



(51) International Patent Classification:

A47G 7/06 (2006.01)

F21V 33/00 (2006.01)

(21) International Application Number:

PCT/US2020/031369

(22) International Filing Date:

04 May 2020 (04.05.2020)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

62/842,834

03 May 2019 (03.05.2019)

US

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(81) Designated States (unless otherwise indicated, for every

kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,

OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

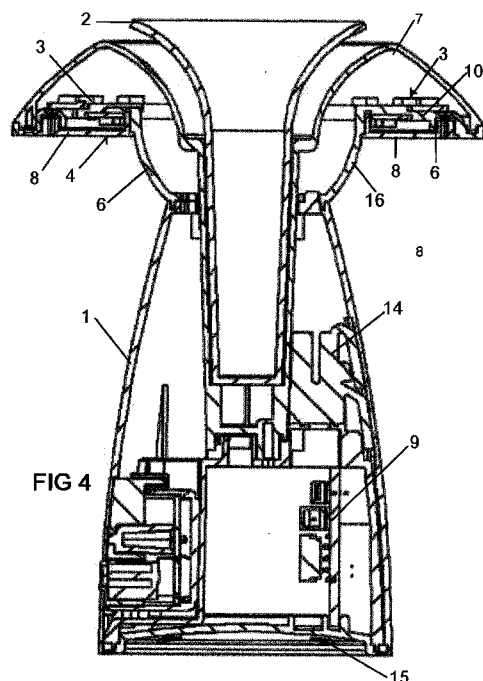
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: FLOWER VASE LAMP



(57) Abstract: A flower vase lamp has an open top housing receiving a tubular flower reservoir; upper and lower rings of LEDs mounted on upper and lower faces of an annular, metal, combination LED heat sink and light barrier encircling the reservoir such that flower illuminating light from the upper ring of LEDs is blocked by the light barrier from illuminating the ambient/housing body exterior and light illuminating the ambient/housing body exterior is blocked by the barrier from illuminating flowers in the reservoir. Upper and lower lenses are mounted over and under the respective rings of LEDs to diffuse light therefrom. The combination heat sink and light barrier is one piece and comprises an annular flange integrally joined to a rim of an open bottomed, spherical bowl-shaped portion to extend horizontally outward from the rim with upper and lower rings of LEDs mounted on upper and lower faces of the flange, respectively.



TITLE: FLOWER VASE LAMP**RELATED APPLICATIONS**

This application incorporates the disclosures of my design patent application No 29/691365, filed May 15, 2019 and my provisional application No. 62/842,834, filed May 3, 2019, from which priority is claimed.

FIELD OF THE INVENTION

The invention relates to a flower vase lamp for illuminating both flowers therein and the ambient/flower lamp housing body exterior, either selectively or simultaneously.

BACKGROUND OF THE INVENTION

A flower vase lamp having first and second groups of LEDs which emit separate beams/sources of light for illuminating both the flowers and the ambient/lamp housing exterior either selectively or simultaneously is known from the prior art. However, in the prior art, the LED groups are insufficiently isolated from each other to prevent some light spilling over to illuminate the flowers when only the ambient/lamp housing exterior is selected for illumination and vice versa, which detracts from the aesthetic visual effect. Additionally, the individual LED's provide points/spots of light too intense for desirably even illumination.

SUMMARY OF THE INVENTION

It is an object of the invention to provide a flower vase lamp having groups of LEDs which provide separate sources of light for illuminating effectively both the flowers and the ambient/flower lamp housing body exterior either selectively or simultaneously.

According to one aspect of the invention, the first and second groups of LEDs are arranged as LED rings mounted on upper and lower faces, respectively, of an annular LED support surrounding the flower stems which provides both a barrier isolating respective light beams from each other and a heat sink for

heat emitted by the LEDs to prevent local overheating. Suitably, the barrier is aluminum.

More particularly, the invention comprises a flower vase lamp comprising an upstanding housing body open at a top; a tubular, flower stem receiving reservoir inserted in the top; an opaque, annular LED support mounted at the top and encircling the reservoir; upper and lower rings of LEDs for illuminating flowers in the reservoir and the ambient/housing body exterior, respectively, mounted on upper and lower faces of the support, respectively, such that flower illuminating light from the upper LED ring is blocked by the support from illuminating the ambient/housing body exterior and light illuminating the ambient/housing body exterior is blocked by the support from illuminating flowers. Upper and lower light diffusing lenses are mounted on the housing body to extend in covering relation over and under the upper and lower LED rings, respectively. Switching/microcontroller means are provided in the housing for operation by a user to activate the upper and lower LED rings alternately or simultaneously.

The lenses mask the points of light emitted by the individual LEDs, assuring light emission as a diffuse glow.

Preferably, LEDs of the upper ring are multicolor (RGBW) and LEDs of the lower ring are white, color selection being enabled by operation of a microcomputer container in the housing. Power is from a battery contained in the housing or from an external power supply.

It is also preferred that the water and flower stem receiving reservoir is removable to permit remote water replenishment, although the reservoir can be filled with water when mounted in the vase without short circuiting any electronic circuitry.

The upward directed light produced by the RGBW LEDs can be any number of static colors as selected by the user, as well as several dynamic patterns of light, such as rotating rainbows, or changing colors of illumination. In one embodiment, these colors and patterns of upward directed light are selected with a single touch sensitive button on the side of the vase housing. In a second embodiment, these colors and patterns are selected using a wireless remote control, either using Radio Frequency or Infrared.

The downward directed white LEDS mounted on the lower surface of the aluminum heat sink, both illuminate the lower part of the exterior of the housing body of the flower vase lamp and provide ambient illumination for the area adjacent the housing body. This white ambient light can be both dimmed and turned on and off as desired under the control of the microcomputer. In one embodiment the user can control the brightness and on/off of the downward facing LEDS with a single touch sensitive button on the side of the vase. In another embodiment, the brightness and on/off are selected using a wireless remote control, either using Radio Frequency or Infrared.

In a first, smallest embodiment, the overall height is approximately 16.5 cm. The lamp has an illuminated area on the top that has a diameter larger than a diameter of the remainder of the body, together forming a mushroom-like shape. All the physical parts of the product, with the exception of the aluminum heat sink, are injection molded of plastic. The one-piece annular heat sink comprises an annular flange integrally joined to a rim of an open bottomed, spherical bowl-shaped part to extend horizontally outward from the rim with upper and lower rings of LEDs mounted on upper and lower faces of the flange, respectively. A base of the bowl seats on an upper end of the base housing.

This embodiment can be powered by self-contained rechargeable batteries and, both powered and recharged by an external DC power supply connected through a power plug located in the rear of the housing body adjacent the base. An LED located just above that plug indicates the charging status of the battery. When external DC power is applied, all the LEDS can reach their full brightness as selected by the user. When operating solely on internal batteries, the maximum brightness is limited, so as to extend the battery life.

Two touch switches are located just below the aluminum heat sink, one below the other.

Top Touch Switch - When the top LEDS are Off: The top RGBW LEDs will all light in a red color. Touching subsequent times, they will cycle through various static colors, for example - Red, Blue, Green, Pink, Magenta, White. Then on the next touch, all LEDs will cycle through the rainbow colors, repeating that about every 4 seconds. All LEDs are the same color. On the

next touch, the color will stop at whatever color it was when it was touched, and remain that color. On a subsequent touch, a rotating rainbow will run, whereby each LED will be a different color of the rainbow, and those colors will rotate around the circle of LEDs, at a rate of about 1 revolution every 2 seconds. On the next touch the top LEDs will turn off.

Bottom sensor (down light icon). Pressing and releasing within 1 second turns the lower white LEDs on or off. Pressing and holding for more than 2 seconds causes the lamp to dim up and down and to remain at the brightness prevailing at the time of release.

The second, embodiment has an overall height of about 30 cm, and a housing body constructed out of spun aluminum. The circular top is of greater diameter than the housing body, somewhat similar to the top of the first version and made of plastic, as is a downward facing lens for the white ambient LEDs. The unit is powered by an external source via a DC jack adjacent the base of the rear.

A combination LED support, heat sink and light barrier comprises an annular flange outturned from an upper lip of the aluminum housing with which it is integrally formed in one piece.

Since the majority of the product is aluminum, it would be difficult to have 2 capacitive touch switches for control, as we do in the first version. A remote is therefore used to control both the upper and lower LEDs.

A third, largest embodiment has a height of approximately 40 centimeters, and is constructed of a ceramic. A flower receiving top comprises a small circular annulus of plastic, as does the downward facing lens for the white ambient LEDs. The combined LED support, heat sink and light barrier The unit will be powered by a DC jack located at the bottom back of the product.

Since the majority of the product is ceramic, on similar reasoning it would be difficult to have 2 capacitive touch switches for control, as we do in the first version. Operation of both the upper and lower LEDs is controlled by a remote.

All functions including reading the switches, reading the remote-controller and controlling the RGBW and white LEDs are performed by a single chip 8-bit micro processor. The intensity and color mixing of the LEDs is achieved by varying the duty cycle of each of the LEDs. Frequency modulation is employed. Either standard LEDs may be used, or "Smart LEDs" which have a built-in controller in each LEDs are employed. Standard LEDs will be arranged in a matrix and scanned by the processor in order to reduce the number of I/O pins needed. "Smart LEDs", are driven in a daisy-chain by a single serial data output from the processor.

Controls:

On-Off: (0/1 as standard) When the Vase Lamp is Off, pressing On-Off turn the lamp on to the state it was in when it was last turned off. Pressing while the lamp is On, turns it off and remembers it's state.

Color Select: Cycles through 5 colors and white with each quick (less than 1.5 seconds) press and release. Pink, Red, Orange, Green, Blue, White and back to Pink, etc... Press and Hold for 1.5 seconds to turn off the Flower LEDs. Press again to turn back on.

Rainbow Start-Stop: Pressing while not in Rainbow mode causes the lamp to go into Rainbow mode, displaying a constantly changing color that takes 40 seconds to cycle through all the colors and back to the original color.

Pressing the button while in Rainbow Mode, causes that color to stay and the rainbow mode to stop.

Spin Rainbow: Pressing this causes a rotating rainbow that takes 2.5 seconds to complete one revolution around the top RGBW LEDs.

Flower Brightness Up: Pressing and holding increases the brightness of the upper RGBW Flower LEDs until it reaches Max brightness, and at that point holding it has no more effect.

Flower Brightness Dn: Pressing and holding decreases the brightness of the upper RGBW Flower LEDs until it reaches Min brightness, and at that point holding it has no more effect.

Lamp On-Off: When the lower white LEDs are Off, pressing Lamp On-Off turns white lamp LEDs on to brightness they were last on when they were last turned off. Pressing while the white lamp LEDs are On, turns them off and remembers it's brightness state.

Lamp Brightness Up: Pressing and holding increases the brightness of the lower white lamp LEDs until they reaches Max brightness, and at that point holding it has no more effect.

Flower Brightness Down: Pressing and holding decreases the brightness of the lower white lamp LEDs until they reaches Min brightness, and at that point holding it has no more effect.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be readily understood, specific embodiments of flower lamp vases according to the invention thereof will now be described by way of example only and with reference to the accompanying drawings in which:

Figure 1 is a front perspective view of a first embodiment of the invention;
Figure 2 is an exploded view showing, schematically, the main components of the first embodiment and their relative locations in the vase housing;
Figure 3A is a top plan view of the first embodiment;
Figure 3B is perspective view from above and one side;
Figure 3C is an elevational view of one side;
Figure 3D is a cross-sectional view taken along the lines A-A of figure 3C;
Figure 3E is an elevational view of an opposite side to that of Figure 3C;
Figure 3F is a cross-sectional view taken along the lines B-B of figure 3E;
Figure 4 is similar view to Figure 3D at an enlarged scale;
Figure 5 is similar to Figure 3F at an enlarged scale;
Figure 6A is a perspective view from above and one side of a second embodiment of the invention;
Figure 6B is a perspective view from below and an opposite side of the second embodiment of the invention;
Figure 7 is a cross-sectional view in a vertical plane of the second embodiment;
Figure 8A is a perspective view from above and one side of a third embodiment of the invention;
Figure 8B is a perspective view from below and an opposite side of the third embodiment;

Figure 9 is a cross-sectional view in a vertical plane of the second embodiment.

The first embodiment of flower vase lamp shown in Figures 1-5 comprises an upstanding housing body 1 open at a top; a water and flower stem receiving tubular reservoir 2 inserted, removably, into the open top; upper and lower rings of LEDs 3 and 4, respectively for illuminating the flowers (not shown) and the ambient/ housing body 1, mounted, respectively, on upper and lower faces of an annular, aluminum support 6 mounted on the top and encircling the reservoir 2. The support provides a combination heat sink and light barrier, such that flower illuminating light from the upper LED ring 3 is prevented from illuminating the ambient/vase housing exterior and *vice versa*. The combination heat sink and light barrier is one piece and comprises an annular flange 10 integrally joined to a rim of an open bottomed, spherical bowl-shaped portion 16 to extend horizontally outward from the rim with upper and lower rings of LEDs mounted on upper and lower faces of the flange, respectively upper and lower light diffusing lenses 7 and 8, respectively, are mounted on the top of the housing to extend in covering relation over and under the upper and lower LED rings 3 and 4, respectively.

The upper light diffusing lens 7 is funnel shape with a depending tubular socket in which the stem of the reservoir nests. The bowl portion of the combination heat sink seats on an upper end of the base housing surrounding the depending tubular lens socket and the stem of the reservoir nested therein and extending through the bottom opening. The bowl shape structure provides an increase in thermal capacity while also being desirably spaced apart from most heat sensitive plastic surfaces.

The housing also contains a controller board 9 to activate the LEDs in the upper and lower LED rings 3 and 4 alternately, or simultaneously, and, a rechargeable battery 11, a power plug socket/holder 12; a cover 13 therefor; a locating bracket 14; and, a bottom cover 15 for the base housing.

The lenses mask the points of light emitted by the individual LEDs assuring light emission as a diffuse glow.

LEDs of the upper ring are multicolor (RGBW) and LEDs of the lower ring are white, color selection being enabled by operation of a microcomputer

container in the housing. Thus, power is available either from the housing battery contained in the housing or from an external power supply.

The water and flower stem receiving tubular vessel/reservoir is removable to permit remote water replenishment, although the reservoir may be filled with water when mounted in the vase without short circuiting any electronic circuitry.

In the second and third embodiments, components having some similarity of functions to those of first embodiment are indicated by primed and double primed reference numbers, respectively.

CLAIMS

1. A flower vase lamp comprising an upstanding housing body having an open top; an elongate, tubular, flower stem receiving reservoir mounted in the open top to extend downward into the housing body; an annular LED support of opaque, thermally conducting material mounted at the top to encircle the reservoir; an upper ring of LEDs and a lower ring of LEDs for illuminating flowers in the reservoir and for illuminating the ambient/housing body exterior, respectively, mounted on upper and lower faces of the support, respectively, such that the support provides a combination LED heat sink and light barrier such that flower illuminating light from the upper ring of LEDs is blocked by the barrier from illuminating the ambient/housing body exterior and light illuminating the ambient/housing body exterior is blocked by the barrier from illuminating flowers; means for connecting a power source to respective LEDs; and, switching/microcontroller means to control the power source to power the upper ring of LEDs and the lower ring of LEDs alternately or simultaneously.
2. A flower vase lamp according to claim 1 wherein the combination heat sink and light barrier is one piece and comprises an annular flange integrally joined to a rim of an open bottomed, spherical bowl-shaped portion to extend horizontally outward from the rim with upper and lower rings of LEDs mounted on upper and lower faces of the flange, respectively.
3. A flower vase lamp according to claim 1 wherein the housing body is spun aluminum and the combination heat sink and light barrier comprises an annular flange outturned from an upper lip of the aluminum housing body with which it is integrally formed in one piece.

4. A flower vase lamp according to any one of claims 1 to 3 wherein upper and lower, annular, light diffusing lenses are mounted on the top of the housing body to extend in covering relation over and under the upper LED ring and the lower LED ring, respectively, to diffuse light emitted by the LEDs of respective rings.
5. A flower vase lamp according to any one of the preceding claims wherein LEDs of the upper ring are multicolor (RGBW) and LEDs of the lower ring are white, color selection being enabled by operation of the switching/controller means.
6. A flower vase lamp according to any one of the preceding claims wherein the flower stem receiving tubular reservoir is removable through the open top of the housing to permit remote water replenishment.
7. A flower vase lamp according to anyone of the preceding claims wherein the reservoir is funnel shaped with a depending stem with a blind end and the upper light diffusing lens 7 is funnel shape with a depending tubular socket in which the stem of the reservoir nests; the bowl portion of the combination heat sink seats on an upper end of the base housing surrounding the depending tubular lens socket and the stem of the reservoir nested therein extending through the bottom opening.
8. A flower vase lamp according to any preceding claim wherein the switching/controller means is programmed for user operation to select different illumination sequences and colors of the the upper ring of LEDs and different dynamic patterns of light.
9. A flower vase lamp according to claim 6 wherein user operation to select different illumination sequences and colors of the upper ring of LEDs and different dynamic patterns of light is enabled by one of a

single touch sensitive button on the body of the flower vase lamp and a wireless remote control, using one of RF and Infrared.

10. A flower vase lamp according to any preceding claim wherein the support is aluminum.
11. A flower vase lamp comprising an upstanding body with an open, flower receiving top; an annular, metal barrier having a reflective upper face and a reflective lower face and mounted encircling the open, flower receiving top; a first, flower illuminating ring of LEDs and a second, vase body/ambient illuminating ring of LEDs mounted, respectively, on the upper face and on the lower face of the annular, respectively, and means for a user to selectively power the first ring of LEDs and the second ring of LEDs alternately or together to illuminate one of the flowers and the vase separately or together, such that the annular metal barrier functions both as a heat sink for the LEDs and blocks light emitted by the flower illuminating ring of LEDs from spilling on to a lower part of the vase body/ambient and blocks light emitted by the vase body/ambient illuminating ring of LEDs from spilling on to flowers received in the top of the vase.
12. A flower vase lamp according to claim 9 wherein the metal barrier is made of aluminum.

ABSTRACT

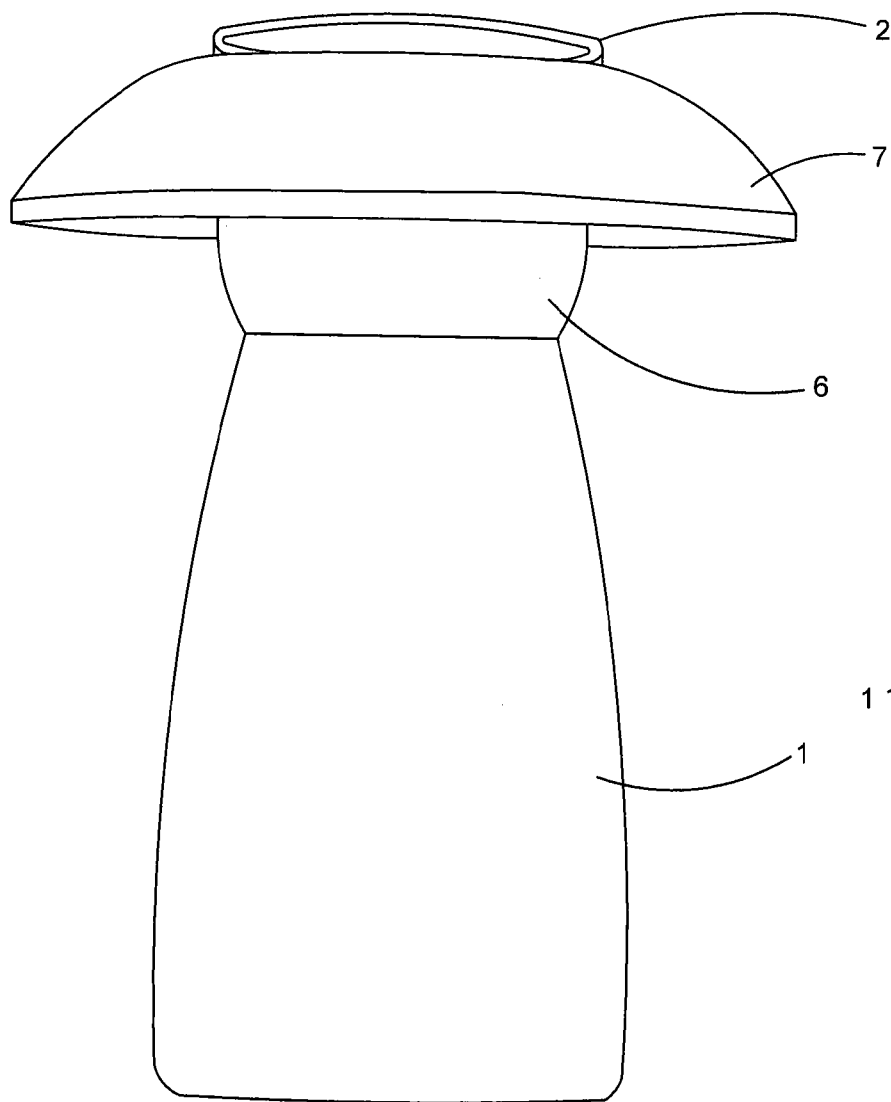


FIG. 1

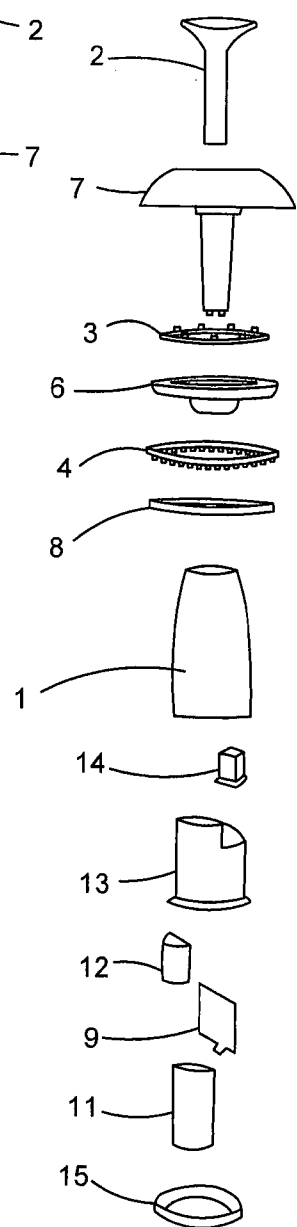


FIG. 2

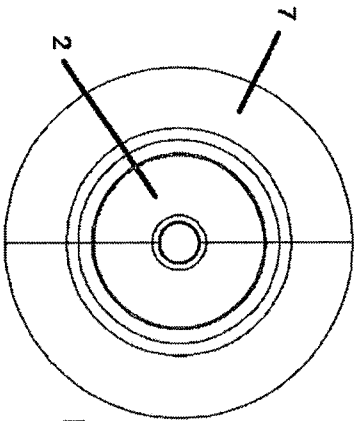


FIG 3A

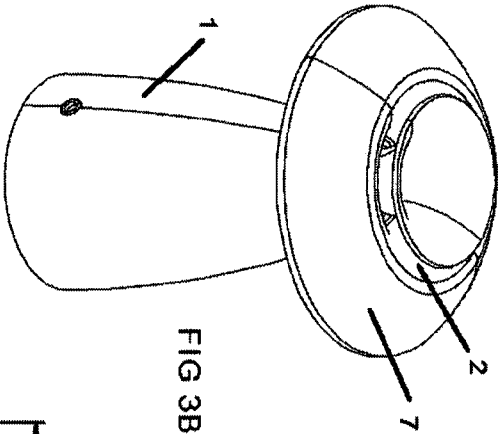


FIG 3B

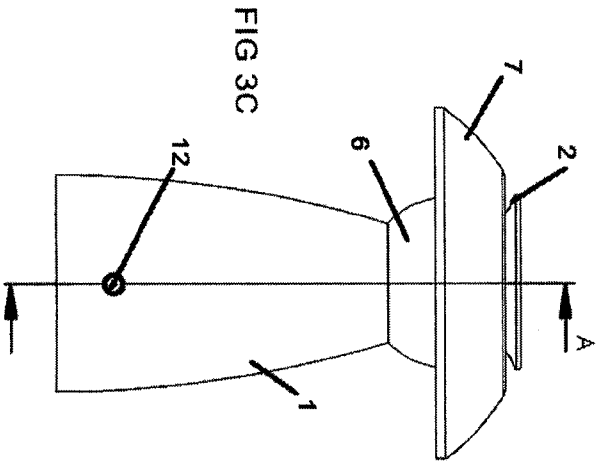


FIG 3C

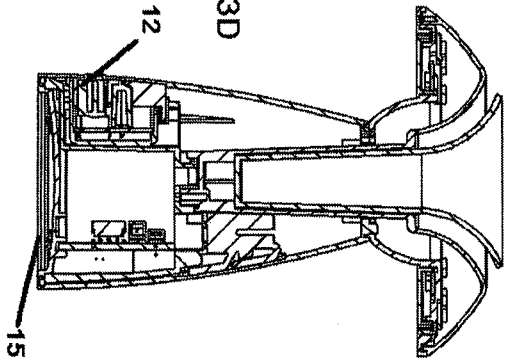


FIG 3D

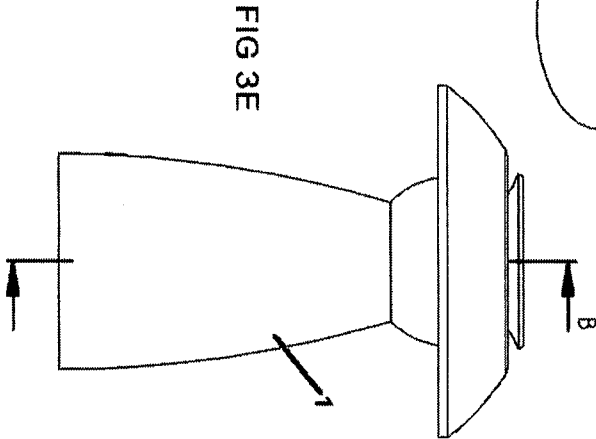
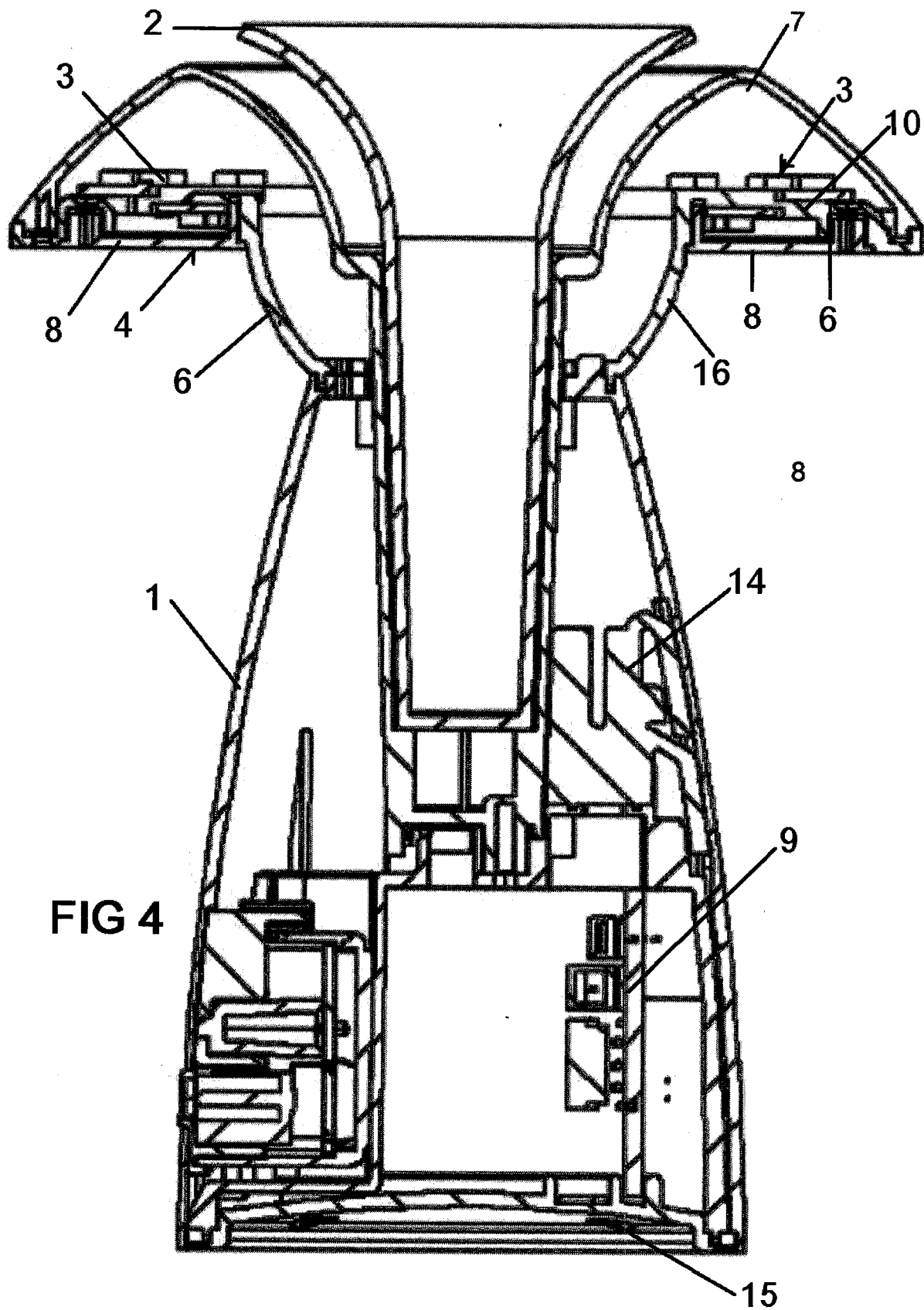
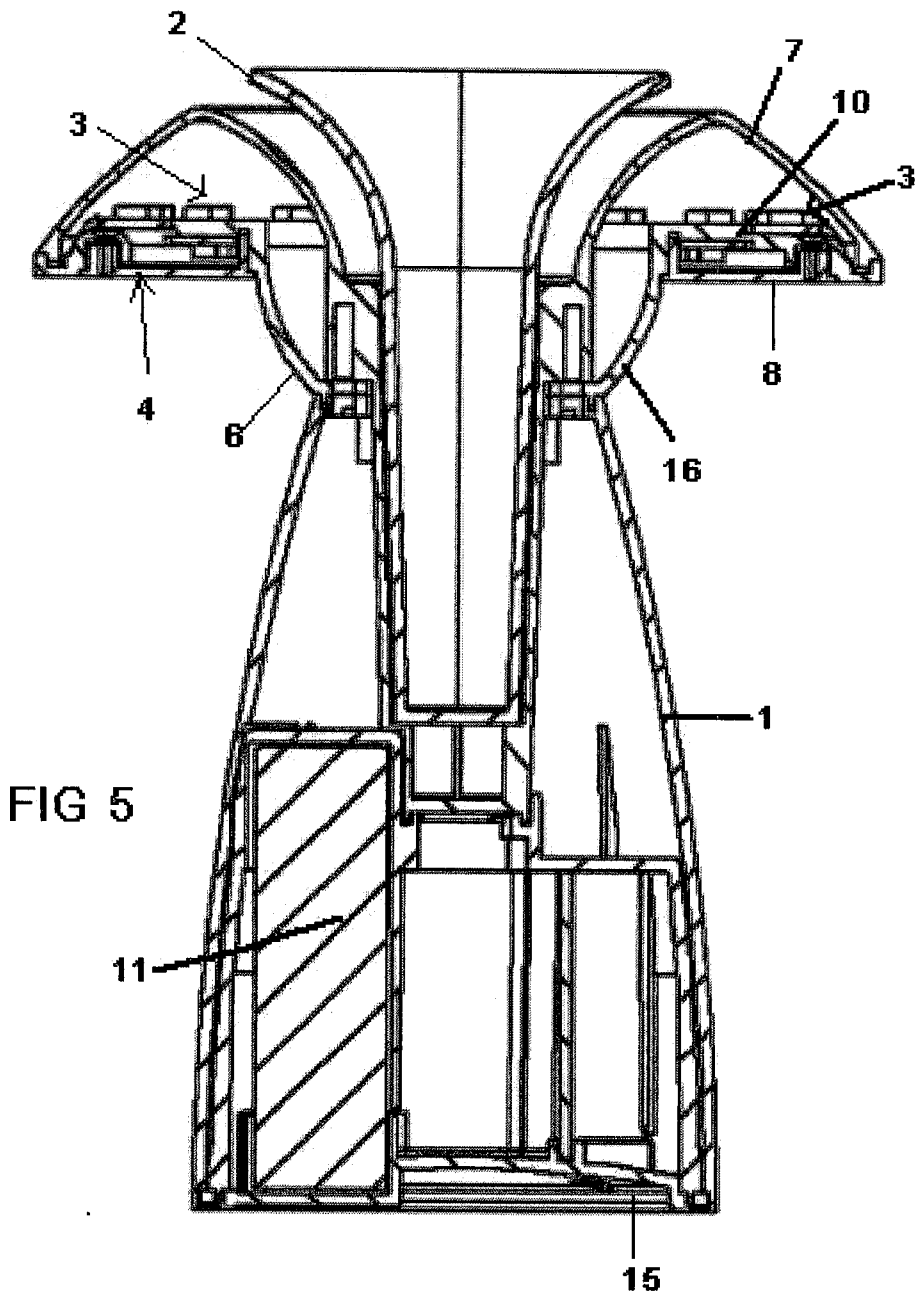


FIG 3E

FIG 3





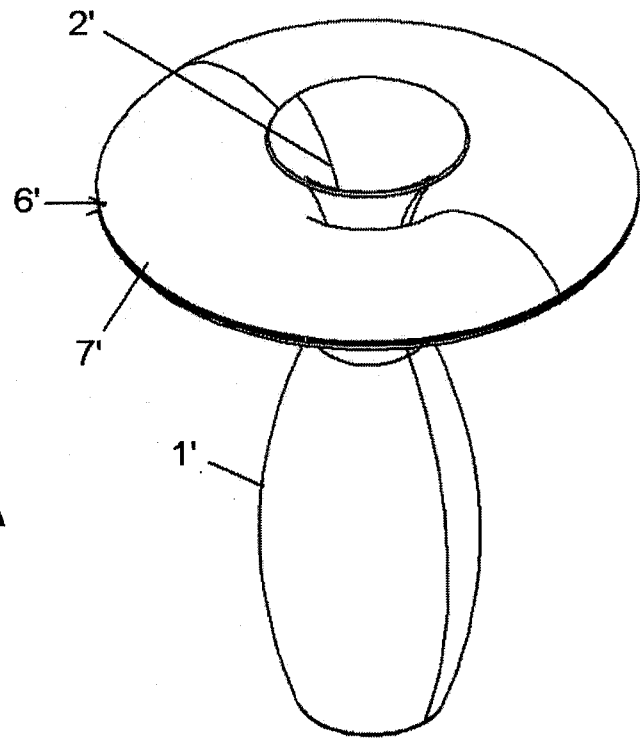


FIG 6A

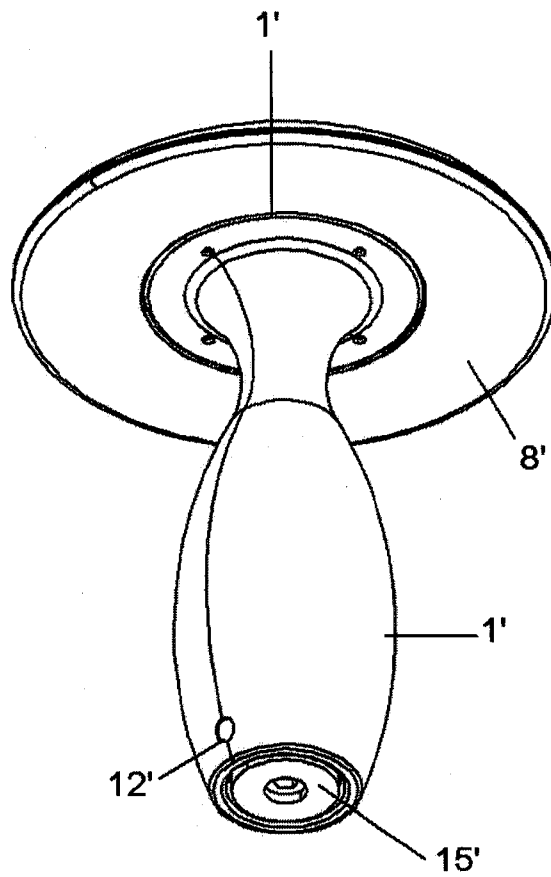
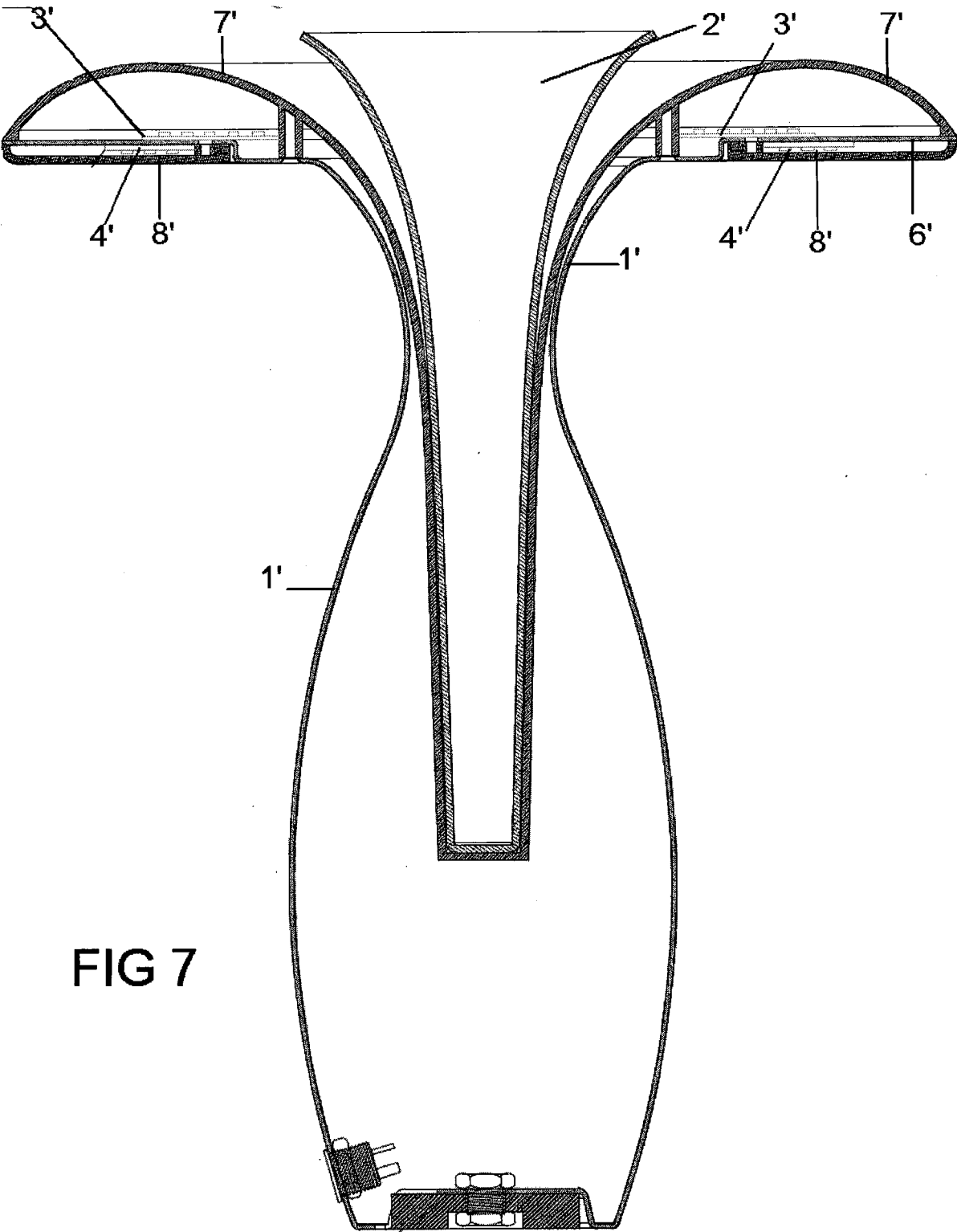


FIG 6B



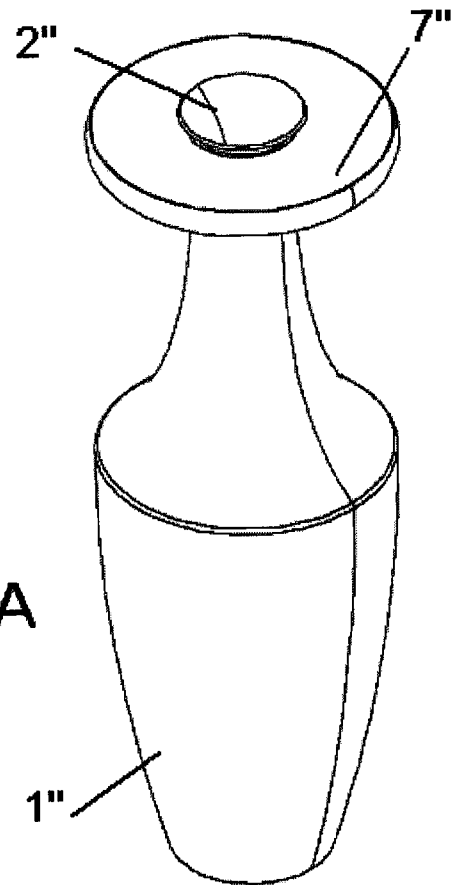


FIG 8A

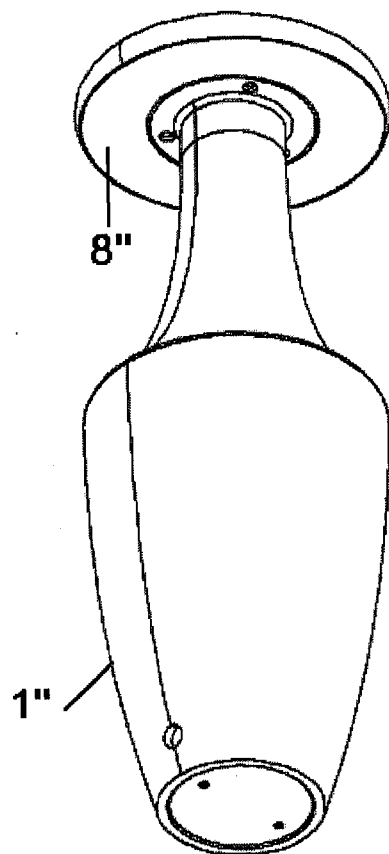
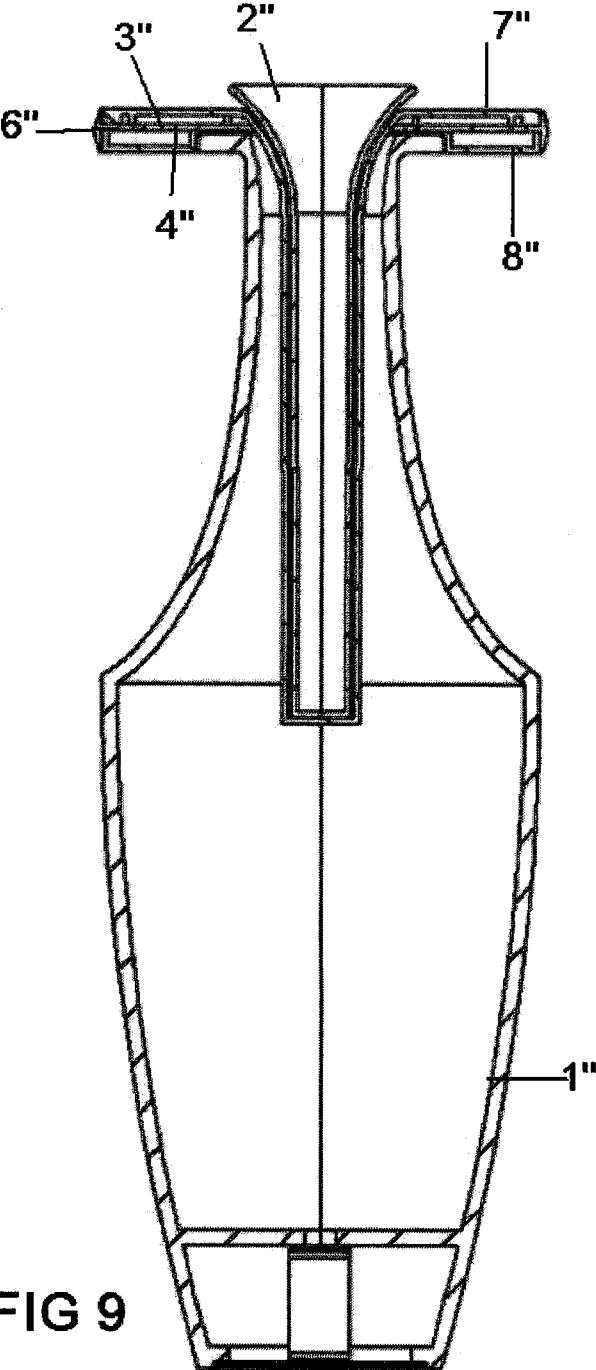


FIG 8B



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 2020/031369

A. CLASSIFICATION OF SUBJECT MATTER <i>A47G 7/06 (2006.01)</i> <i>F21V 33/00 (2006.01)</i> 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) A47G 7/00, 7/06, F21V 23/00, 23/04, 33/00 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) PatSearch (RUPTO internal), USPTO, PAJ, K-PION, Esp@cenet, Information Retrieval System of FIPS		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 3928390 B2 (KURIBAYASHI TERUO) 13.06.2007	1-4, 7, 8, 10, 11
A	CN 201718881 U (SHANGHAI ZIHENG INNOVATION PRODUCTS DESIGN CO LTD) 26.01.2011	1-4, 7, 8, 10, 11
A	CN 202858601 U (ZHONG QIANG) 10.04.2013	1-4, 7, 8, 10, 11
A	CN 203633886 U (ZHAO LUQING) 11.06.2014	1-4, 7, 8, 10, 11
A	CN 202118843 U (SHANGHAI ZIHENG CREATIVE PRODUCTS DESIGN CO LTD) 18.01.2012	1-4, 7, 8, 10, 11
☐ Further documents are listed in the continuation of Box C. ☐ 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 “D” document cited by the applicant in the international application “E” earlier document 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 27 July 2020 (27.07.2020)	Date of mailing of the international search report 30 July 2020 (30.07.2020)	
Name and mailing address of the ISA/RU: Federal Institute of Industrial Property, Berezhkovskaya nab., 30-1, Moscow, G-59, GSP-3, Russia, 125993 Facsimile No: (8-495) 531-63-18, (8-499) 243-33-37	Authorized officer E. Starostina Telephone No. 499-240-60-15	

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 2020/031369

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claims Nos.: 5, 6, 9, 12
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.