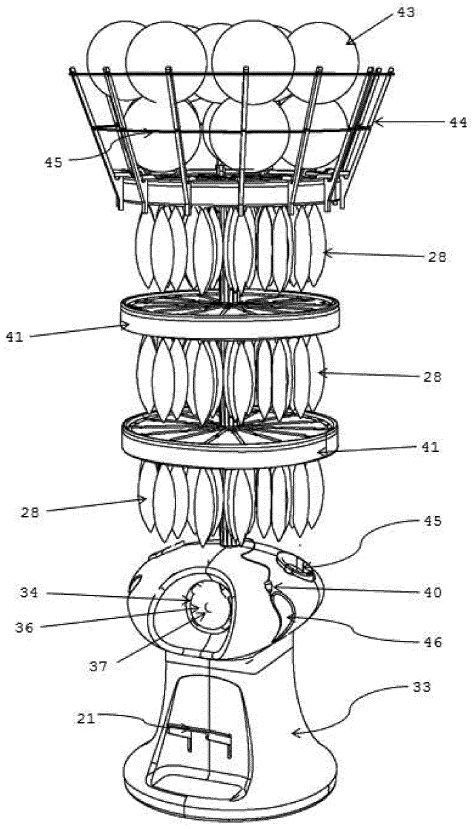

FIG. 11

EP 2 918 314 A2

Description

TECHNICAL FIELD OF INVENTION

[0001] The present invention is related to the mechanics and hydraulics; since an hydraulic device is proposed to inflate inflatable objects; and units comprise the same, for example, a modular machine to sell, display, inflate and deflate inflatable objects, such as balls, balloons, "livesavers", among others.

INVENTION BACKGROUND

[0002] The commercialization of inflatable toys has been widely accepted, due to this, technology to sell, display and inflate them has been developed.

[0003] In the registration application of utility patent MX/u/2007/00215 it is described a device with an inflating mechanism for a vending machine of deflated balls that includes: a lower base; a front vertical wall which projects upward from the base; an external pedal, which extends inwardly through the vertical wall; at least one pneumatic piston connected to the pedal and which has an air outlet; a first hose connected to the air outlet of, at least, one piston; a "T"-connector to the first hose to divide the air flow by two outlets; a second hose coupled to a connector's outlet extending to exit through a front hole of the vertical wall; a valve for inflating coupled to the second hose; a third hose coupled to the other air outlet of the connector ending in a relief valve; a cam connected to the relief valve to release excess air; an external handles which project toward the front of the vertical wall.

[0004] In turn, the patent application, US20100190984, describes a base with inflating mechanism for the vending machine of deflated balls, compose of an external pedal connected to two pneumatic pistons attached at its upper part to a manometer, which are attached to the hose connected to a "T"-connection, that at its lower part includes a pulley wheel to which two coupled springs attach the internal walls of the vending machine, which allow the hose with the valve, located outside of the machine, to inject air to the ball. The "T"-connection is attached to the hose that in its end portion covers a relief valve placed outside of the machine by a lever that releases the air flow injected to the ball.

[0005] The disadvantage with this type of technologies is that inflatable objects may burst if not careful with the amount of air applied.

[0006] In those devices having relief valves, these only release excess air and it is possible to continue applying air, which generates a device wear and also for the user; also, such relief valves do not balance the air pressure between the inflated object and the device used to inflate it.

[0007] On the other hand, the machines have not a module displaying the inflated and deflated toys at the same time, the closest knowledge to the present invention is described in the document MX/u/2007/00215 related to deflated balls that have been encapsulated in a plastic sphere to then be provided to the customer by conventional means of the vending machine.

DETAILED INVENTION DESCRIPTION

[0008] Characteristic details of the present invention are clearly specified in the following description, figures and examples, attached to the present, which are merely one of the many modalities to develop the invention, so that, these should not be considered as a limitation.

Short description of figures:

[0009]

Figure 1 is a conventional perspective view of the device to inflate inflatable objects, of the present invention.
Figure 2 is an exploded view of a check valve that is part of the device of the present invention.
Figure 3 is an isometric view of the housing of the device in question.
Figure 4 is a side view of the housing of said device of this invention.
Figure 5 is a front view of the housing.
Figure 6 is a perspective view of the device integrated to the housing.
Figure 7 is an exploded isometric view of the device integrated to the housing, where it is observed the addition of some fittings.
Figure 8 is an isometric view of the figure 7, but with the fittings integrated.
Figure 9 is a front view of a receptor piece of the object to be inflated.
Figure 10 is a side view of the receptor piece of the object to be inflated.
Figure 11 is a conventional perspective view of a balls vending machine, that includes the device of the present invention.
Figure 12 is a side view of the machine illustrated in figure 11.
Figure 13 is an isometric view of a machine dispensing encapsulated balls and that includes the device in question.
Figure 14 is a side view of the machine of the figure 13.
Figure 15 is an isometric view of the method of use of the device of the present invention.
Figure 16 is a side view of the method of the above mentioned figure.
Figure 17 is a perspective view of a further method of use of the device.
Figure 18 is a front view of the method of the above mentioned figure.
Figure 19 is side view of the method of the figure 17.

[0010] The invention related firstly to a hydraulic device

for filling air to inflatable objects. Said device is composed of: a folding container, which has a half folding (1) bellows type, and its other half (2) is rigid, that is to say this is not retractable; a liquid (not shown) is housed inside the container and has an inserted external threaded neck, at the top of the rigid portion (2)of the folding container, by this inserted threaded neck enters and exits fluids, reason for which said neck is closed by a perforated cap and internally threaded (3). A first duct (4) is connected in the inserted neck perforation of the folding container; and the other extreme of the duct has a "check valve".

[0011] The "check" valve is composed of a body that inside has three ducts, where: in the first duct (6) is connected the end of the first conduit (4), in a second duct (7) it is allowed the air inlet from outside to feed air to the flexible container and object to be inflated, so that this conduit is adapted to contain a lightweight cap (8) that rises with the air coming from outside, and the air inlet of the second conduit is closed (7)with the air coming from the container and/or inflatable object. A perforated cap (9) closes the entrance of the second conduit (7).

[0012] The third duct (10) of the "check" valve has a narrowest diameter in comparison with the second duct's diameter (7), an internal threaded wall where is housed a marble (11), and a inserted threaded cap (12) closes this third duct (10). In the threaded cap(12) is connected a second conduit (13) which is going to fill with air the inflatable object, so that at its other end has an inflating valve (14).

[0013] A stop-cock (15) is provided in the first conduit (4), to prevent the liquid (not shown) leaks from the container, when transporting or maintaining.

[0014] The liquid introduced in the container may be the one that moves air when it is compressed, for example, water, oils, etc., so that it is clear that the liquid is applied in an enough amount that allows enough air to inflate an inflatable object; where it is preferably that the liquid occupies only the retractable part (1) of the container.

[0015] The folding part (1) is extensible and/or retractile and because inside there is liquid, when this contracts or extends, expel and introduces a gaseous fluid, such as air, inside the container.

[0016] How to operate the device in question is very simple, since it is enough to contract under pressure the container in order the air moves by the first and second conduit (4 and 13) to arrive to the inflatable object. By releasing or stopping to apply pressure, the container returns to its normal shape, that is to say this expands and this makes possible that this pulls air from exterior which enters by the second conduit (7), reloading said container of air again. The action of applying pressure is repeated the necessary times, preferably, until the inflatable object is full of air.

[0017] To facilitate the device operation of the present invention, there are several mechanisms, from the simplest and already known to those developed to be adapted to said device.

[0018] In this case it is propose a housing adapted to contain and operate said device; which is composed of one horizontal platform (16) in the lower end, where it is placed vertically the folding container (see figure 6); such platform has a pair of shafts (17) on its sides, which pass through a vertical perforation (18) that are on the side of the housing, and are introduced and displaced along slots (19) which are kidney-shaped, and are located in one of the ends of the levers (20). In order these levers may be operated, these will have a pedal in their other extreme (21), the pedal being projected toward the front of the housing.

[0019] A stop piece (22) is fixed to the top of the housing, but leaving enough space to place the conduits (4, 13) of the container, and has a central perforation to make possible the threaded neck together with its cap (3) protrudes from there. In this way, the folding container is trapped between the platform (16) and the top piece (22), in order the platform (16) is raised with the levers (20), the folding portion (1) is contracted and the rigid portion (2) bumps into said stop piece (22), so that the air contained in the rigid portion is displaced towards the conduits (4 and 13).

[0020] A door (23) is vertically provided at the rear side of the housing, to close it, said gate has a window (not shown), located in such a way that allow to verify the water level of the container. The housing also has perforations (24) located in such a manner that allow to install the conduits (4 and 13) of the device; and support means (25) where to place the "check" valve.

[0021] Optionally it is provided externally a reinforcement element as a belt (26), in the rigid portion (2) from the liquid container, to avoid deforming and not lose pressure at the moment of contracting the container to expel the air.

[0022] Such housing is also provided with elements (27) strategically placed to fix a base or bracket.

[0023] The inflating valve (14) to inflate the inflatable object (28) comes up from the housing by a perforation (29), which is placed preferably at the front upper part of the housing.

[0024] The housing, in addition to contain and hold the folding device, serves as base to hold firmly other external elements. For example, at the upper part it is placed a base (30) which is adapted to hold a handle (31) or shaft (32).

[0025] The combination of the hydraulic device and the housing may be covered by a second housing (33) which may serve, mainly for an aesthetic view. In this way it is possible to say that you have a machine to inflate inflatable objects, by means of a hydraulic device. Reason for which said second housing may be have any shape, but this should be configured to be compatible with external parts of the internal housing. For example, this should have exits from which the levers (20) come up in order the pedal (22) is externally at the front part of the machine; in the part where the object is inflated, that is to say where the inflating valve is placed (14), it should have the shape

of said object in order a perfect air filling is reached.

[0026] To condition the inflating area, a concave part is placed vertically (34), which has a central perforation (38) from where the inflating valve comes up (14); as well as this has a protuberances (35) which serve to eject the inflatable object (28) when is already full of air.

[0027] Optionally, a kind of small screen (36) is provided to cover the inflating area to protect the inflating valve (14), so that such small screen (36) may be a flexible piece, either plastic or fabric, etc., which it is conditioned with a small cavity (37) by the side this contacts the inflating needle valve (14), so that the tip of said needle introduces in the cavity (37) whenever the machine is in standby. So that the cavity (37) is located in the exact position coinciding with the needle position of said valve (14). The way of attaching the small screen (36) is that the concave piece (34) has a slot (39) at its upper side, where the small screen is attached and hanged (36).

[0028] Optionally, at the upper side of the external housing (33), may be provided cavities, where a post or shaft is placed (32), containers (45) to collect garbage, such as labels, bags, etc.

[0029] Also this may be provided with cavities or spaces (46) that serve for users rest on the machine when they are inflating their ball instead of handles (31).

[0030] As an inflatable object (28),in this invention we should to understand all those object elaborated from a material that have enough characteristics to receive air pressurized inside. In an enunciative manner but not limited, the following objects which may be inflated with the present invention are detailed: inflatable toys, balls, balloons, spheres, bullets, pellets, spherical, footballs, "livesavers", air chambers of tires of any vehicle, inflatable swimming pools, inflatable bounce houses, just for mentioning some examples.

[0031] Optionally, you may add to the machine for inflating inflatable objects (28) a deflating needle (40), which may be attached to said machine by any fastening mean, such as rope. With this needle, the user may have the option to deflate the ball in order to facilitate the transportation.

[0032] The machine for filling with air inflatable objects, of the present invention you may make a series of adaptations to give it different purposes.

[0033] For example, this may be become a module to display and dispense inflated and deflated balls, for this, a post or vertical shaft is fixed vertically to the central top perforation of the external housing (32), in which at least one rotating tray is inserted and fixed, horizontally and concentrically (41).

[0034] The rotating tray (41) has a central perforation, where a hollow stem is projected downward (42), in such a way that the vertical post (32) passes through said stem and comes up by the central perforation of the tray (41), the stem (42) serves to trays may be separated and held up together by themselves; but it is possible to use another mean to hold the trays to the desired distance (41). It is important to say that the stem should has such diameter, that allows the tray to rotate (41) on its own axis. The rotating tray (41) has at the bottom a series of elongated hooks(not shown) projected radially and slightly bended towards the tray perimeter (41), which are used to hang inflatable objects (32), as in this case, deflated balls. In this way, the user may chose a deflated ball (28), just turning the tray (41).

[0035] It is important to say that rotating trays (41) may have circular, oval and any polygon shape just to mention some triangles, squares, rectangles, pentagons, hexagons, etc., and the combination between said shapes.

[0036] The present machine also may include a little basket where inflated balls are shown (43). Said basket is compose of, in this case, a circular tray (41) as that above described, to which is fixed on the perimeter and vertically a series of posts (44) on its upper face; and a ropes (45)are placed circularly and horizontally, between the posts (44), in such a way that the basket is formed. It should be noted that the location of the basket also is in the vertical post (32) and it is suggested that it is placed in the upper portion. See figures 11 and 12.

[0037] Other variation of the present machine is that in the upper part it is possible to mount and fix a dispenser module of encapsulated deflated balls, as shown in Figures 13 and 14; where also said module may include a conventional "slot machine" for the purchase and delivery of the ball.

[0038] Other variation of the present machine is that this may be used as toy for fun, an example of that is a giant spinning top (Figures 15 and 16), where a rotating shaft on its own axis (32) is inserted in the upper cavity of the external housing to support the body of spinning top(47).

[0039] Another variant is that the machine, of the present invention includes in its own body a slot machine (48), for which, the upper part of the housing is extended to a neck (49) to create a portion where said mechanism of "slot machine" is placed (48). The display case of the encapsulated balls may be of the desired shape, that is to say, spherical (50), square, etc.

[0040] As above mentioned, these examples just illustrate the preferred modalities for the development the present invention, so that all those variants that may be carried out the same are comprised in the scope of the protection of the present invention.

[0041] From the different advantages offered by the device for filling with air inflatable objects, and the vending machine and display case of the present invention, these are some of them in an enunciative manner:

- ✓ Due to the hydraulic mechanism of the device in question, this may be activated by a child and individuals with disabilities, since is softer than a pneumatic system, because this requires lower force to compress an air-liquid system.
- ✓ Less wear of the device
- ✓ It is not required a compressor, either electric or mechanical.

✓ The inflatable object does not break, as in the conventional objects.
✓ Easy maintenance for the device.
✓ This is composed of a small number of parts.
✓ Easy to assemble and disassemble
✓ It requires less space for transportation.
✓ It occupies small spaces, for example, in an area of 60 x 60 cm, it is possible to display up to 196 deflated balls.
✓ The customer may decide to buy the toy inflated or deflated.

Claims

1. An hydraulic device for filling air to inflatable objects, that is compose of:

i) One folding container, which has a folding half (1) bellows type, and the other half (2) is rigid; and has a inserted externally threaded neck externally at the upper part of the rigid part (2);
ii) A perforated cap and internally threaded (3) that closes the neck perforation;
iii) A first conduit (4) is connected to the inserted neck;
iv) A "check" valve is provided in the other end of the first conduit (4), said valve is composed of a body that has internally three ducts;
v) A second conduit (13) for filling with air the inflatable object is connected to the "check" valve, by means of one of its tips;
vi) A inflating valve (14) is connected to the other tip of the second conduit (13); and
vii) A liquid housed in the interior of the folding container.
viii) The device of the above mentioned claim, that includes also a stop-cock (15) in the first conduit (4), to prevent the liquid leaks from the container when transported or give maintenance.

2. The device of the foregoing claims, where "check" valve includes:

i) A first duct (6) is connected to the end of the firs conduit (4);
ii) A second duct (7) that allows the entrance of air from outside to feed air to the folding container and object to be inflated, so that this conduit is adapted to contain a lightweight cap (8)which is raised due to the air coming from outside, and closes the entrance to the second conduit (7) with the air coming from the container and/or inflatable object; and a perforated cap (9) closes the entrance to the second duct (7); and
iii) A third duct (10) that has a narrowest diameter in comparison with the second duct diameter (7), an internal threaded wall where is housed a marble (11), and an externally threaded inserted cap (12) closes this third duct (10).

3. The device in accordance with any of the above mentioned claims, where the liquid introduced in the container is that that displaces air when compressed.

4. The device pursuant to the above mentioned claim, where liquid is applied in an enough amount to allow to displace sufficient air to inflate an inflatable object.

5. The device of the aforesaid claim, where it is preferably that said liquid occupies only the retractile portion (1) of the container).

6. The device according to claim 4 to 6, where liquid is water and and/or oils.

7. A machine to inflate inflatable objects, includes:

i) An hydraulic device to inflate inflatable objects in accordance with the device detailed in any of the above mentioned claims; and
ii) A housing adapted to contain and activate said device.

8. The machine of the above mentioned claim, that includes:

i) A horizontal platform (16) in the lower end, where the folding container is vertically placed, said platform has a pair of shafts (17) on its flanks, which pass through vertical perforations (18) that are located at the flanks of the housing; and are introduced and displaced along, which are located in one of the ends;
ii) A pair of levers (20) that in one of its tips has a kidney-shaped slots (19), that receive the shafts (17);
iii) A pedal (21) projected towards the front part of the housing that activates a pair of levers (20)
iv) A stop piece (22)is fixed towards the upper part of the housing, but leaving enough space where adapting the conduits (4, 13) of the container, and has a central perforation to allow the threaded neck with is cap protrude from there;
v) A gate (23) is provided vertically in the rear part of the housing to close it, where said gate has a window located in such a way that allow to verify the water level of the container.
vi) Perforations (24)located in such a manner that allow the installations of conduits (4 and 13) of the device;
vii) Support means (25)where to support the "check" valve; and
viii) A perforation (29), which it is placed, preferably in the upper front part of the housing in

order the inflating valve comes out (14)

9. The machine of claims 8 and 9, that includes also, a reinforcement element, with a belt (26) in the rigid half (2)of the container of liquid, to prevent deformity and the pressure is not lost at the moment of contracting the container to eject the air.

10. The machine in accordance with any of the claims 8 to 10, that includes also, elements (27) strategically placed to fix it in a bracket or base.

11. The machine pursuant to claims 8 to 11, that includes optionally, a base (30)fixed in the upper part of the housing.

12. The machine according to claims 8 to 12, that includes optionally a handles (31) placed in the base (30).

13. The machine of claims 8 to 23 that contains also, an external housing (33)that internally includes the device together with its housing; where said external housing has exits for which the levers (20) protrude in order the pedal (22) is externally in the front part of the machine; and in the part where object is inflated, that is to say where the inflating valve is placed (14), it should have the shape of said object when inflated, in order there is a perfect filling of air.

14. The machine of the above mentioned claim, that includes vertically a concave part (34)in the inflating area, said piece (34) has a protuberances (35) which serve to expel the inflatable object (28)once full of air.

15. The machine according to claims 14 and 15, that optionally included, a kind of small screen (36)to cover the inflating area, in order to protect the inflating valve (14), so that said small screen (36) may be a flexible piece, either plastic, fabric or similar, to which it is conditioned a small hollow (37) by the side contacting the needle of the inflating valve (14), so the tip of said needle introduces in the hollow (37), whenever the machine is in standby. Reason for which that hollow (37) is located in the exact location to coincide with the needle position of said valve (14).

16. The machine pursuant to the foregoing claim, where the small screen (36) is fixed in a slot (39)that has a concave piece (34) at its upper part.

17. The machine in accordance with claims 14 to 17, where the external housing (33) has at is upper part cavities where it is place a post or shaft (32), containers (45) to collect garbage.

18. The machine of claims 14 to 18, that also includes, cavities or spaces (46) that serve for users rest on the machine when they are inflating their ball, instead of handles (31).

19. The machine according to claims 8 to 19, where the inflatable object (28) is any object made of a material that has enough characteristics to receive pressurized air internally.

20. The machine of the foresaid claim, where the inflatable object is selected from a group of: balls, balloons, spheres, bullets, pellets, spherical, footballs, "liver savers", air chambers of tires of any vehicle, inflatable swimming pools and/or "inflatable bounce houses".

21. The machine in accordance with claims 8 to 21 that optionally includes a deflating needle (40), which is fixed by means of any fastening mean, such a rope.

22. A module to display and sell inflated and deflated balls, that includes:

i) A machine to inflate inflatable objects, such as described in any of the claims from 8 to 22;
ii) A post or vertical shaft (32) fixed vertically in the upper central perforation of the external housing;
iii) At least one rotating tray (41) is inserted and fixed horizontal and concentrically, in the post (32).

23. The module according to the aforementioned claim, where the rotating tray (41) has a central perforation, where a hollow stem (42)is projected downward, in such a way that the vertical post (32) passes through said stem and comes out by the central perforation of the tray (41), the stem (42) serves to trays may be separated and held up together by themselves; the rotating tray (41) has at the bottom a series of hooks projected radially and slightly bended toward the tray perimeter (41), which are used to hand inflatable objects (32, as in this case, deflated balls.

24. The module of claims 23 and 24 that includes additionally a basket where inflated balls are displayed (43), which is composed of one rotating tray (41), which is on the perimeter and vertically fixed and a series of posts (44) over its upper face; and some ropes (45) are placed, circular and horizontally, between the posts (44) in such a manner that the basket is formed.

25. An encapsulated and deflated balls vending machine, that includes:

i) A machine for filling with air inflatable objects, according to any of the claims from 8 to 22; and
ii) A dispenser module of deflated and encapsu-

lated balls fixed and mounted in the upper part of the machine for inflating inflatable objects; additionally said module includes a conventional "slot machine" mechanism, for the purchase and delivery of the ball.

26. The machine of claims 8 to 22, that also includes, a slot machine mechanism (48) integrated, for which the upper part of the housing is extended in a neck (49) to create a portion where said slot machine mechanism is placed (48).

27. A dispenser module of deflated and encapsulated balls that includes:

i) One machine as detailed in the above mentioned claim; and
ii) A spherical display case of encapsulated balls (50).

28. A toy for fun that includes:

29. i) A machine for filling with air inflatable objects in accordance with any of the claims from 8 to 22 and 27;
ii) A rotating shaft or not (32), on its own axis, is inserted in the upper cavity of the external housing (33); and

30. The toy of the above mentioned claim, where a toy is a spinning top, carousel and/or wheel.

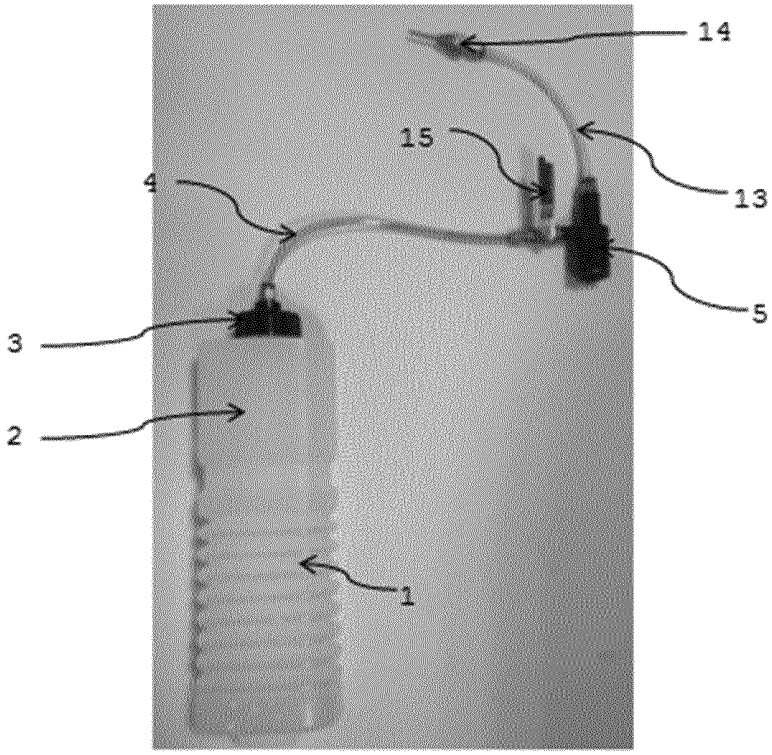

FIG.1

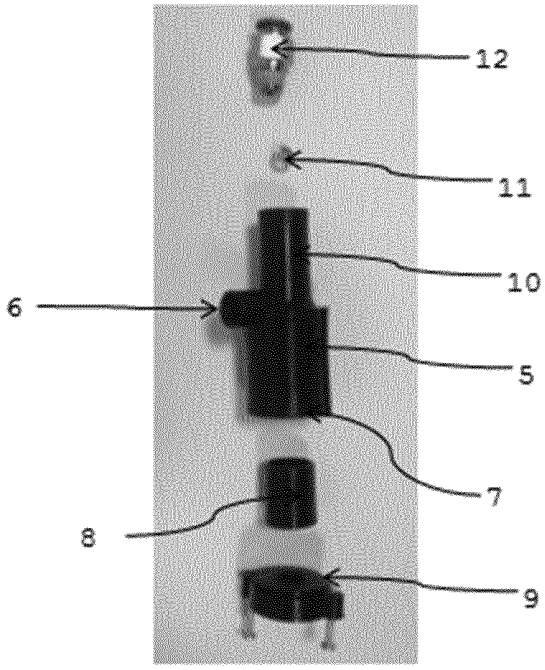

FIG. 2

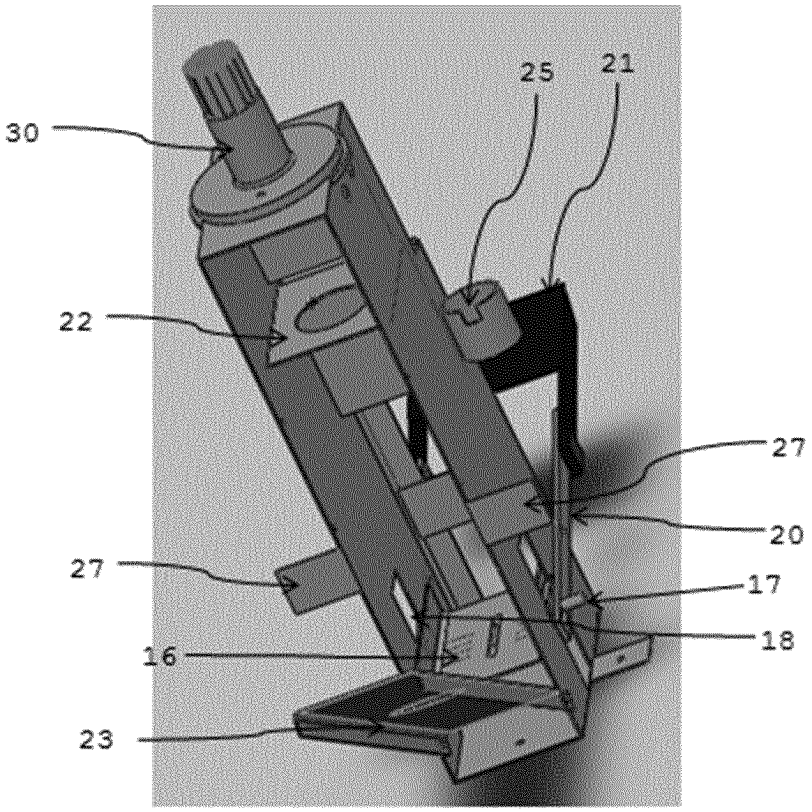

FIG. 3

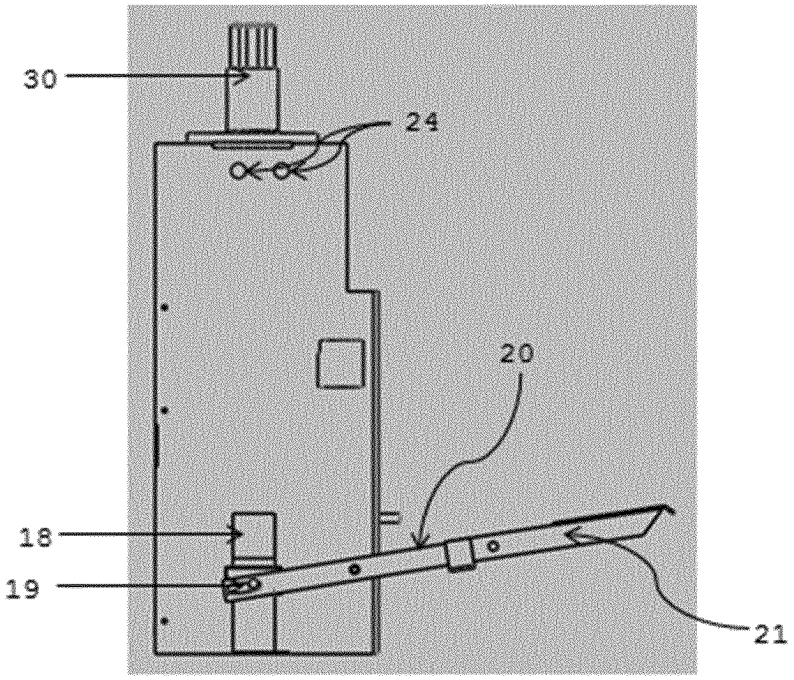

FIG. 4

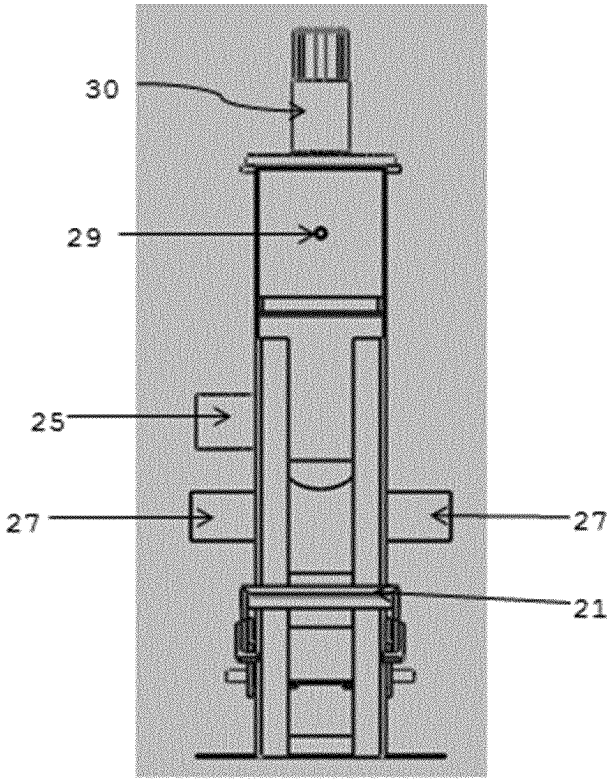

FIG. 5

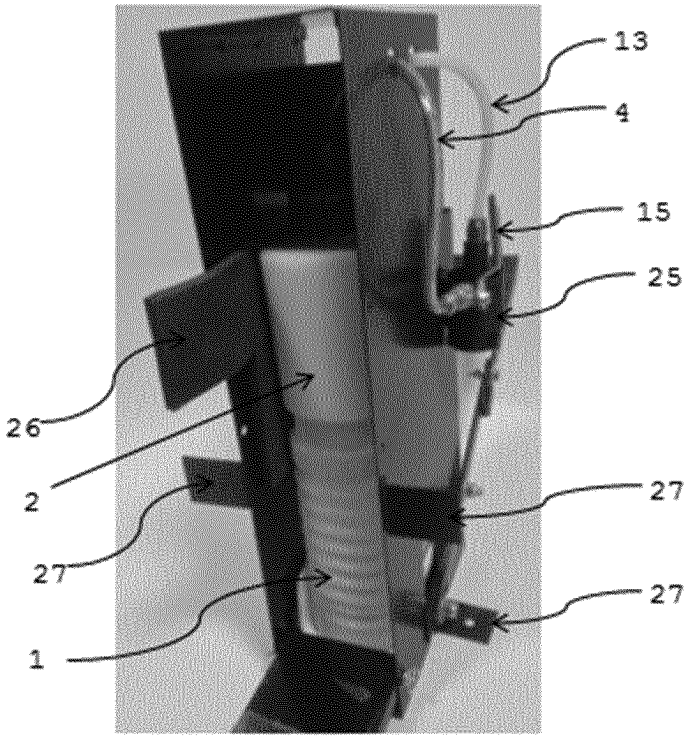

FIG. 6

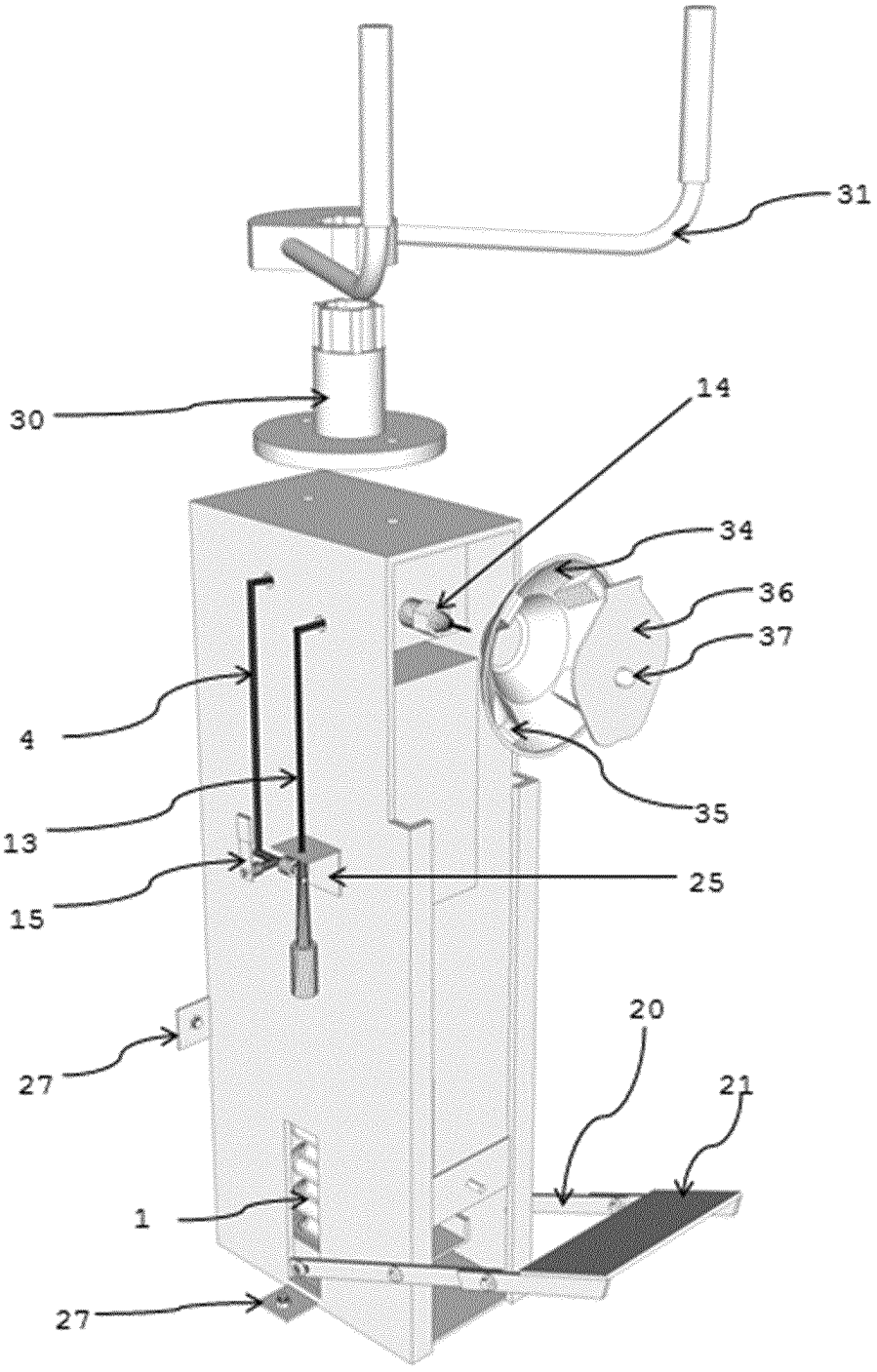

FIG. 7

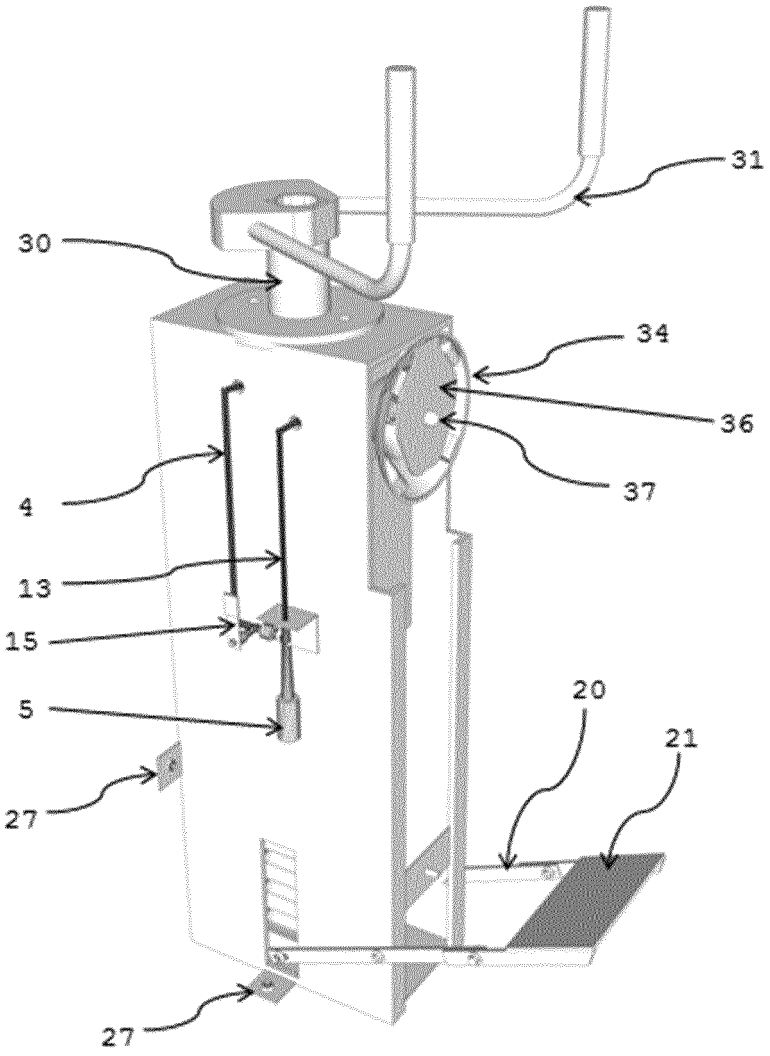

FIG. 8

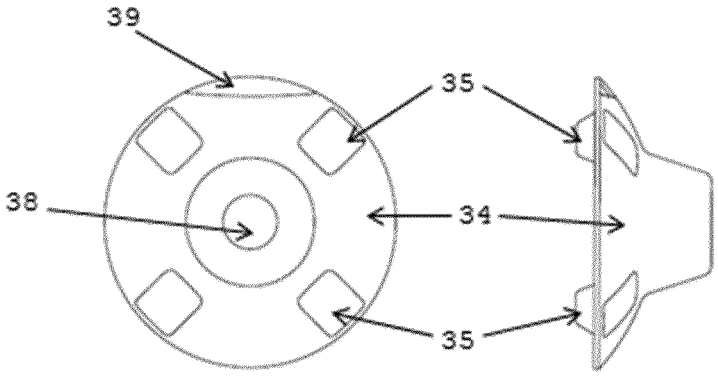

FIG. 9 FIG. 10

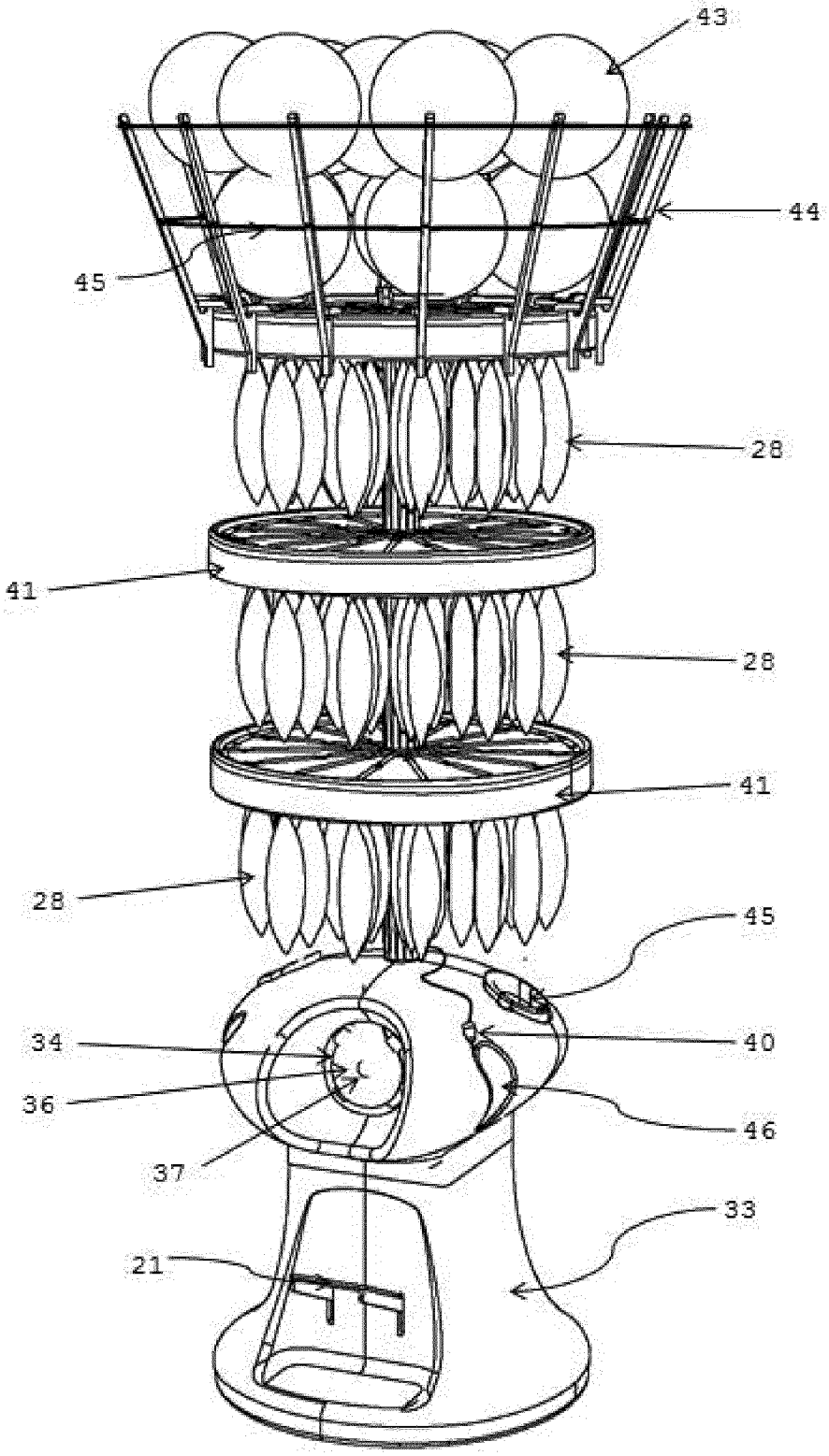

FIG. 11

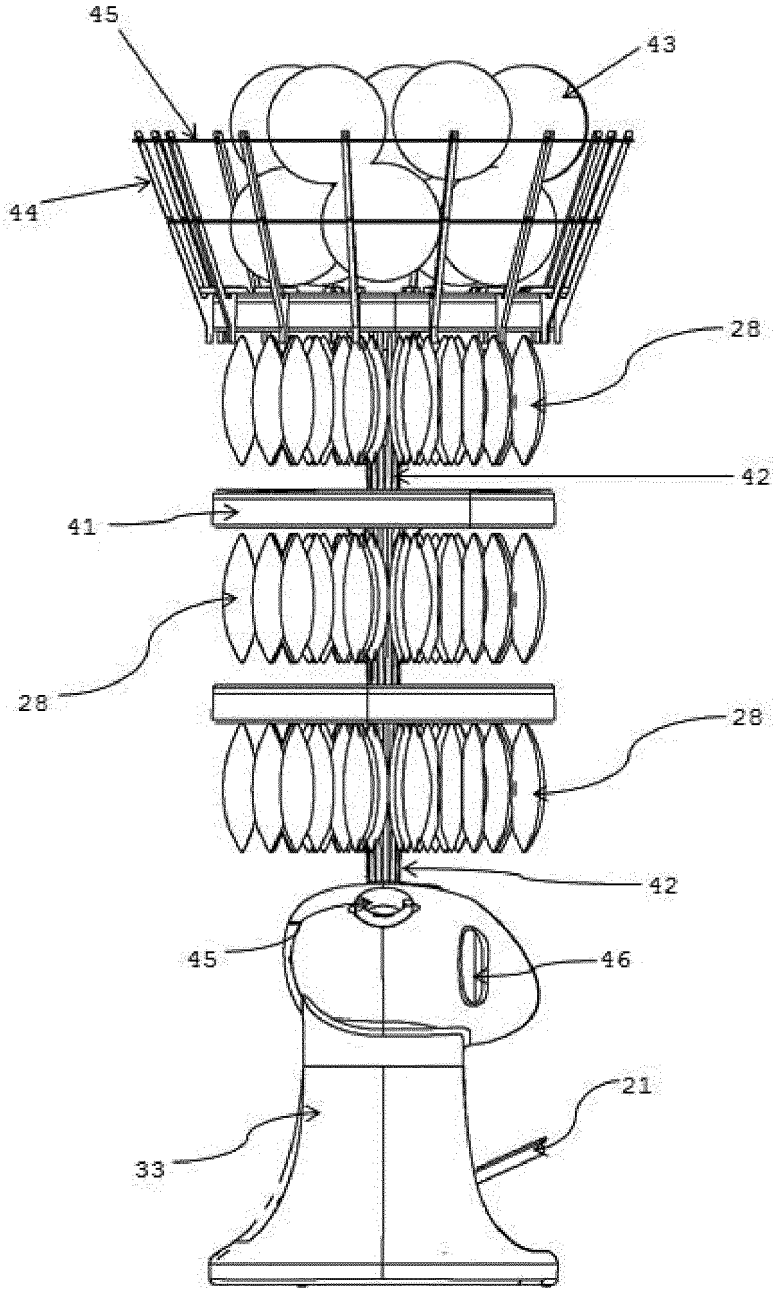

FIG. 12

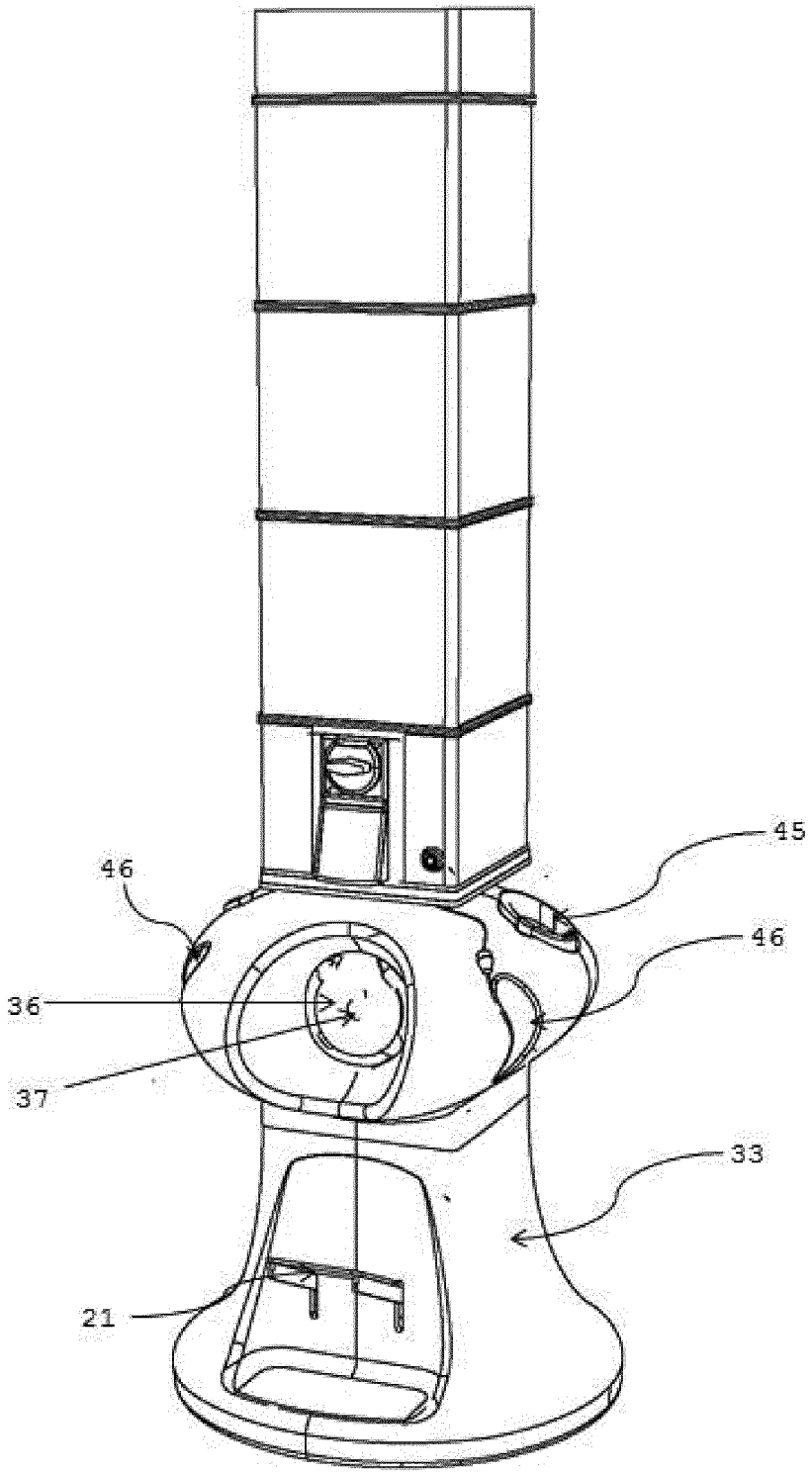

FIG. 13

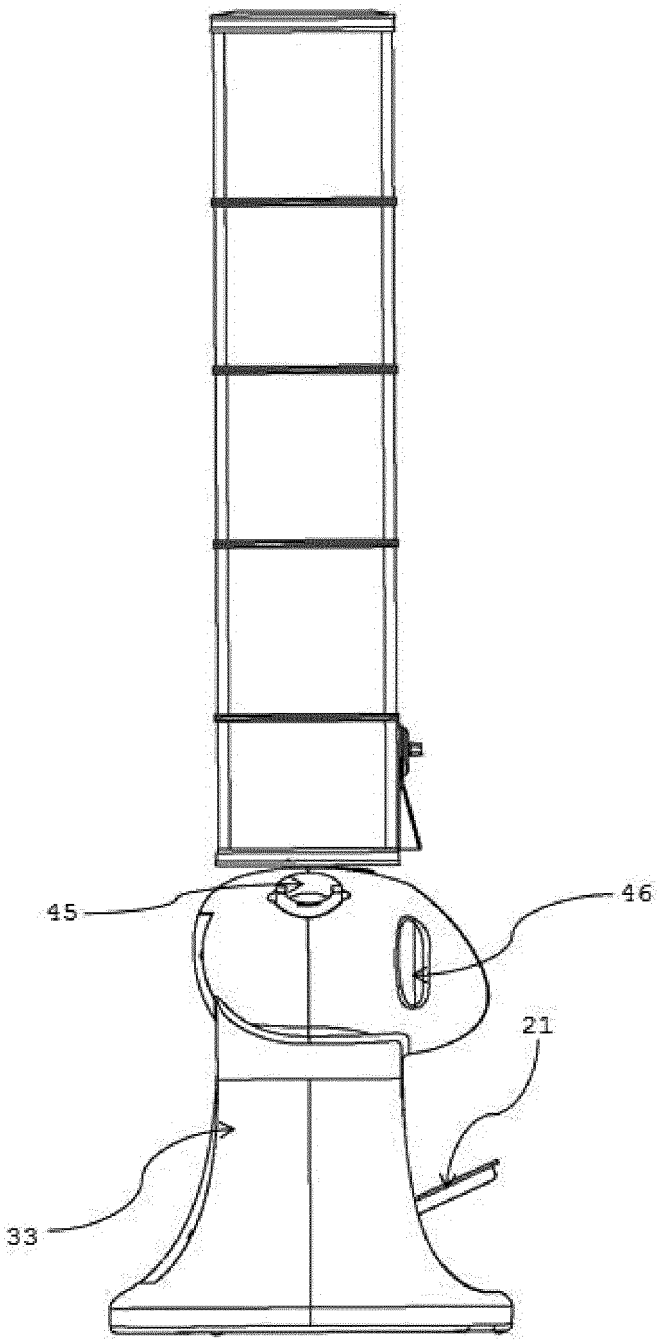

FIG. 14

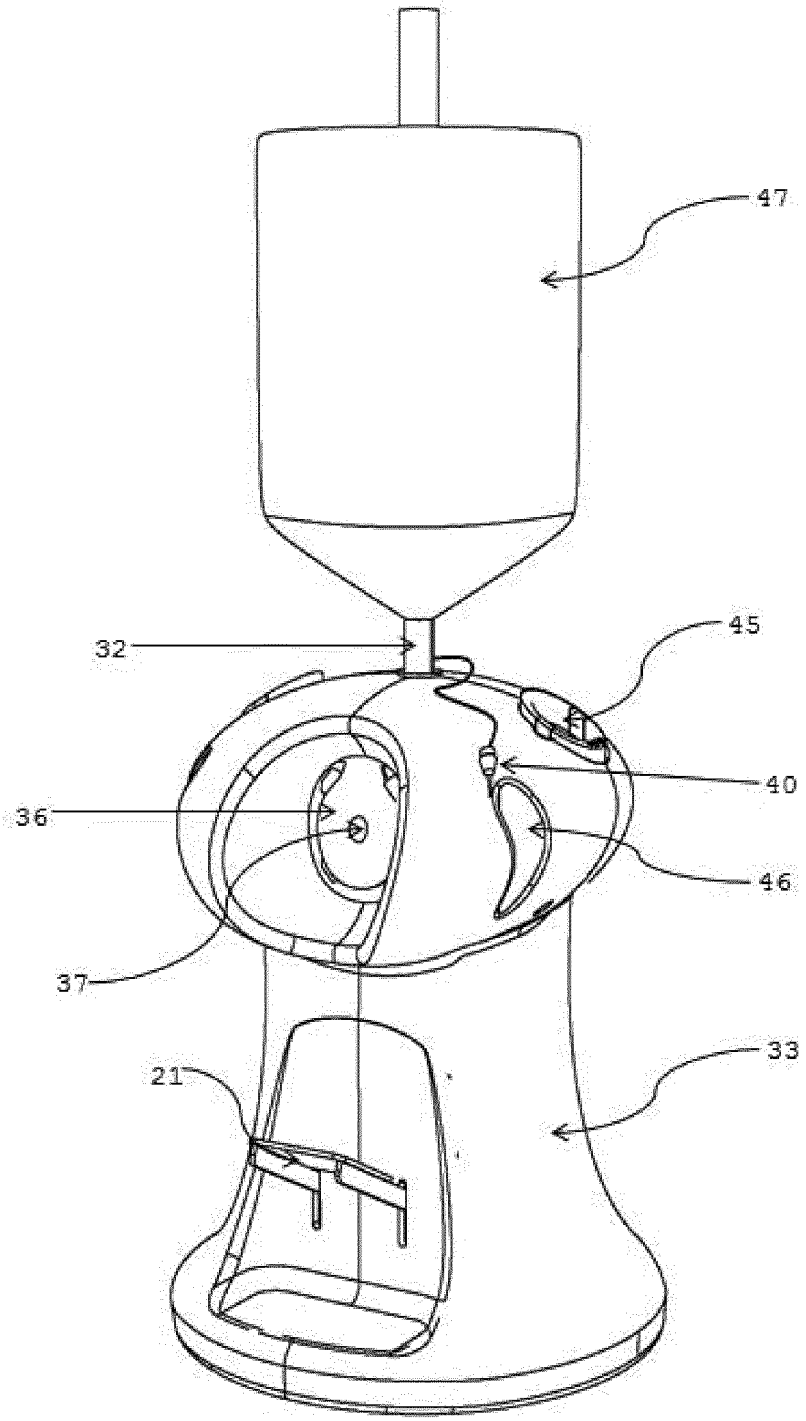

FIG. 15

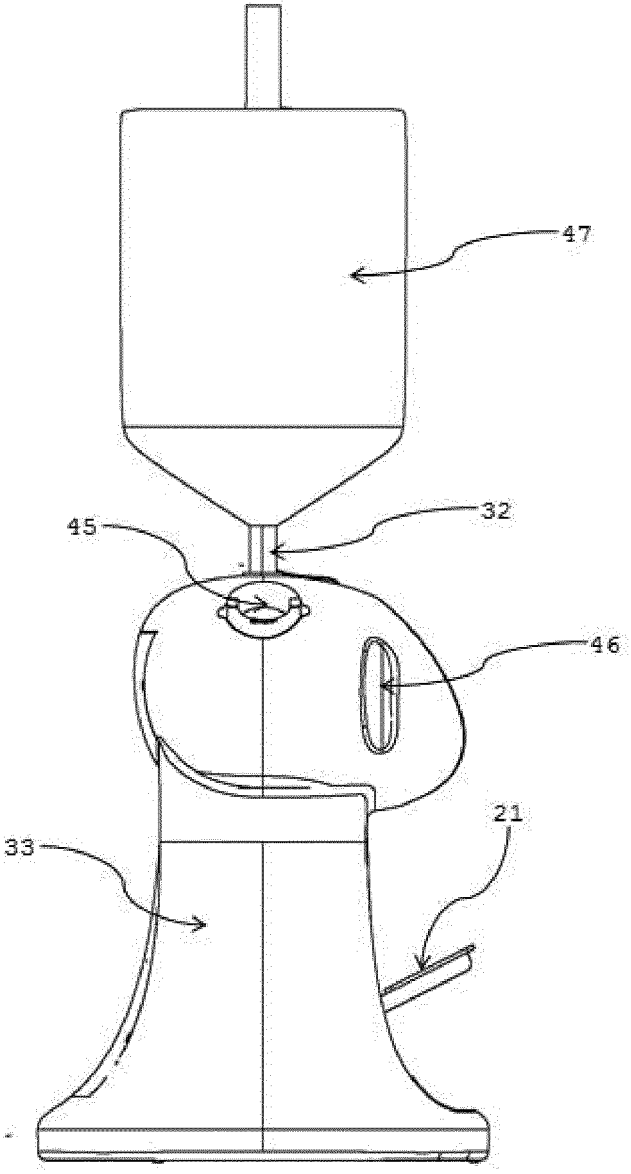

FIG. 16

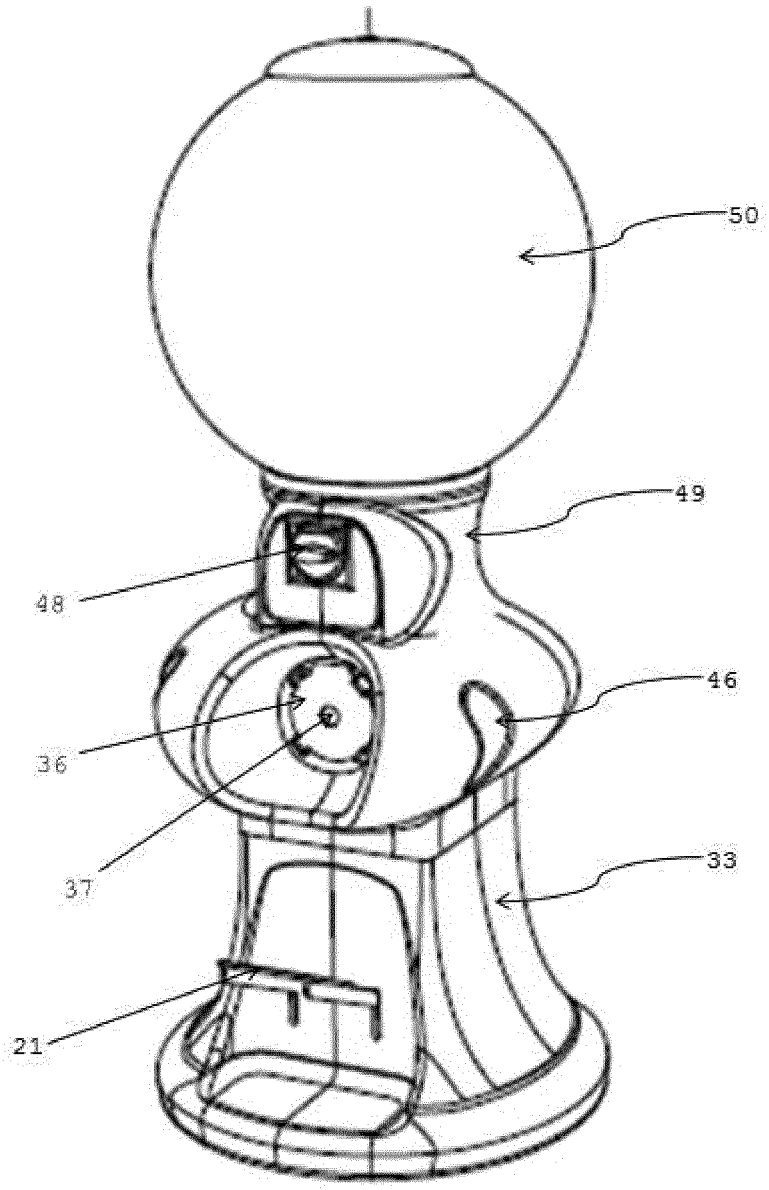

FIG. 17

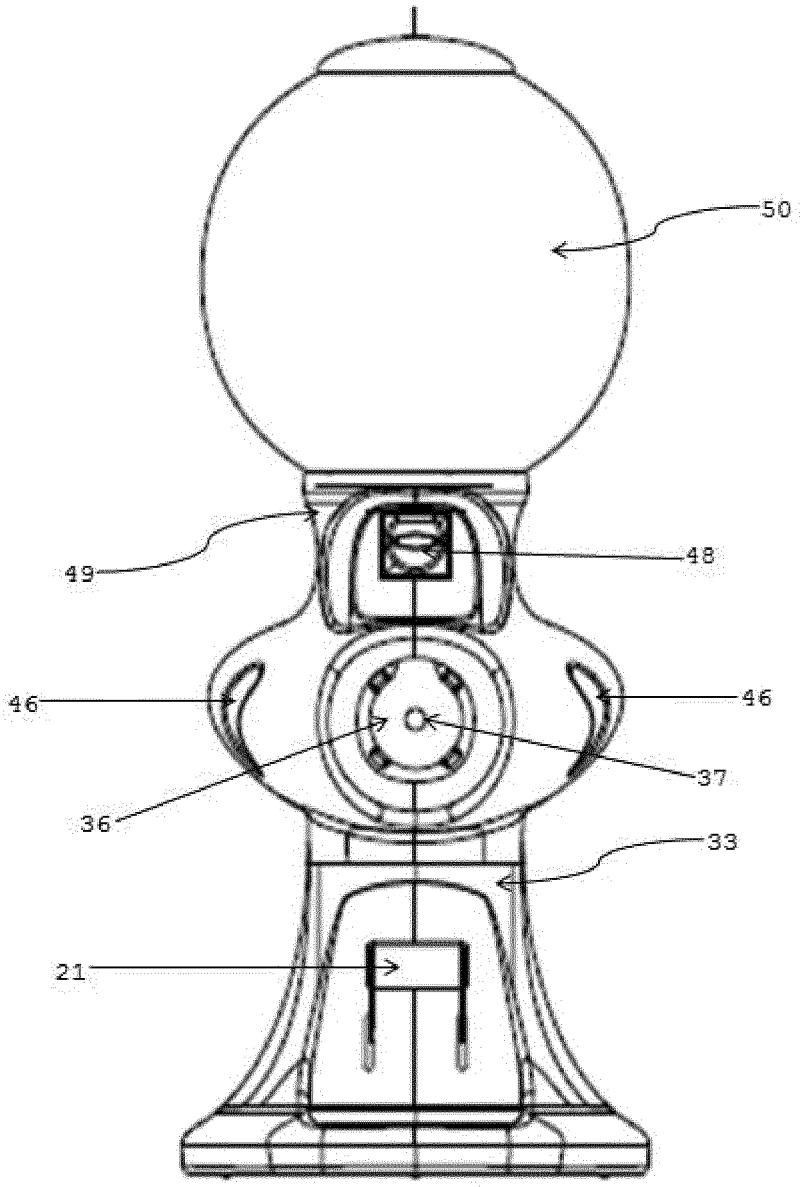

FIG. 18

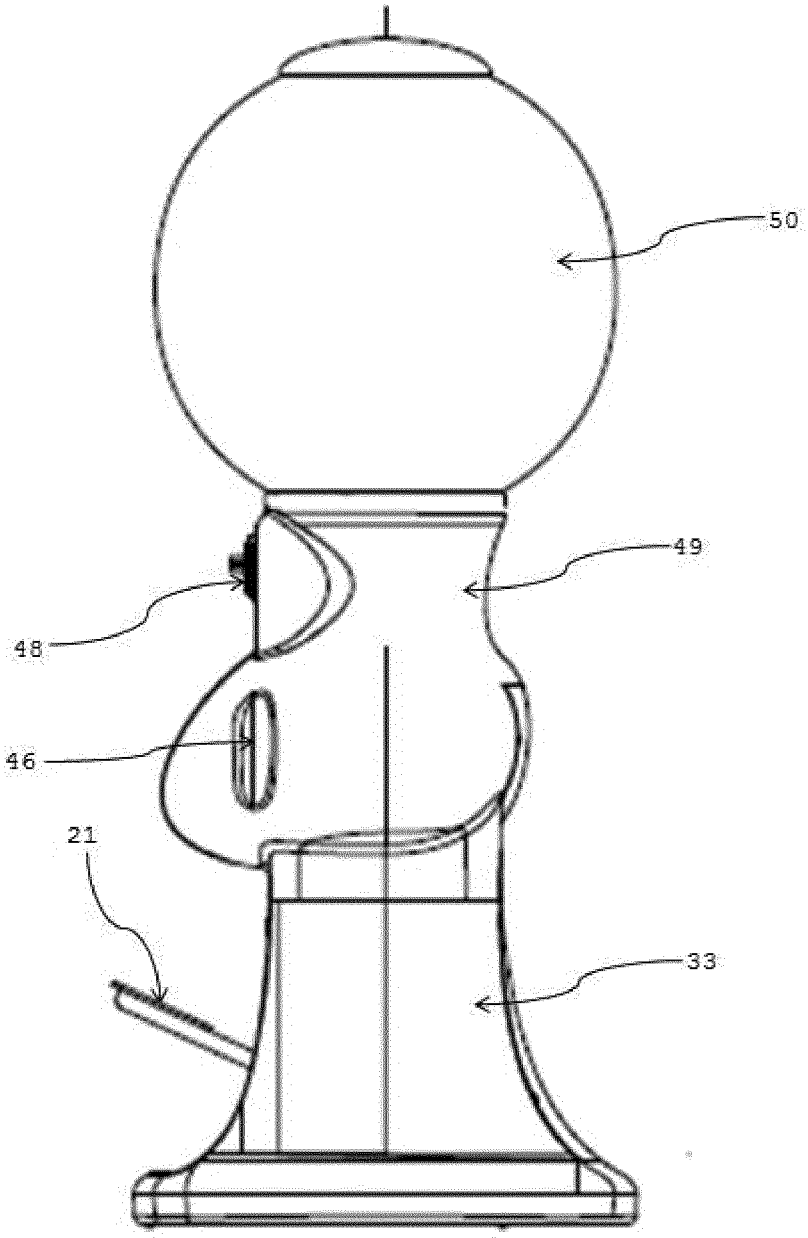

FIG. 19

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- MX 200700215 **[0003] [0007]**
- US 20100190984 A **[0004]**