(12) STANDARD PATENT (11) Application No. **AU 2010276032 B2**
(19) AUSTRALIAN PATENT OFFICE

(54) Title
Feeding apparatus

(51) International Patent Classification(s)
A61J 17/00 (2006.01)

(21) Application No: **2010276032** (22) Date of Filing: **2010.05.21**

(87) WIPO No: **WO11/009284**

(30) Priority Data

(31) Number	(32) Date	(33) Country
200920306690.8	**2009.07.22**	**CN**
200920314008.X	**2009.11.04**	**CN**
12/782,723	**2010.05.19**	**US**

(43) Publication Date: **2011.01.27**
(44) Accepted Journal Date: **2014.07.10**

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(56) Related Art
CN 201275285
US 5395392
US 6161710
2010276032
US 2004/0144744

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
27 January 2011 (27.01.2011)

PCT

(10) International Publication Number
WO 2011/009284 A1

(51) International Patent Classification:
A61J 17/00 (2006.01)

(21) International Application Number:
PCT/CN2010/000724

(22) International Filing Date:
21 May 2010 (21.05.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
200920306690.8 22 July 2009 (22.07.2009) CN
200920314008.X 4 November 2009 (04.11.2009) CN
12/782,723 19 May 2010 (19.05.2010) 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, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, 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, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, 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, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

Published:

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

(54) Title: FEEDING APPARATUS

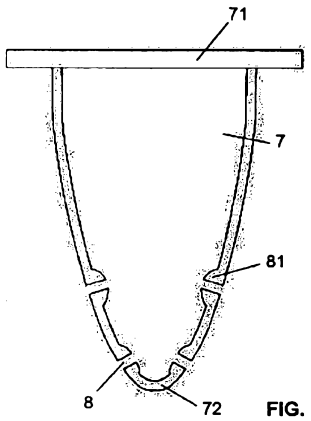

FIG. 30

(57) Abstract: A feeding apparatus includes a food container (7). The food container (7) includes an open end (71) and a closed end (72). The food container (7) is provided on a surface thereof with a plurality of apertures (8) and a plurality of protrusions (81). The food container (7) is made of a resilient material for use with foodstuff.

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FEEDING APPARATUS

FIELD OF PATENT APPLICATION

The present application relates to a feeding apparatus.

BACKGROUND

Milk bottles are used to contain liquid state food such as milk and beverage for feeding infants. However, there is no suitable feeding apparatus to hold small pieces of cut fruit such as pear, apple and vegetable for feeding infants. There is a need to provide a feeding apparatus that can be used to feed infants with food such as fruit, jelly, yogurt, fish, meat, etc.

SUMMARY

In one aspect, a feeding apparatus includes a food container, and the food container includes an open end and a closed end. The food container is provided on a surface thereof with a plurality of apertures and a plurality of protrusions. The food container is made of a resilient material for use with foodstuff.

The protrusions may be formed on an outer surface and/or an inner surface of the food container.

The apertures may be circular in shape with a diameter of about 1 mm to about 5 mm.

The food container may include a plurality of apertures closer to the closed end and a plurality of apertures farther from the closed end. The dimension of the apertures closer to the closed end is smaller than the dimension of the apertures farther from the closed end.

The distance between two adjacent apertures may be about 2 mm to about 10 mm.

The protrusions may be formed between two adjacent apertures.

The resilient material for use with foodstuff may be selected from the group consisting of silicone, latex, and rubber.

The food container may be generally in the shape of a nipple of a milk-feeding bottle.

The shape of the food container may generally conform to the shape of the mouth of an infant.

The food container may taper into a rounded end in cross section.

The thickness of the food container may be about 1 mm to about 6 mm.

In another aspect, a feeding apparatus includes: a food container having an open end and a closed end; a first coupling member having an opening in communication with the open end of the container, the food container being coupled to the first coupling member; and a second coupling member cooperating with the first coupling member and movable between an open configuration allowing food to pass through the opening and into the food container, and a closed configuration

where the second coupling member covers the opening of the first coupling member thereby sealing the open end of the food container. The food container is provided on a surface thereof with a plurality of apertures and a plurality of protrusions, the food container being made of a resilient material for use with foodstuff.

The second coupling member may include a food-squeezing unit, the food-squeezing unit is employed to squeeze the food inside the food-squeezing unit towards and into the food container.

The food-squeezing unit may include a squeezable container.

The food-squeezing unit may include a hollow barrel and a push member. The second opening is provided at one end of barrel and a third opening is provided at the other end of the barrel, and the push member is slidably movable inside the barrel.

The feeding apparatus may further include an intermediate member disposed between the second coupling member and the first coupling member for preventing the food inside the food container from moving back into the food-squeezing unit.

The intermediate member may include a casing with at least one blocking plate, the casing defines a central space in which the at least one blocking plate is mounted.

The intermediate member may include one blocking plate extending across a center of the casing.

The intermediate member may include two blocking plates formed into the shape of a cross.

The intermediate member may include three blocking plates formed into the shape of an asterisk.

BRIEF DESCRIPTION OF THE DRAWINGS

Specific embodiments of the feeding apparatus disclosed in the present application will now be described by way of example with reference to the accompanying drawings wherein:

FIG. 1 is an exploded view of a first embodiment of the feeding apparatus;

FIG. 2 is an exploded view of a second embodiment of the feeding apparatus;

FIG. 3 is an exploded view of a third embodiment of the feeding apparatus;

FIG. 4 is a perspective view of the third embodiment of the feeding apparatus;

FIG. 5 is a partially exploded view of a fourth embodiment of the feeding apparatus;

FIG. 6 is a perspective view of the fourth embodiment of the feeding apparatus;

FIG. 7 is a partially exploded view of a fifth embodiment of the feeding apparatus;

FIG. 7a is a top view of an annular projection provided on the feeding apparatus;

FIG. 7b is a cross sectional view taken along line X-X of the annular projection in FIG. 7a;

FIG. 8 is a perspective view of the fifth embodiment of the feeding apparatus;

FIG. 9 is a partially exploded view of a sixth embodiment of the feeding apparatus;

FIG. 10 is a perspective view of the sixth embodiment of the feeding apparatus;

FIG. 11 is a cross sectional view taken along line A-A of the feeding apparatus in FIG. 10;

FIG. 12 is a perspective view of the seventh embodiment of the feeding apparatus;

FIG. 13 is a perspective view of the eighth embodiment of the feeding apparatus;

FIG. 14 is a perspective view of the ninth embodiment of the feeding apparatus;

FIG. 15 is a perspective view of the tenth embodiment of the feeding apparatus;

FIG. 16a is a perspective view of a food container of the eleventh embodiment of the feeding apparatus;

FIG. 16b is a top plan view of a projection provided on the food container in FIG. 16a;

FIG. 16c is a cross sectional view taken along line Y-Y of the projection in FIG. 16b;

FIG. 17 is a partially exploded view of the twelfth embodiment of the feeding apparatus;

FIG. 18 is a perspective view of the thirteenth embodiment of the feeding apparatus;

FIG. 19 is an exploded view of the thirteenth embodiment of the feeding apparatus;

FIG. 20 is a perspective view of the fourteenth embodiment of the feeding apparatus;

FIG. 21 is an exploded view of the fourteenth embodiment of the feeding apparatus;

FIG. 22 is a perspective view of the fifteenth embodiment of the feeding apparatus;

FIG. 23 is an exploded view of the fifteenth embodiment of the feeding apparatus;

FIG. 24 is a perspective view of the sixteenth embodiment of the feeding apparatus;

FIG. 25 is a perspective view of the seventeenth embodiment of the feeding apparatus;

FIG. 26 is a perspective view of the intermediate member of the thirteenth embodiment of the feeding apparatus;

FIG. 27 is a perspective view of another intermediate member of the thirteenth embodiment of the feeding apparatus;

FIG. 28 is a perspective view of yet another intermediate member of the thirteenth embodiment of the feeding apparatus;

FIG. 29 is a side view of a first embodiment of the food-dispensing member of the feeding apparatus;

FIG. 30 is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 29;

FIG. 31 is a side view of a second embodiment of the food-dispensing member of the feeding apparatus;

FIG. 32 is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 31;

FIG. 33 is a side view of a third embodiment of the food-dispensing member of the feeding apparatus;

FIG. 34 is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 33;

FIG. 35 is a side view of a fourth embodiment of the food-dispensing member of the feeding apparatus;

FIG. 36 is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 35;

FIG. 37 is a side view of a fifth embodiment of the food-dispensing member of the feeding apparatus;

FIG. 38 is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 37;

FIG. 39 is a side view of a sixth embodiment of the food-dispensing member of the feeding apparatus;

FIG. 40 is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 39;

FIG. 41 is a perspective view of the eighteenth embodiment of the feeding apparatus;

FIG. 42 is an exploded view of the eighteenth embodiment of the feeding apparatus;

FIG. 43 is a side view of a seventh embodiment of the food-dispensing member of the feeding apparatus;

FIG. 44 is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 43;

FIG. 45 is a side view of an eighth embodiment of the food-dispensing member of the feeding apparatus;

FIG. 46 is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 47;

FIG. 47 is a side view of a ninth embodiment of the food-dispensing member of the feeding apparatus;

FIG. 48 is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 47;

FIG. 49 is a side view of a tenth embodiment of the food-dispensing member of the feeding apparatus;

FIG. 50 is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 49;

FIG. 51 is a side view of an eleventh embodiment of the food-dispensing member of the feeding apparatus;

FIG. 52 is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 51;

FIG. 53 is a side view of a twelfth embodiment of the food-dispensing member of the feeding apparatus;

FIG. 54 is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 53;

FIG. 55a is a top view of a thirteenth embodiment of the food-dispensing member of the feeding apparatus;

FIG. 55b is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 55a;

FIG. 55c is a front view of a thirteenth embodiment of the food-dispensing member of the feeding apparatus;

FIG. 56a is a top view of a fourteenth embodiment of the food-dispensing member of the feeding apparatus;

FIG. 56b is a cross sectional view taken along line A-A of the food-dispensing member of FIG. 55a; and

FIG. 56c is a front view of a fourteenth embodiment of the food-dispensing member of the feeding apparatus.

DETAILED DESCRIPTION

Reference will now be made in detail to a preferred embodiment of the feeding apparatus disclosed in the present application, examples of which are also provided in the following description. Exemplary embodiments of the feeding apparatus disclosed in the present application are described in detail, although it will be apparent to those skilled in the relevant art that some features that are not particularly important to an understanding of the feeding apparatus may not be shown for the sake of clarity.

Furthermore, it should be understood that the feeding apparatus disclosed in the present application is not limited to the precise embodiments described below and that various changes

and modifications thereof may be effected by one skilled in the art without departing from the spirit or scope of the appended claims. For example, elements and/or features of different illustrative embodiments may be combined with each other and/or substituted for each other within the scope of this disclosure and appended claims.

It should be noted that throughout the specification and claims herein, when one element is said to be "coupled" or "connected" to another, this does not necessarily mean that one element is fastened, secured, or otherwise attached to another element. Instead, the term "coupled" or "connected" means that one element is either connected directly or indirectly to another element, or is in mechanical or electrical communication with another element.

FIG. 1 is an exploded view of a first embodiment of the feeding apparatus. The apparatus includes a food container 7, a first coupling member 5, and a second coupling member 3. The food container 7 has an open end 71 and a closed end 72. The first coupling member 5 includes an opening 51. The food container 7 can be removably engaged with the first coupling member 5. When the food container 7 is coupled to the first coupling member 5, the open end 71 of the food container 7 is in communication with the opening 51 of the first coupling member 5. Food can be put into the food container 7 through the opening 51 of the first coupling member and the open end 71 of the food container 7. The second coupling member 3 can be cooperating with the first coupling member 5 and movable between an open configuration and a sealed configuration. In the open configuration, food can be put into the food container 7 through the opening 51 of the first coupling member 5 and the open end 71 of the food container 7. In the sealed configuration, the second coupling member 3 covers the opening 51 of the first coupling member 5 thereby sealing the open end 71 of the food container 7.

The food container 7 is provided with a plurality of apertures 8. According to the illustrated embodiment, the food container 7 has a plurality of apertures 8 arranged 360 degrees around the food container 7. The size and shape of the apertures 8 can be so designed that food coming out from the apertures 8 would not choke a person consuming the food. According to the illustrated embodiments, the apertures 8 are circular in shape and can have a diameter of about 1 mm to about 5 mm. The size, number and arrangement of the apertures 8 may vary according to different designs and requirements.

The food container 7 may be made of a soft resilient material suitable for use with foodstuff. This soft resilient material for foodstuff use may include silicone or latex, or rubber or polyvinyl chloride (PVC) for foodstuff use. Silicone material is non-toxic, environmental-friendly, wear resistant, resistant to high and low temperatures, and aging resistant. Products made of silicone are more environmental-friendly, more safe and more durable. It is appreciated that the food container 7 can be made of a transparent soft resilient material allowing a person to readily see through the food container 7 and know whether the container 7 is full or empty.

Normally, the food container 7 stays in its original shape and the food stays inside the food container 7. When the food container 7 is put inside a person' s mouth and a person chews, bites or sucks on the food container 7, the food container 7 collapses by the external force that forces the food (such as small pieces of crushed food, fruit puree, marc, juice, etc.) to seep and pass through the apertures 8. The food container 7 returns to its original shape upon release of the force due to the resiliency of the food container 7.

The food container 7 may be sized and shaped to hold small pieces of fruit or other food such as jelly, yogurt, vegetable, meat or fish, etc. The food container 7 can be put inside the mouth of a person for biting, sucking or chewing. For a fruit having juice and marc, fruit juice and small pieces of marc can be sucked through the apertures 8 and into a person's mouth, whilst larger pieces of marc remain inside the food container 7. Since the apertures 8 are smaller than the esophagus of a person eating the food, the person will not be choked by the food coming out from the apertures 8. This can protect the safety of the person eating food out of the feeding apparatus. For fruit having puree but without marc, the fruit puree can be dispensed through the apertures 8 and into the person's mouth. Therefore, one can use the feeding apparatus to feed an infant or baby with food such a fruit, and teach an infant or baby to chew and swallow without the risk of being choked by the fruit. The feeding apparatus is safe to an infant or baby and is convenient to use because it is not necessary for a caretaker to squeeze juice from the fruit before feeding. Using the feeding apparatus, an infant or baby can readily eat fresh fruit (such as strawberry, apple and pear), vegetable, fish, meat, etc.

When the food container 7 contains a mixture of food in solid state and liquid state, the liquid can form a sealing membrane over the apertures 8 under the influence of surface tension. Therefore, food inside the container 7 cannot be easily escaped through the apertures 8. An infant or baby needs to perform a suck action to suck the food through the apertures 8. This can train the muscles around the mouth as well as train the lung capacity of an infant or baby. Also, it can prevent leakage of liquid through the apertures 8 and spoilage of the clothing of the person eating the food out of the feeding apparatus. If the food container 7 is made of a mesh, the apertures on the mesh are not resilient and therefore it is difficult to form a sealing membrane over the apertures of the mesh. As the apertures on the mesh are close to each other, it becomes

more difficult to form a sealing membrane over the mesh's apertures. The distance between two apertures 8 in the present application can be about 2 mm to about 10 mm.

As shown in FIG. 1, the first coupling member 5 and the second coupling member 3 may be coupled together. For example, the first coupling member 5 may be provided with an annular recess and the second coupling member 3 may be provided with an annular projection. A sealing configuration can be formed when the annular projection is pressed into the annular recess. An open configuration can be formed when the annular projection is pulled out from the annular recess. Of course, the first coupling member 5 and the second coupling member 3 can be coupled together by other suitable coupling mechanism such as screw threads.

As shown in FIG. 2, the feeding apparatus may further be provided with a handle assembly 1 which is connected to the second coupling member 3. This facilitates the grasping of the feeding apparatus by a person eating the food. This can promote the training of the muscles of the hands of a person, especially for babies and patients, and can promote his or her hand, brain and mouth coordination. This feeding apparatus design can realize the food-eating initiative of an infant or baby.

The feeding apparatus may also include a cap 9 for covering the food container 7. The cap 9 serves to separate the food from the outer environment. The cap 9 can prevent any dust and dirt from contaminating the food while a person is not eating. The cap 9 may be removably attached to the first coupling member 5. As shown in the illustrated embodiment, the cap 9 can be attached to the first coupling member 5 by a simple snap-fitting mechanism. It is understood that the cap 9 may be attached to the first coupling member 5 by any other appropriate mechanism

such as screw threads. The closed end of the cap 9 may be provided with a plurality of supporting elements 91. The supporting elements 91 allow the cap 9 to steadily stand on a flat surface such as a desk. To fill the food container 7 with food, one can attach the cap 9 to the first coupling member 5, and then place the cap 9 on a desk in a stand-up position by the supporting elements 9. This facilitates the filling of the food container 7 with food even with one hand. The cap 9 may also be transparent and allow one to see the food inside the food container 7.

As illustrated in FIG. 2, the feeding apparatus may be provided with a rope-attaching element 10 by which a rope can be tied. The rope-attaching element 10 may be generally in the form of a ring integrally formed on the second coupling member 3. The rope-attaching element 10 may be made of a hard plastic material or any other suitable material. A rope can be tied or threaded through the rope-attaching element 10 so that the feeding apparatus can be hung around a person. This prevents the feeding apparatus from accidentally dropping on the ground and contaminating the food.

The food container 7 may be formed into the shape of a nipple of a milk-feeding bottle. It serves as a pacifier to comfort an infant or baby and induces the infant or baby to eat the food. The closed end of the food container 7 may be formed into a shape substantially conforming to the shape of the mouth of an infant or baby. This facilitates the infant in holding the food container 7 inside the mouth, and sucking fruit juice, puree or marc out of the food container 7 without choking.

According to the illustrated embodiment, the open end 71 of the food container 7, the outer surfaces of the first coupling member 5 and the second coupling member 3 are generally circular

in shape. This prevents the trapping of dirt on the feeding apparatus and facilitates cleaning of the feeding apparatus.

The feeding apparatus may also be provided with a fastening mechanism for fastening the first and second coupling members 5, 3 of the feeding apparatus in the sealed configuration. The fastening mechanism can strengthen the sealing between the first and second coupling members 5, 3, and prevent accidentally detaching the first coupling member 5 from the second coupling member 3 and therefore dropping the food.

According to the illustrated embodiment in FIGS. 3 and 4, the fastening mechanism may include a hinge 17 and a fastener 18. One side of the first and second coupling members 5, 3 can be hingedly connected to each other by the hinge 17. The other side of the first and second coupling members 5, 3 can be secured together by the fastening 18. One end 181 of the fastener 18 can be movably connected to the second coupling member 3. The other end 183 of the fastener 18 may include a fastening hole for frictional engagement with a corresponding fastening projection integrally formed on the first coupling member 5. It is contemplated that the hinge 17 and the fastener 18 are simple in construction, and can make opening and closing of the first and second coupling members 5, 3 easy.

According to another embodiment illustrated in FIGS. 5 and 6, the fastening mechanism may include two fasteners 18, 18. The two sides of the first and second coupling members 5, 3 can be secured together by the two fasteners 18, 18 respectively.

As depicted in FIGS. 7, 7a, 7b and 8, an annular protrusion 81 may be integrally formed on the

outer surface around of the first aperture 8. The protrusion 81 can be used to massage the gum, relief discomfort during teething, benefit the growth and development of gum and teeth of an infant or baby. The protrusions 81 can also strengthen the gum and enhance chewing capability. One can put an infant or baby' s favorite food inside the food container 7. Infant or baby would like to eat the food and have the gum massaged while eating the food. The feeding apparatus with protrusions 81 can therefore serve as a more effective teether compared to conventional tasteless teething apparatus.

The feed apparatus of the present application may include one handle assembly or two handle assemblies. As shown in FIGS. 9 and 10, the handle assembly 1 of the feeding apparatus may include a handle core 13, a handle pad 14 and a handle sleeve 11. The handle core 13 can be attached to the second coupling member 3. The handle pad 14 can be fixed on the handle core 13 to provide anti-slip and appealing effects. According to the illustrated embodiment, two handle pads 14 are attached to the front and the back of the handle core 13 respectively. Alternatively, the two handle pads 14 may be attached to the left side and the right side of the handle core 13 respectively. The handle sleeve 11 can be wrapped around the handle pad 14. The handle assembly 1 may further include a plurality of anti-slip strips 12. The strips 12 may be secured onto the handle pads 14 to further provide anti-slip and appealing effects. It is understood that the number of strips 12 on a handle pad 14 may vary depending on the different designs. The handle sleeve 11 and the strips 12 may be made of soft rubber or any other suitable material, which can facilitate the gripping of the handle assembly 1 and produce a comfort feeling to a person holding the handle assembly 1. The handle core 13 and the handle pad 14 may be made of hard plastic or any other suitable material.

As shown in FIGS. 9-11, the second coupling member 3 may include an outer ring 33 and a cover 31 covering the top of the outer ring 33. The outer ring 33 and the cover 31 may be coupled together by relative rotation of a projection and recess mechanism. For example, the projection and recess mechanism may include an annular groove and an annular projection formed on the outer ring 33 and the cover 31 respectively. The outer ring 33 and the cover 31 may also be coupled together by screw threads. Alternatively, the outer ring 33 and the cover 31 may be integrally formed as one single piece. Two handle cores 13 may be attached to the two sides of the cover 31 respectively. Furthermore, the cap 9 can be coupled to the outer ring 33.

As shown in the embodiment in FIGS. 3 and 5, a radially outwardly extending annular flange 73 is provided at the open end 71 of the food container 7. In the sealed configuration, the annular flange 73 rests on a radially inwardly extending annular shoulder or platform 54 of the first coupling member 5, and can be clamped between the annular platform 54 and the second coupling member 3. In the open configuration, the annular flange 73 can be removed from the annular platform 54 of the first coupling member 5. This can make the assembling and cleaning of the feeding apparatus simple and easy. Since the food container 7 is made of a soft resilient material, the soft resilient annular flange 73 can have a sealing function and can strengthen the sealing between the first and the second coupling members 5, 3. This can further prevent the spilling of food while a person, especially a baby, is playing with the feeding apparatus while eating.

As shown in FIG. 12, the open end 71 of the food container 7 and the first coupling member 5 can be generally triangular in shape. Each of the three acute angles can be rounded. As shown in FIG. 13, the open end 71 of the food container 7 and the first coupling member 5 can be

generally rectangular in shape. Each of the angles can be rounded. These two feeding apparatus designs do not have unhygienic dead corners that would cause hygiene problem and are therefore easy to clean.

As depicted in FIGS. 14 and 15, the position of the annular flange 73 and the annular platform 54 can be fixed by position-fixing mechanism thereby allowing a person to hold the handle by a hand in a horizontal position while the food container 7 is in the mouth. This allows the person to hold the handle comfortably while eating. According to the illustrated embodiment, the position-fixing mechanism may include a notch 75 provided on the annular flange 73 and a corresponding projection 58 provided on the annular platform 54. Of course, it is appreciated that a notch can be formed on the annular platform 54 and a corresponding projection can be formed on the annular flange 73 instead.

Although it has been shown and described that the annular protrusions 81 are formed around the apertures 8, it is understood by one skilled in the art that further protrusions can be formed elsewhere on the outer surface of the food container 7.

FIG. 16 shows a food container 7 having a plurality of apertures 8 formed around the food container 7 and a plurality of protrusions 81 integrally formed at the closed end of the food container 7. The apertures 8 are used for dispensing food and the protrusions 81 are used for massaging the gum of a baby or infant. According to the illustrated embodiment as shown in FIGS. 16b and 16c, the protrusions 81 are in the shape of a semi-circle. It is understood that the shape, size, and arrangement of these protrusions 81 on the food container 7 may vary depending on different designs.

Although it has been shown and described that the apertures 8 are circular in shape, it is understood that the apertures 8 may in any other appropriate shapes.

As shown in FIGS. 17-21, the feeding apparatus may include a food container 7, a first coupling member 5, and a second coupling member 3. The food container 7 has an open end 71 and a closed end 72. The first coupling member 5 includes an opening 51. The food container 7 can be detachably coupled to the first coupling member 5. When the food container 7 is coupled to the first coupling member 5, the open end 71 of the food container 7 is in communication with the opening 51 of the first coupling member 5. Food can be put into the food container 7 through the opening 51 of the first coupling member 5 and the open end 71 of the food container 7. The second coupling member 3 can be cooperating with the first coupling member 5 and movable between an open configuration and a sealed configuration. In the open configuration, food can be put into the food container 7 through the opening 51 of the first coupling member 5 and the open end 71 of the food container 7. In the sealed configuration, the second coupling member 3 covers the opening 51 of the first coupling member 5 thereby sealing the open end 71 of the food container 7.

The food container 7 is provided with a plurality of apertures 8. According to the illustrated embodiment, the food container 7 has a plurality of apertures 8 arranged around the food container 7.

The second coupling member 3 may include a body 36 and a food-squeezing unit 35. The body 36 can be coupled to the first coupling member 5. The body 36 defines a passage 361. The food-

squeezing unit 35 may be mounted to the body 36. The food-squeezing unit 35 has a second opening 351 at one end thereof. The food-squeezing unit 35 is employed to squeeze the food therein towards and into the food container 7 through the second opening 351, the passage 361 on the body 36, the opening 51 of the first coupling member 5, and the open end 71 of the food container 7.

Since the second coupling member 3 can be separated into body 36 and food-squeezing unit 35, one can manufacture a larger food-squeezing unit 35. When the food in the food container 7 is consumed, the user (including a parent or an infant) can squeeze the food out of the food-squeezing unit 35 and towards and into the food container 7, and continue the feeding process. This facilitates outdoor feeding and enhances the joy of food taking.

The food-squeezing unit 35 may be in the form of a squeezable container for squeezing out the food therefrom when the external surface of the food-squeezing unit 35 is pressed. When the food-squeezing unit 35 is pressed, the food inside passes through the second opening 351 of the food-squeezing unit 35, the passage 361 of the body 36, the opening 51 of the first coupling member 5, the open end 71 of the food container 7 and into the food container 7. The food-squeezing unit 35 may be made of a resilient material for use with foodstuff. The resilient material may comprise silicone, latex or rubber for use with foodstuff.

One side of the body 36 can be connected to the first coupling member 5 by a hinge 17, and the other side of the body 36 can be detachably connected to the first coupling member 5 by fastener 18. The open end 71 of the food container 7, the first coupling member 5, the body 36 of the second coupling member 3, the second opening 351 of the food-squeezing unit 35 can have a

circular outer configuration so that the feeding apparatus is easy to clean because it has no unhygienic dead corners.

As illustrated in FIGS. 19 and 21, the feeding apparatus may include an intermediate member 6 located between the body 36 and the first coupling member 5. The intermediate member 6 is employed to prevent the food inside the food container 7 from moving back into the food-squeezing unit 35. According to the embodiments illustrated in FIG. 26, the intermediate member 6 may include a casing 61 and two blocking plates 63. The casing 61 defines a central space in which the two blocking plates 63 are formed into the shape of a cross. The two blocking plates 63 serve to block the food inside the food container 7 thereby preventing the food from moving back into the food-squeezing unit 35. However, it is contemplated that when the food-squeezing unit 35 is pressed, the pressure inside the food-squeezing unit 35 increases and forces the food inside the food-squeezing unit 35 to move towards and into the food container 7.

It is understood that the number of blocking plates 63 may vary according to the requirements. For example, in FIG. 27, there is only one blocking plate 63 extending across a center of the casing 61. As illustrated in FIG. 28, there are three blocking plates 63 formed into the shape of an asterisk.

As depicted in a further embodiment in FIG. 20, one side of the body 36 is connected to the first coupling member 5 by one fastener 18, and the other side of the body 36 is detachably connected to the first coupling member 5 by another fastener 18.

According to the illustrated embodiments in FIGS. 17-21, the feeding apparatus may include a

position-fixing mechanism. The position of the annular flange 73 of the food container 7 relative to the annular platform 54 of the first coupling member 5 can be fixed by the position-fixing mechanism. This allows a person to hold the food-squeezing unit 35 in a horizontal position while the food container 7 is in the mouth. This allows the person to hold the handle comfortably while eating. The position-fixing mechanism may include a notch 75 provided on the annular flange 73 and a corresponding projection 58 provided on the annular platform 54. Of course, it is appreciated that a notch can be formed on the annular platform 54 and a corresponding projection can be formed on the annular flange 73 instead.

As depicted in another embodiment in FIGS. 22 and 23, the food-squeezing unit may include a barrel 37 and a push member 38. The barrel 37 is hollow and has a second opening 371 at one end and a third opening 372 at the other end. The push member 38 is slidably movable inside the barrel 37. The barrel 37 may be connected to the body 36. The food can be placed in the barrel 37. The push member 38 can be pushed towards the food container 7 with great pressure thereby forcing the food inside the barrel to move towards the food container 7. It can be seen that the open end 71 of the food container 7, the first coupling member 5, the body 36 of the second coupling member 3, the second opening 371 and the third opening 372 of the barrel 37, and the push member 38 have circular outer configuration. The feeding apparatus shown in FIGS. 22 and 23 may also include the intermediate member 6.

As shown in FIG. 24, the open end 71 of the food container 7, the first coupling member 5, the body 36 of the first and second coupling members, the second opening 351 of the food-squeezing unit 35 can have a generally triangular outer configuration. The three acute angles of the triangular outer configuration can be rounded. As shown in FIG. 25, the open end 71 of the food

container 7, the first coupling member 5, the body 36 of the first and second coupling members, the second opening 351 of the food-squeezing unit 35 can have a generally rectangular outer configuration. The four angles of the rectangular outer configuration can be rounded. These two feeding apparatus designs do not have unhygienic dead corners that would cause hygiene problem and are easy to clean.

According to the requirements, the protrusions 81 can be located at any positions on the outer surface of the food container 7. As shown in FIG. 16, the protrusions 81 are formed at a lower portion of the closed end of the food container 7. The protrusions 81 may also be formed between adjacent apertures 8. The above-mentioned embodiment applies to food container 7 with protrusions 81 at different locations.

The intermediate member 6 is not a necessary feature of the feeding apparatus disclosed in the present application. According to the requirements, the intermediate member 6 may or may not be provided on the feeding apparatus. Also, the position-fixing mechanism is not a necessary feature of the feeding apparatus. According to the requirements, the position-fixing mechanism may or may not be provided on the feeding apparatus. There may be three kinds of food container 7 that can be provided on a feeding apparatus, namely (i) food container 7 without protrusions; (ii) food container 7 with protrusions formed on the outer surface; and (iii) food container 7 with protrusions formed between adjacent first apertures.

As shown in FIGS. 41 and 42, the feeding apparatus may include a food container 7, a first coupling member 5, and a second coupling member 3. The food container 7 has an open end 71 and a closed end 72. The first coupling member 5 includes an opening 51. The food container 7

can be detachably coupled to the first coupling member 5. When the food container 7 is coupled to the first coupling member 5, the open end 71 of the food container 7 is in communication with the opening 51 of the first coupling member 5. The second coupling member 3 can be cooperating with the first coupling member 5 and movable between an open configuration and a sealed configuration. The food container 7 may be provided with a plurality of apertures 8. The second coupling member 3 may be in the form of a milk bottle.

In FIGS. 41 and 42, the milk bottle may be threadably connected to the first coupling member 5. When the milk bottle is screwed onto the first coupling member 5, a sealed configuration can be formed between them. When the milk bottle is unscrewed from the first coupling member 5, an open configuration is formed. It is understood that the milk bottle and the first coupling member 5 can be connected together by other appropriate mechanism such as fasteners. A user can place the food (such as syrup, rice cereal, porridge, etc.) into the milk bottle and feed a baby or infant with the food container 7.

A radially outwardly extending annular flange 73 is provided at the open end 71 of the food container 7. In the sealed configuration, the annular flange 73 rests on a radially inwardly extending annular shoulder or platform 54 of the first coupling member 5, and can be clamped between the annular platform 54 and the second coupling member 3. In the open configuration, the annular flange 73 can be removed from the annular platform 54 of the first coupling member 5.

The food container 7 may be made of resilient material. The outer and/or the inner surface of the food container 7 may be provided with protrusions 81. The protrusions 81 may be formed around

the first apertures. The protrusions may be formed between two adjacent first apertures. The apertures 8 may be circular in shape with a diameter of about 1 mm to 5 mm. There may be at least two apertures 8. The dimension of the first aperture closer to the closed end may be smaller than the dimension of the first aperture farther from the closed end. The distance between two apertures 8 is about 2 mm to about 10 mm.

The food-dispensing member of the feeding apparatus (which is the food container in the above embodiments) will now be described in detail. As shown in FIGS. 29-40, the food-dispensing member of a feeding apparatus includes a food container 7 made of a resilient material for use with foodstuff. The food container 7 may include an open end 71 and a closed end 72. The surface of the food container 7 may be provided with apertures 8 and protrusions 81.

The protrusions 81 can be used to massage the gum, relief discomfort during teething, benefit the growth and development of gum and teeth of an infant or baby. The protrusions 81 can also strengthen the gum and enhance chewing capability. During the feeding process, the saliva of the infant or baby can enter the food container 7 through the apertures 8 thereby (digesting) the food to promote feeding and digestion. One can put an infant or baby's favorite food inside the food container 7. Infant or baby would like to eat the food and have the gum massaged while eating the food. The feeding apparatus with protrusions 81 can therefore serve as a more effective teether compared to conventional tasteless teething apparatus.

The food-dispensing member in the present application can be formed into a chewing container that can fully provide the necessary condition and environment (saliva, etc.) for chewing activities. Babies are able to actively eat the food thereby leading to early development of their

brains. Since the food container 7 is made of a resilient material, it can maintain its original shape and softness thereby maintaining its original food-carrying space and providing a chewing space that would benefit the chewing of the food inside the food container. The existing food-dispensing member of feeding apparatus (such as a mesh) can only make a baby swallow passively. It cannot make a baby actively eat the food or even induce a baby to chew.

The shape of the apertures 8 may vary according to the need. For example, the apertures 8 may have the shape of a circle, square or triangle, etc. The dimension of the apertures 8 may vary according to the need so as to control the amount and rate of the flow of the food. When the first aperture 8 is circular in shape, its diameter may be about 1 mm to about 5 mm.

The number of apertures 8 can be adjusted depending on the need and the rate of food consumption. A food container 7 usually has at least two first apertures. For example, the food container 7 may have 10 apertures or 20 first apertures. At the same time, the distance between the apertures 8 can be adjusted depending on the need and the rate of food consumption. Usually, the distance between two apertures 8 is about 2 mm to about 10 mm. For example, the distance between two apertures 8 can be 2 mm, 4 mm, 6 mm or 10 mm.

The thickness of the food container 7 can be adjusted according to the need of the chewing force of a baby or infant. For example, the thickness of the food container can be about 1 mm to about 6 mm. This is quite suitable for babies that are learning to eat.

As shown in FIGS. 29-40, the food container 7 may be in the shape of a nipple of a conventional milk bottle, or a flattened nipple of a milk bottle. The food container 7 may tapers into a rounded

end. The shape of the food container 7 may generally conform to the shape of the mouth of an infant. These food container designs can facilitate baby feeding and induce baby's food taking. It is understood that the food container 7 may be in other shapes in order to meet other requirements.

The food container 7 may be made of durable material such that it can be repeatedly used. The food container 7 may be made of colored material such that it can attract the curiosity of babies and infants and induce them to consume the food. The food container 7 may be made of transparent material allowing a person to readily see through the food container 7 and know whether the container 7 is full or empty.

The food container 7 may be made of a soft resilient material suitable for use with foodstuff. This soft resilient material for foodstuff use may include silicone or latex, or rubber or polyvinyl chloride (PVC) for foodstuff use. Silicone material is non-toxic, environmental-friendly, wear resistant, resistant to high and low temperatures, and aging resistant. Products made of silicone are more environmental-friendly, more safe and more durable.

The protrusions 81 can be formed at any location of the food container 7 so long as babies and infants can touch and feel them during feeding. For example, in FIGS. 34 and 36, the protrusions 81 are formed on the outer surface of the food container 7. As shown in FIGS. 30 and 38, the protrusions 81 are formed on the inner surface of the food container 7. Since the food container 7 is made of a relatively soft resilient material, babies and infants can feel them and use them to massage the gum even though they are formed on the inner surface of the food container 7. When babies and infants bite the food container 7 such that the opposite sides of the food

container 7 are in touch with each other, the feeling of the protrusions 81 is even stronger. When the protrusions 81 are formed on the inner surface of the food containers, babies and infants can feel that the protrusions 81 are softer and that that it is more comfortable during gum massaging.

As shown in FIGS. 32 and 40, the protrusions 81 can be formed on both the outer and inner surfaces of the food container. As shown in FIGS. 29-40, the protrusions 81 can be formed around the apertures 8. As shown in FIGS. 43-46 and 51-54, the protrusions 81 can be formed between adjacent apertures 8. As shown in FIGS. 43, 44, 51 and 52, the protrusions 81 can be formed on the outer surface of the food container 7 between adjacent apertures 8. As shown in FIGS. 45, 46, 53, 54, the protrusions can be formed on the inner surface of the food container 7 between adjacent apertures 8. As shown in FIG. 16, the protrusions 81 can be formed at a lower portion of the closed end 72 of the food container 7.

The dimension of the apertures 8 may vary. For example, the dimension of the apertures closer to the closed end is smaller than the dimension of the apertures farther from the closed end. For example, when the apertures are circular in shape, the apertures closer to the closed end may have a diameter of 1 mm and the apertures farther to the closed end may have a diameter larger than 1 mm. This can prevent the liquid inside the food container 7 from leaking out so as to facilitate the placing of food with juice inside the food container 7.

The dimension of the food container 7 can be adjusted according to the need. In one embodiment, for example, the thickness of the food container 7 can be about 1.2 mm. The annular flange 73 at the open end 71 may have an inner diameter of 20.6 mm and an outer diameter of 33.5 mm. The annular flange 73 may have a thickness of 2 mm. The notch 75 on the annular flange 73 may

have a width of 3 mm. The distance between the two opposite notches 75 can be 27.25 mm. The food container 7 may have a height of 38.75 mm and a width of 32.96 mm. The diameter of the apertures 8 is 2 mm. As shown in the embodiment in FIGS. 55a, 55b, and 55c, the thickness of the food container 7 is 1.2 mm. The annular flange 73 at the open end 71 may have an inner diameter of 20.6 mm and an outer diameter of 33.5 mm. The annular flange 73 may have a thickness of 2 mm. The notch 75 on the annular flange 73 may have a width of 3 mm. The distance between the two opposite notches 75 can be 27.25 mm. The food container 7 may have a height of 38.75 mm and a width of 32.96 mm. The diameter of the apertures 8 is 2 mm. As shown in the embodiment in FIGS. 56a, 56b, and 56c, the thickness of the food container 7 is 1.35 mm. The annular flange 73 at the open end 71 may have an inner diameter of 20.3 mm and an outer diameter of 33.5 mm. The annular flange 73 may have a thickness of 2 mm. The notch 75 on the annular flange 73 may have a width of 3 mm. The distance between the two opposite notches 75 can be 27.25 mm. The food container 7 may have a height of 38.75 mm and a width of 23 mm. The diameter of the apertures 8 is 1.5 mm.

The feeding apparatus of the present application can facilitate the feeding of food by the food container. The rate of flowing of the food can be controlled by the apertures so that it is not easy for the food to leak out from the food container. Comparing to conventional feeding apparatus, the feeding apparatus of the present application is more clean, hygienic and easy to use. Other utensils such as fork, knife and spoon are not required for feeding. The feeding apparatus can be used not only by babies and infants but also by handicapped people, elderly people and people having illness. The feeding apparatus of the present application can even be used in weightless space environment. Food can stay in the food container and ensure cleanliness during food taking.

It is understood by one skilled in the art that different food containers can be used in cooperation with different feeding apparatuses

While the feeding apparatus disclosed in the present application has been shown and described with particular references to a number of preferred embodiments thereof, it should be noted that various other changes or modifications may be made without departing from the scope of the appending claims.

2010276032 28 May 2014

What is claimed is:

1. A feeding apparatus comprising:

a food container, the food container comprising an open end and a closed end, the food container being provided on a surface thereof with a plurality of apertures, the food container being made of a resilient material for use with foodstuff; a first coupling member comprising a platform, and an opening in communication with the container open end, the food container being engaged with the first coupling member; and

a second coupling member cooperating with the first coupling member and movable between an open configuration allowing food to pass through the opening and into the food container, and a sealed configuration where the second coupling member covers the opening of the first coupling member thereby sealing the open end of the food container, the second coupling member comprising a first protruding plug portion which snugly plugs into and seals the opening of the first coupling member when the second coupling member is in the sealed configuration;

wherein the open end of the food container comprises an annular flange which is adapted to be clamped between the platform of the first coupling member and the first protruding plug portion of the second coupling member, a bottom surface of the first protruding plug portion is pressed against a top surface of the flange of the food container, and a bottom surface of the flange of the food container is pressed against the platform of the first coupling member when the second coupling member is in the sealed configuration.

2. The feeding apparatus as claimed in claim 1, wherein the food container further comprises a plurality of protrusions, the protrusions are formed on an outer surface and/or an inner surface of the food container.

3. The feeding apparatus as claimed in claim 1, wherein the food container further comprises a plurality of protrusions, the apertures are circular in shape with a diameter of about 1 mm to about 5 mm.

4. The feeding apparatus as claimed in claim 1, wherein the food container comprises a plurality of apertures closer to the closed end and a plurality of apertures farther from the closed end, and wherein the dimension of the apertures closer to the closed end is smaller than the dimension of the apertures farther from the closed end.

5. The feeding apparatus as claimed in claim 1, wherein the distance between two adjacent apertures is about 2 mm to about 10 mm.

6. The feeding apparatus as claimed in claim 1, wherein the food container further comprise a plurality of protrusions, the protrusions are formed between two adjacent apertures.

7. The feeding apparatus as claimed in claim 1, wherein the resilient material for use with foodstuff is selected from the group consisting of silicone, latex, and rubber.

8. The feeding apparatus as claimed in claim 1, wherein the food container is generally in the shape of a nipple of a milk-feeding bottle.

9. The feeding apparatus as claimed in claim 1, wherein the shape of the food container is generally cylindrical with a rounded head and being suitable for putting into infant's mouth.

10. The feeding apparatus as claimed in claim 1, wherein the food container tapers into a rounded end.

11. The feeding apparatus as claimed in claim 1, wherein the thickness of the food container is about 1 mm to about 6 mm.

12. The feeding apparatus as claimed in claim 1, wherein a notch is provided at one of the annular flange of the food container and the first coupling member, and a projection is provided at the other of the annular flange of the food container and the first coupling member, the notch and projection being interengagable to prevent or limit relative angular displacement of the food container and the first coupling member when the annular flange is clamped between the annular platform of the first coupling member and the second coupling member.

13. The feeding apparatus as claimed in claim 12, wherein the second coupling member comprises a food-squeezing unit, the food-squeezing unit is employed to squeeze the food inside the food-squeezing unit towards and into the food container.

14. The feeding apparatus as claimed in claim 13, wherein the food-squeezing unit comprises a squeezable container.

15. The feeding apparatus as claimed in claim 13, wherein the food-squeezing unit comprises a hollow barrel and a push member, the second opening is provided at one end of barrel and a third opening is provided at the other end of the barrel, and the push member is slidably movable inside the barrel.

16. The feeding apparatus as claimed in claim 13, further comprising an intermediate member disposed between the second coupling member and the first coupling member for preventing the food inside the food container from moving back into the food-squeezing unit.

17. The feeding apparatus as claimed in claim 16, wherein the intermediate member comprises a casing with at least one blocking plate, the casing defines a central space in which the at least one blocking plate is mounted.

18. The feeding apparatus as claimed in claim 17, wherein the intermediate member comprises one blocking plate extending across a center of the casing.

19. The feeding apparatus as claimed in claim 17, wherein the intermediate member comprises two blocking plates formed into the shape of a cross.

20. The feeding apparatus as claimed in claim 17, wherein the intermediate member comprises three blocking plates formed into the shape of an asterisk.

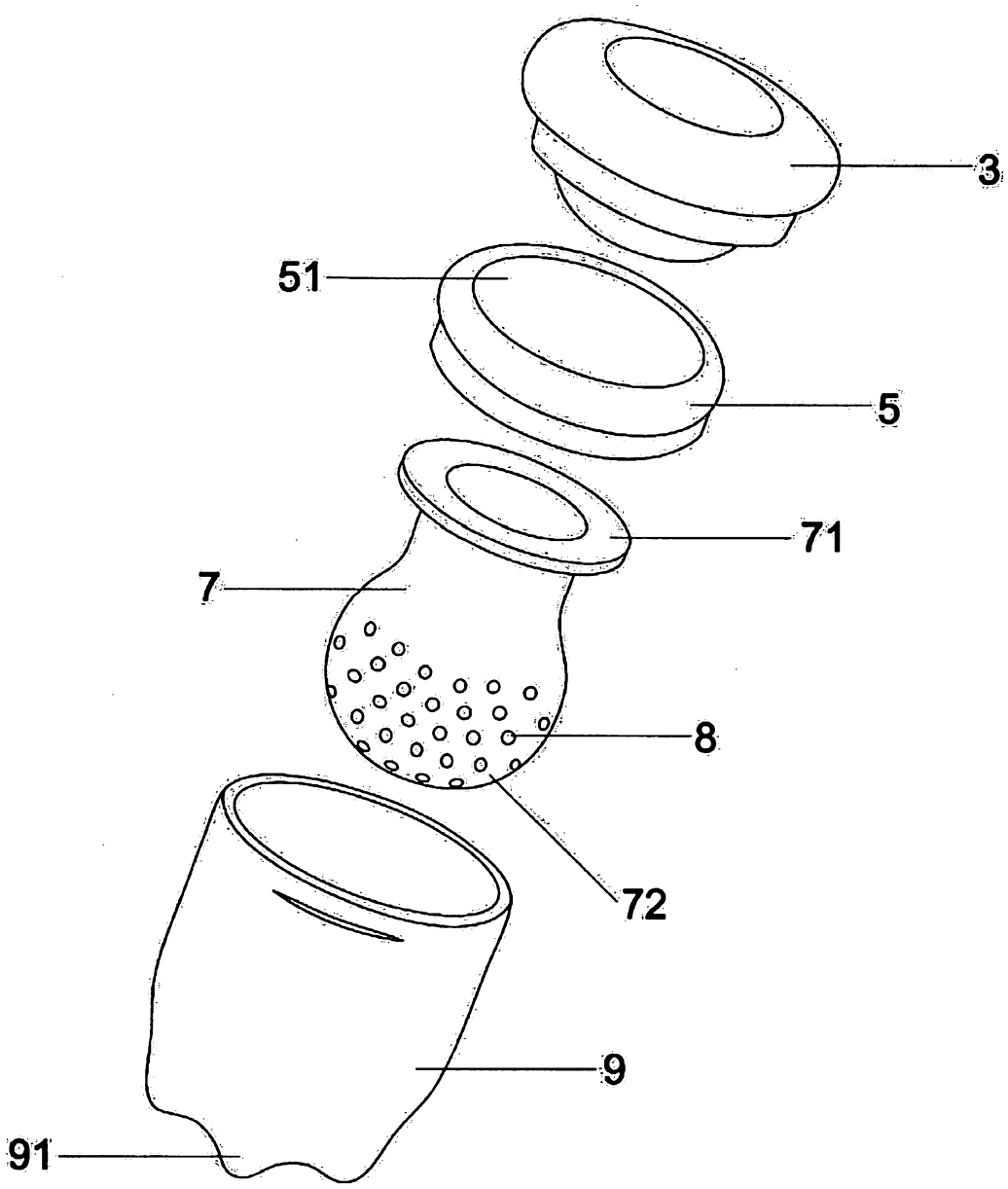

FIG. 1

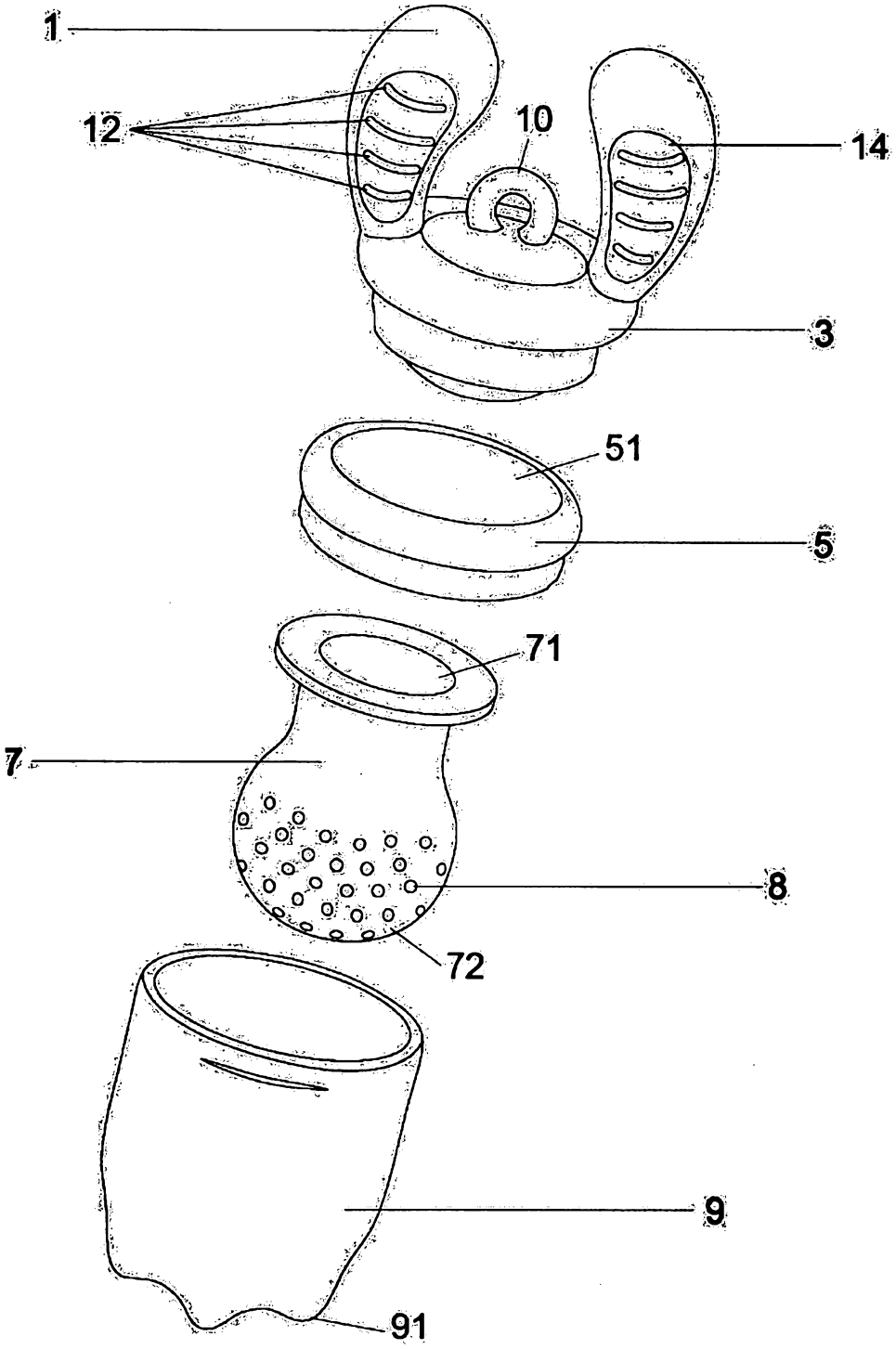

FIG. 2

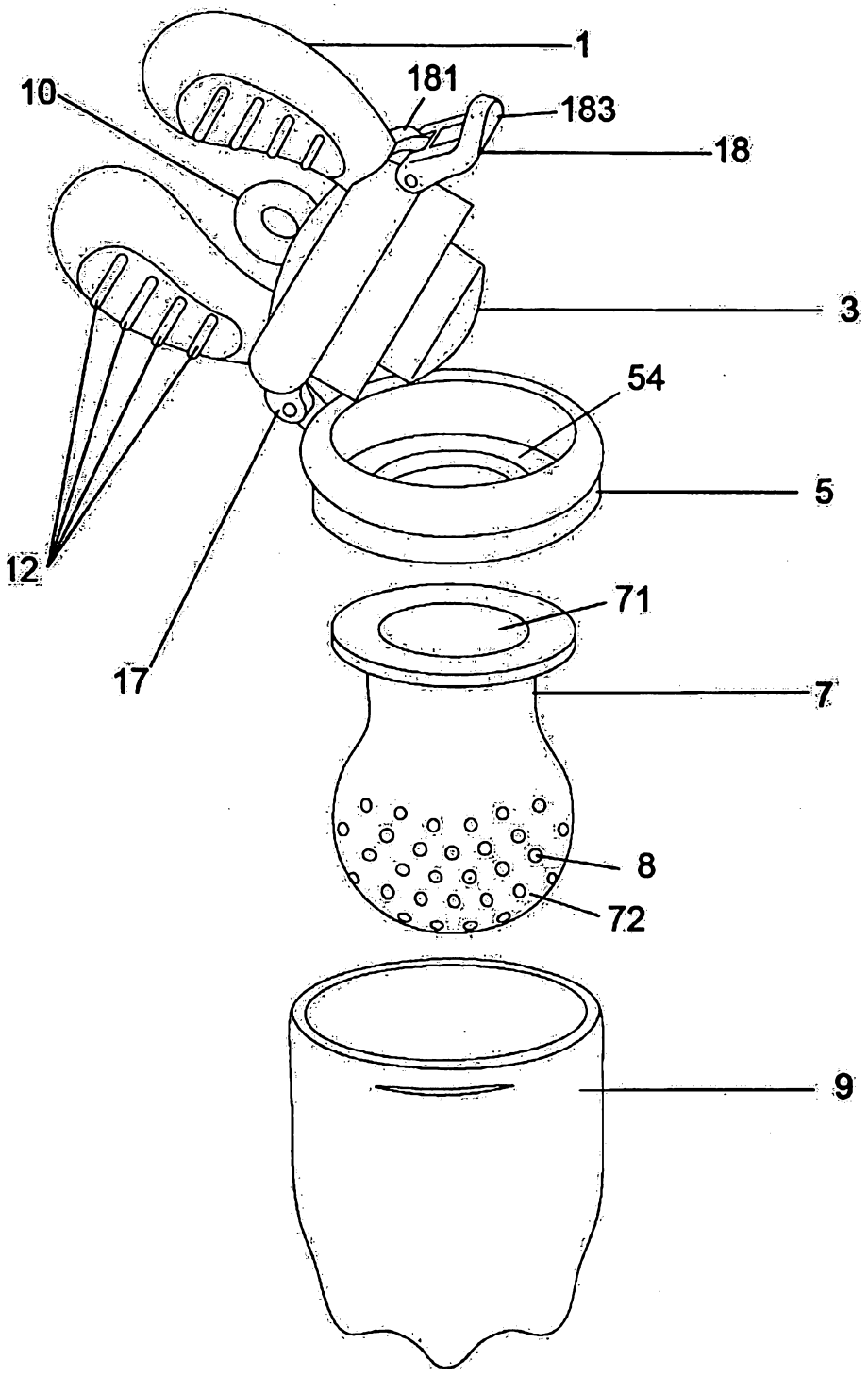

FIG. 3

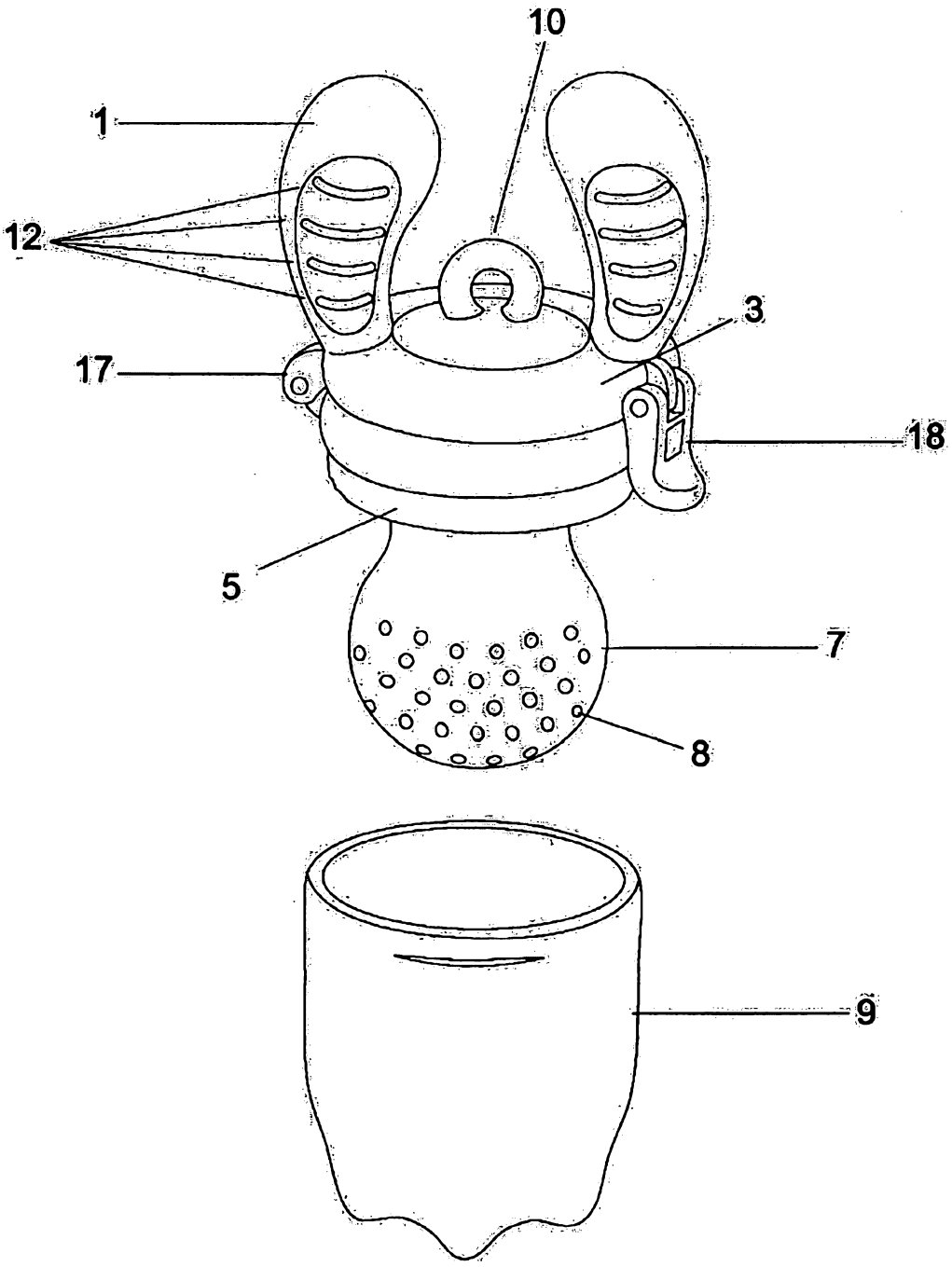

FIG. 4

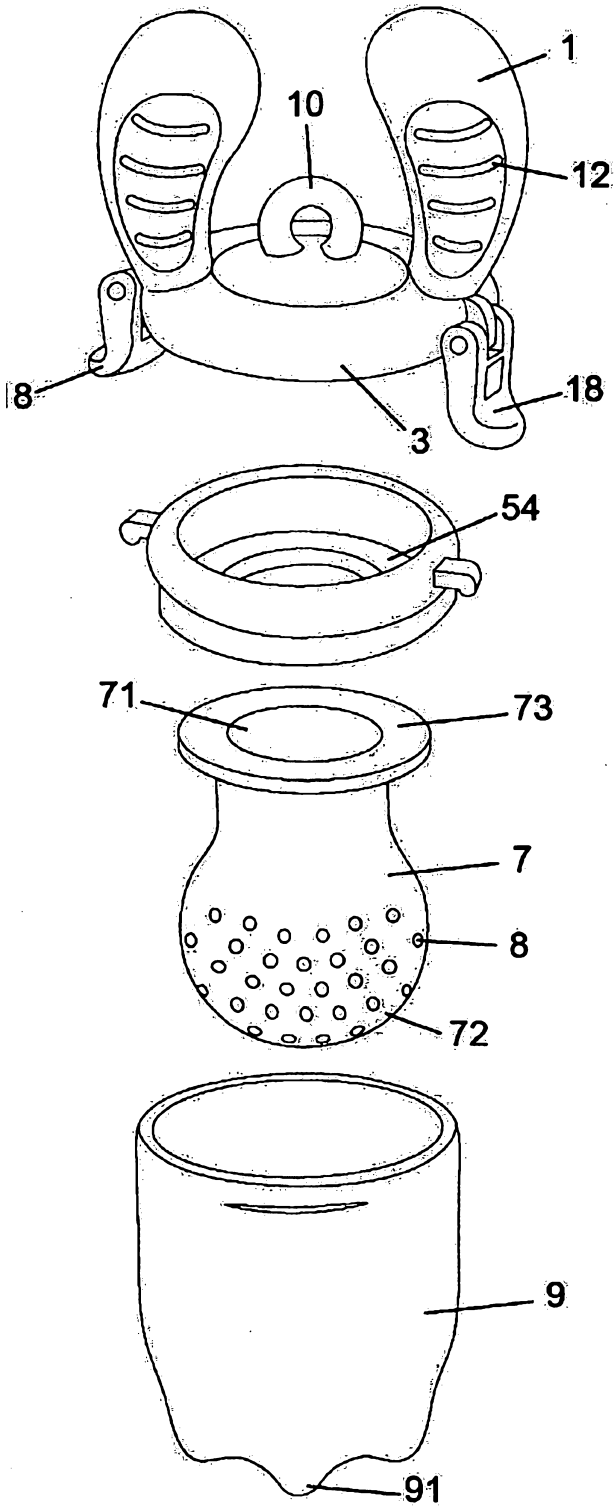

FIG. 5

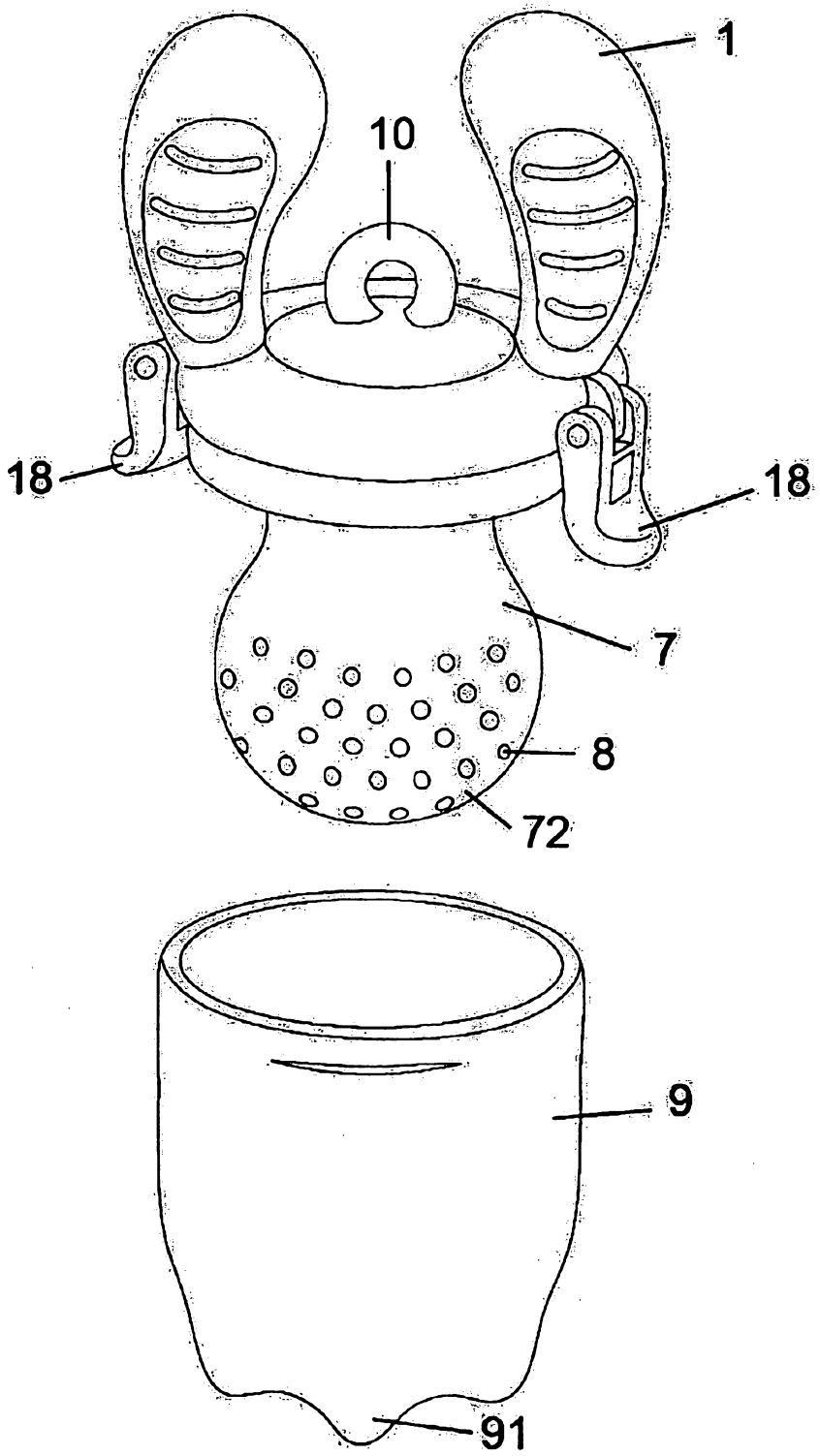

FIG. 6

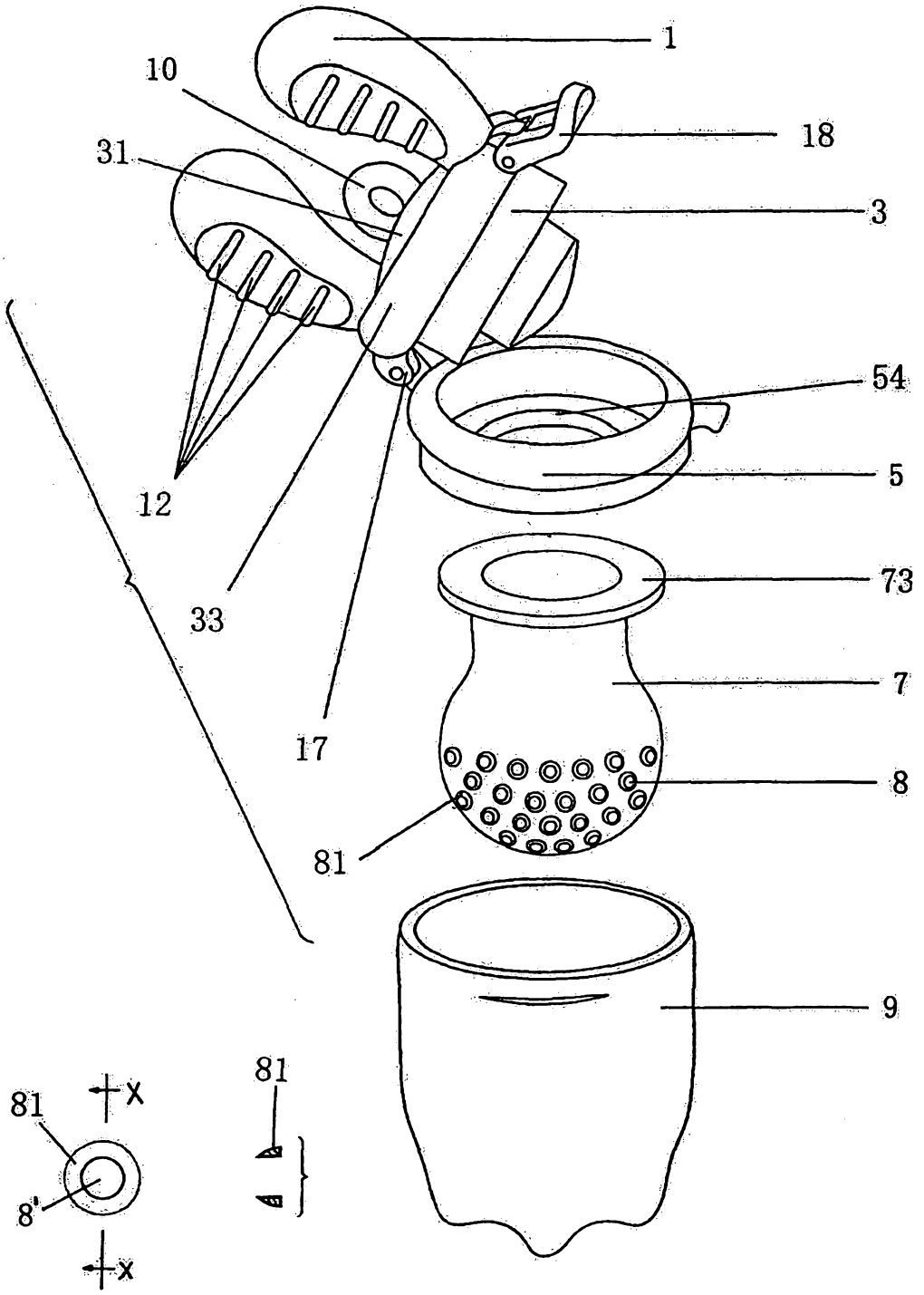

FIG. 7b

FIG. 7a

FIG. 7

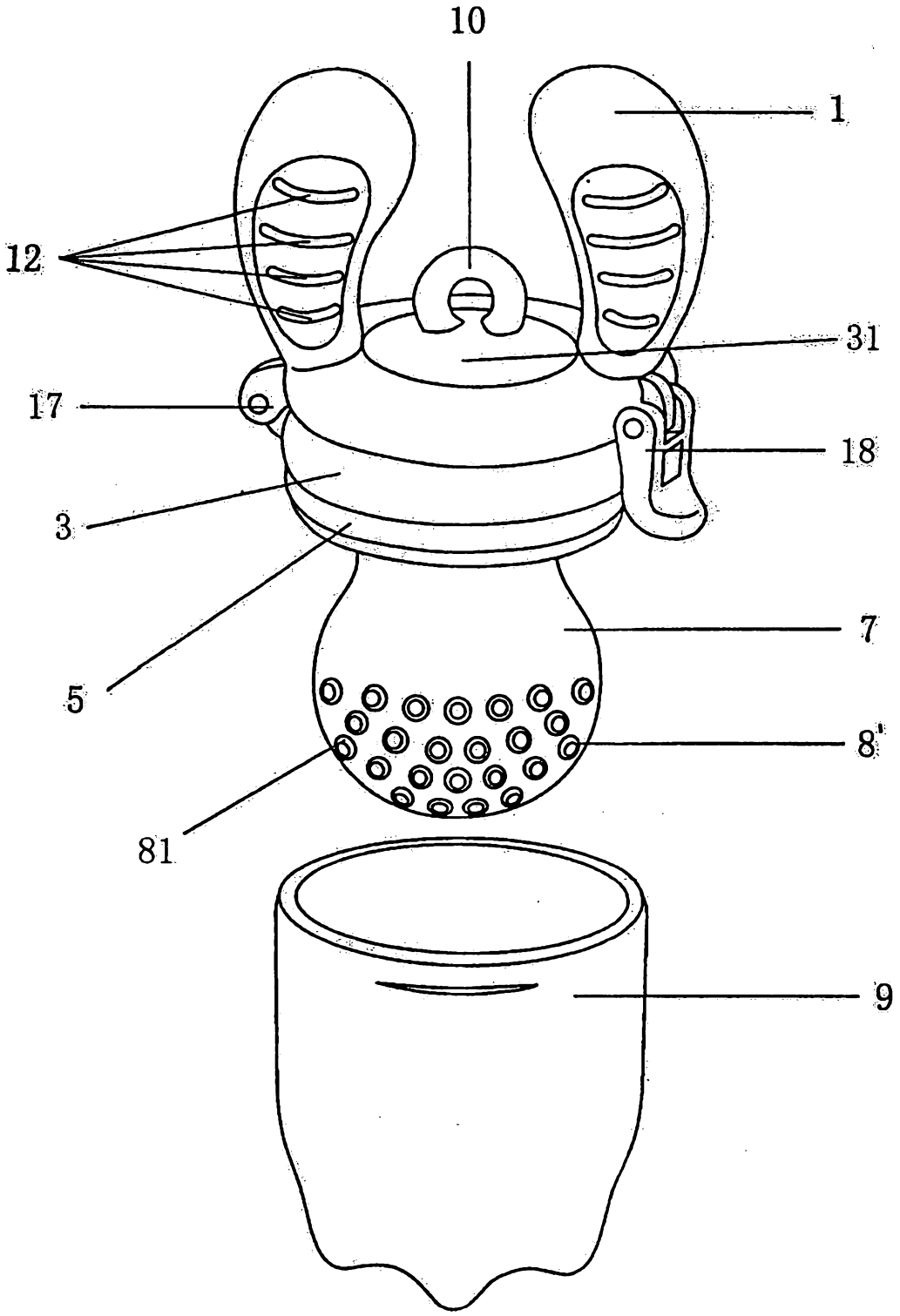

FIG. 8

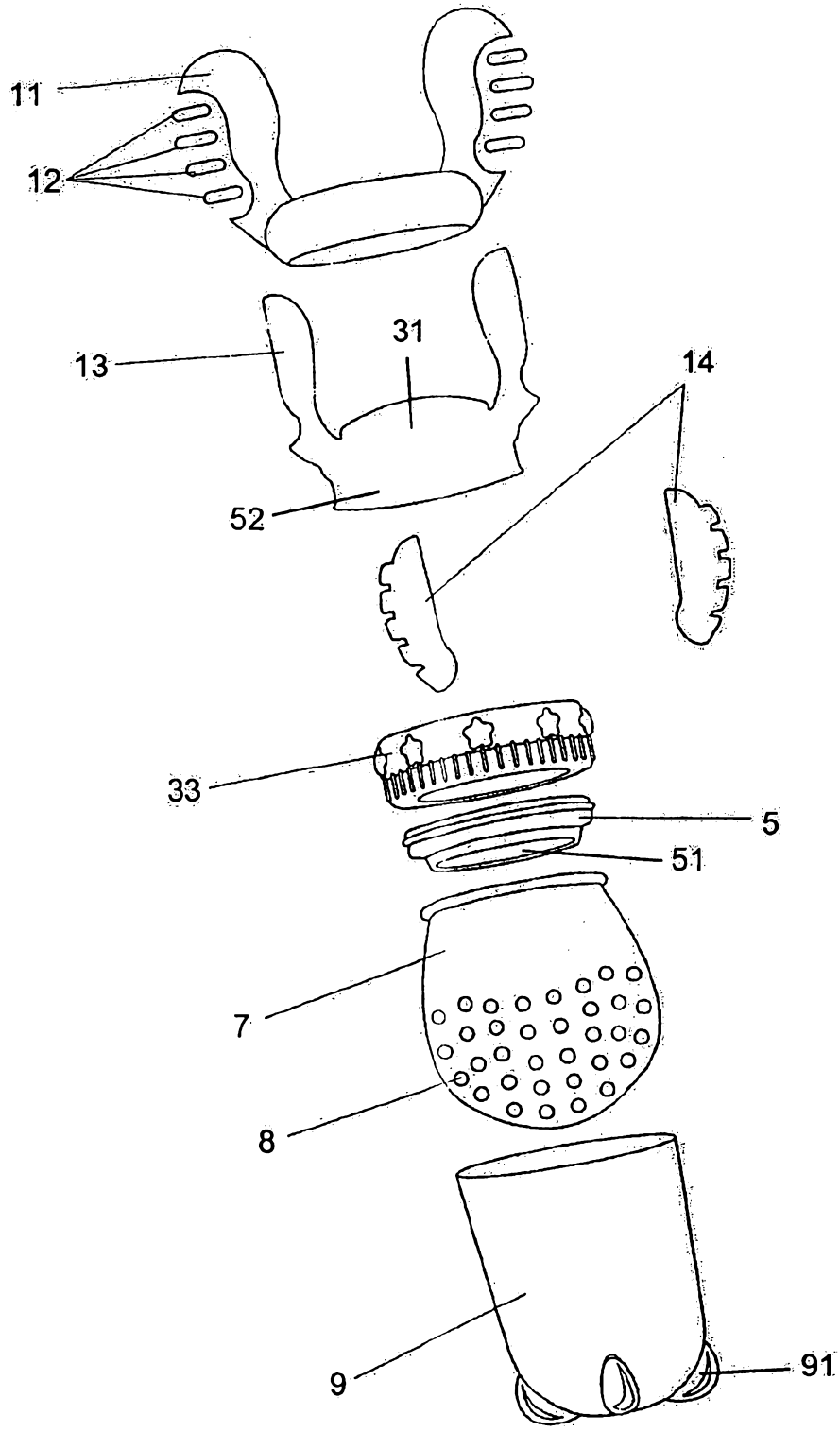

FIG. 9

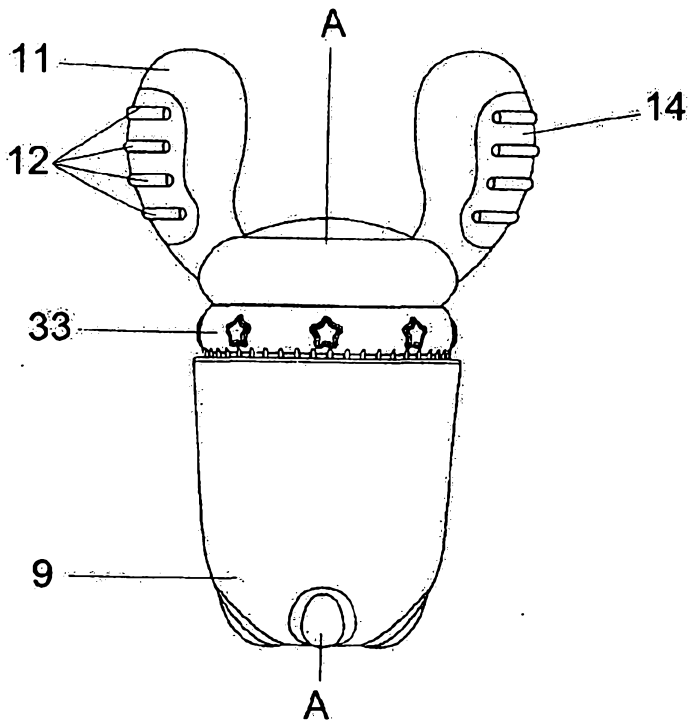

FIG. 10

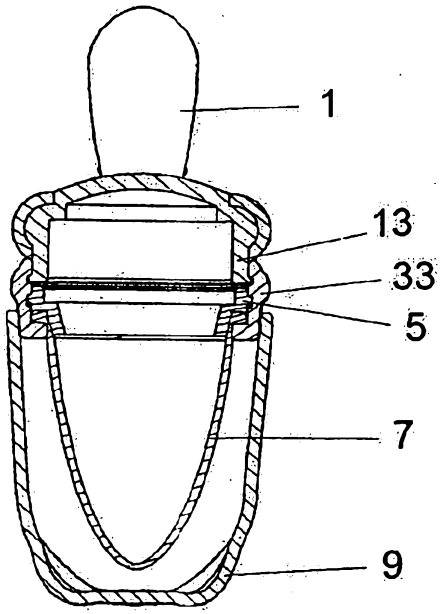

FIG. 11

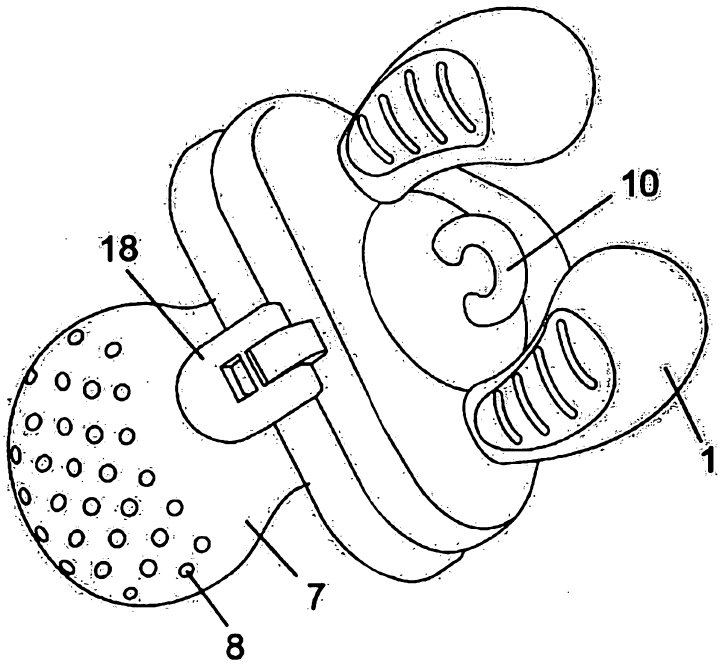

FIG. 12

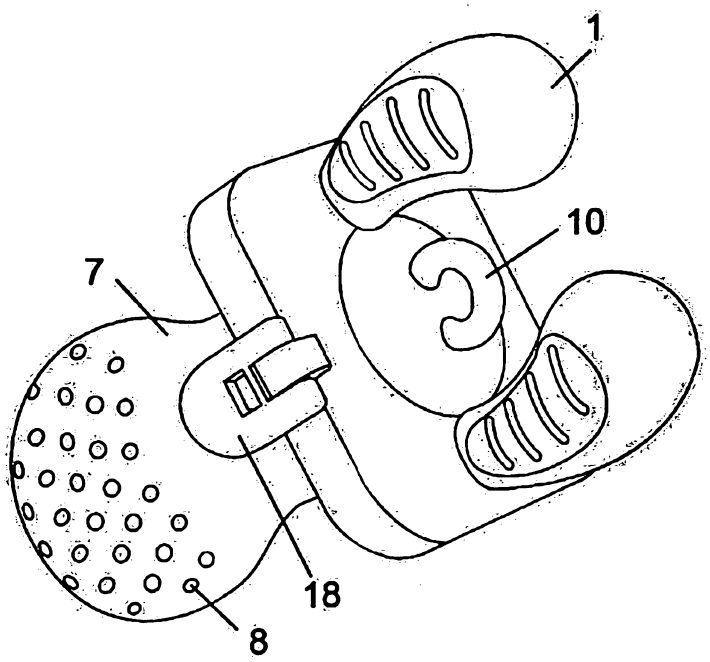

FIG. 13

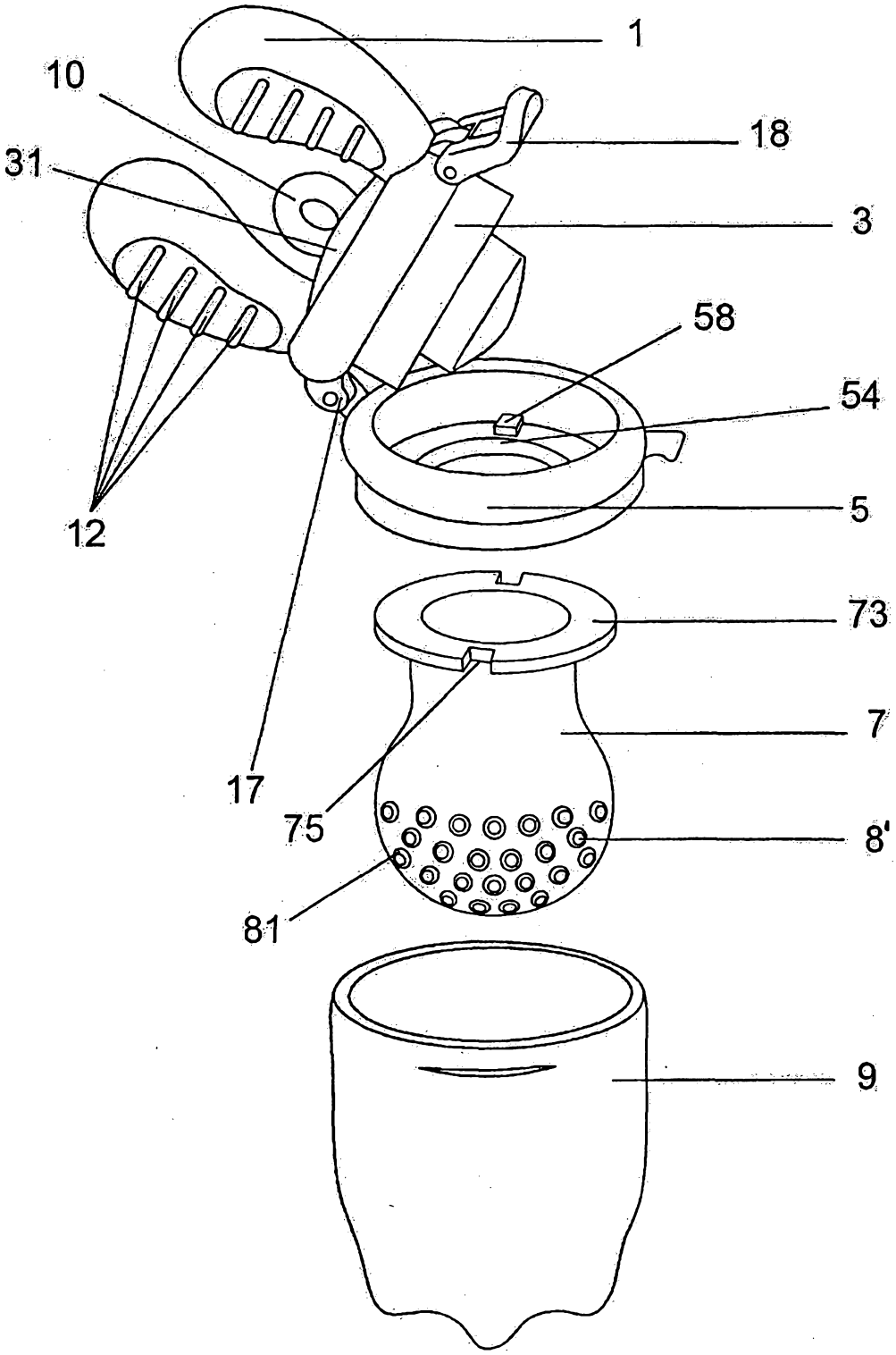

FIG. 14

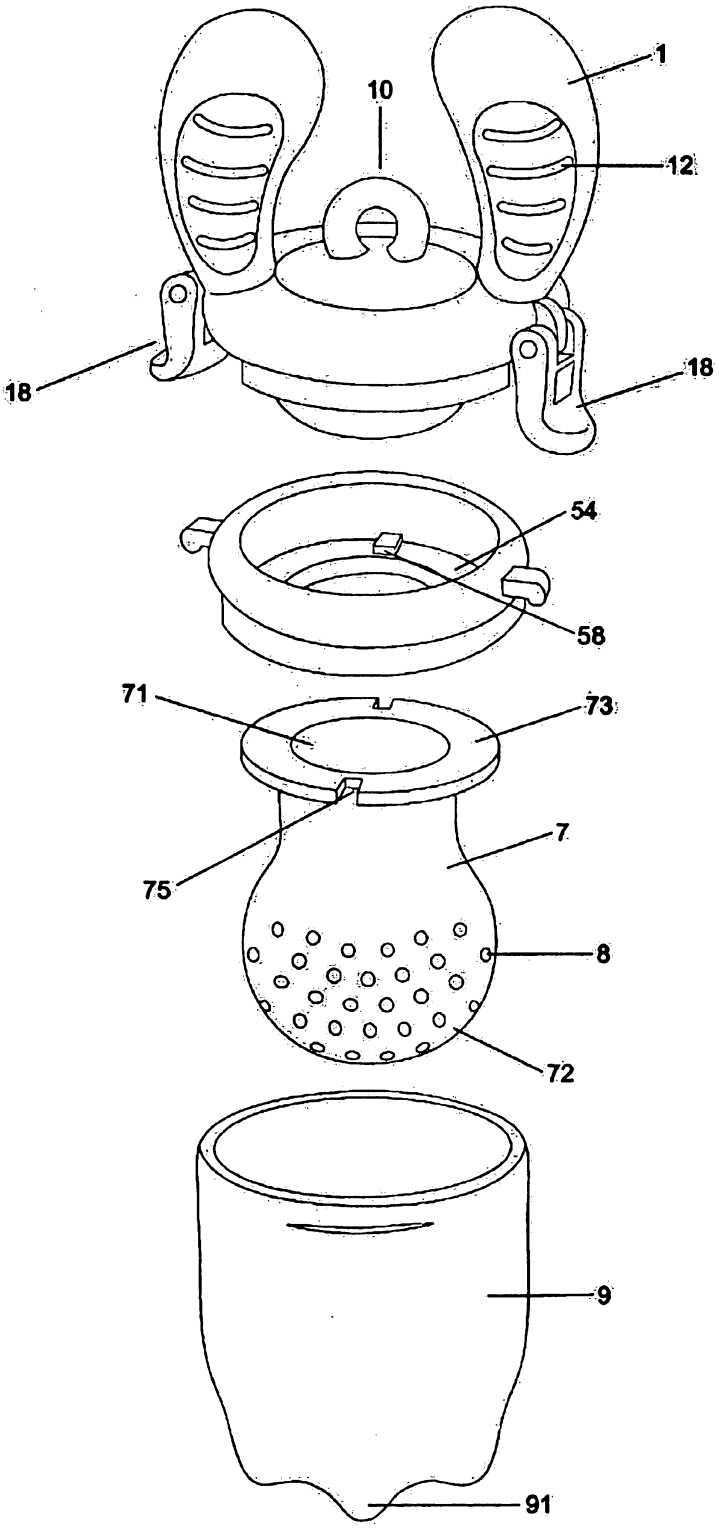

FIG. 15

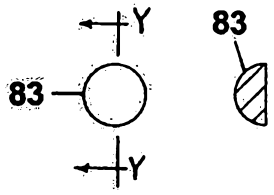

FIG. 16c

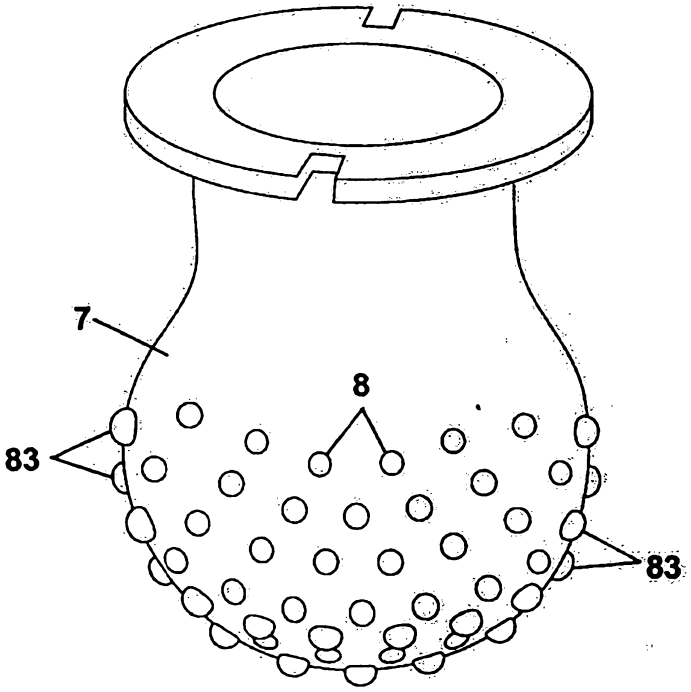

FIG. 16b

FIG. 16a

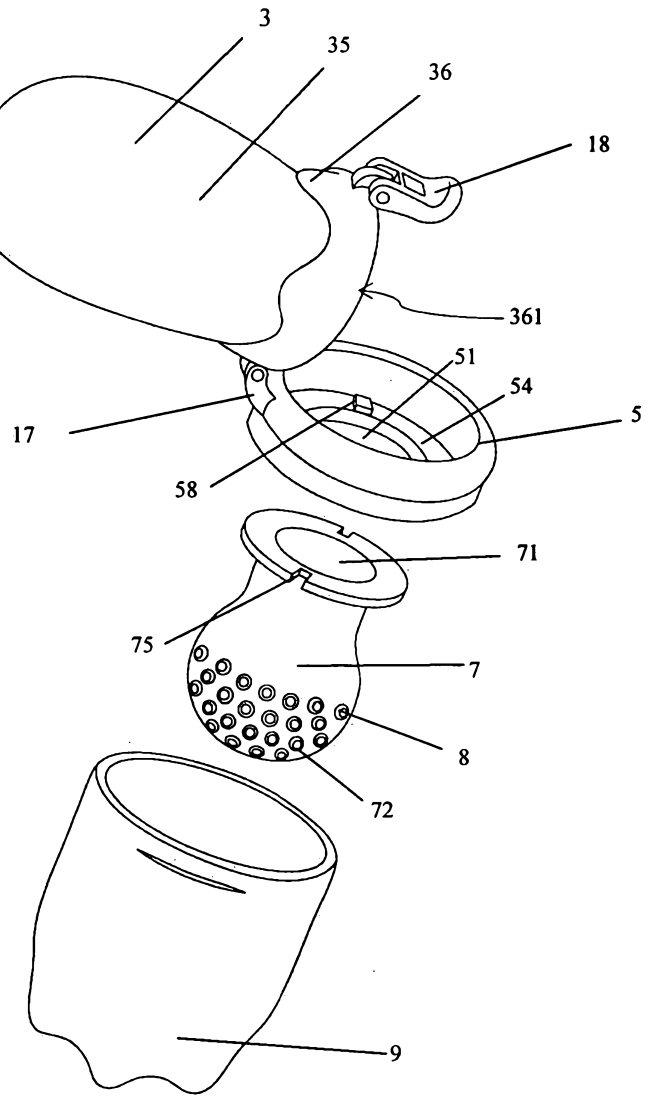

FIG. 17

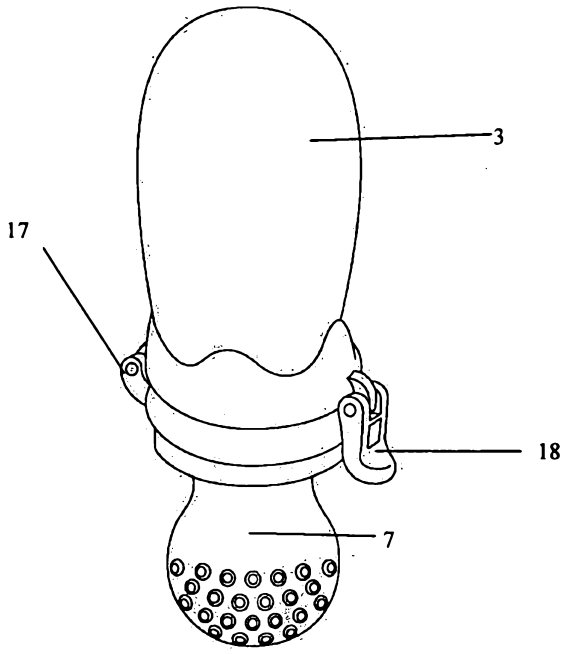

FIG. 18

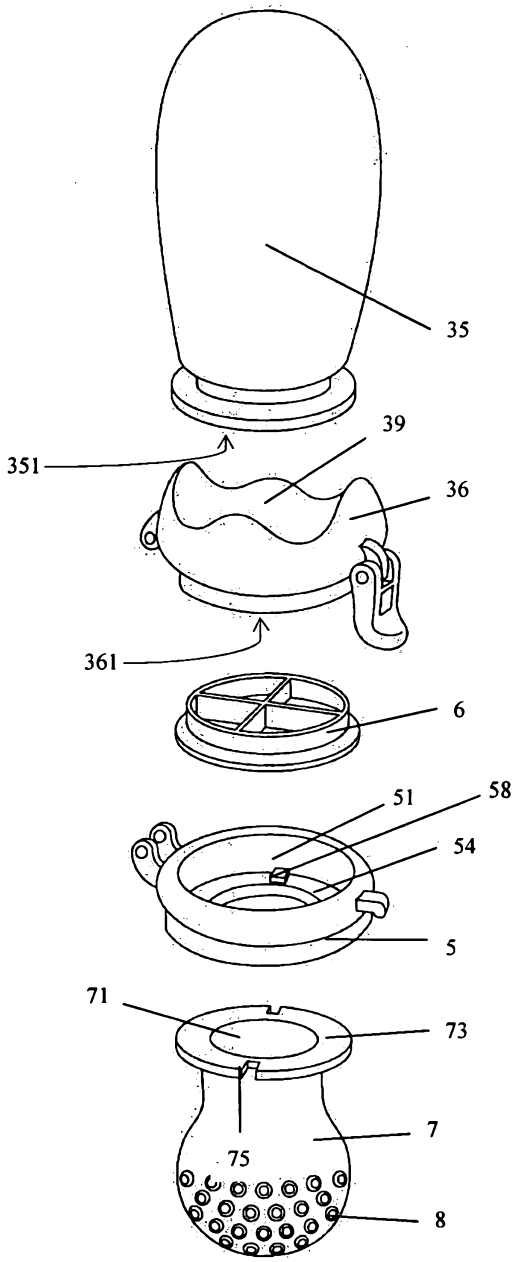

FIG. 19

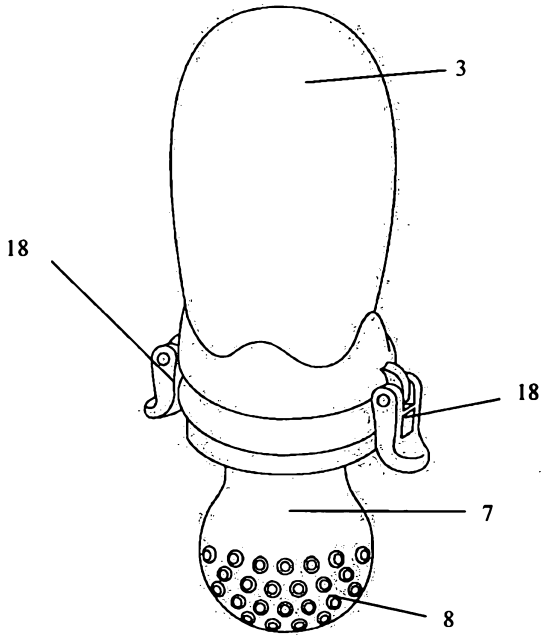

FIG. 20

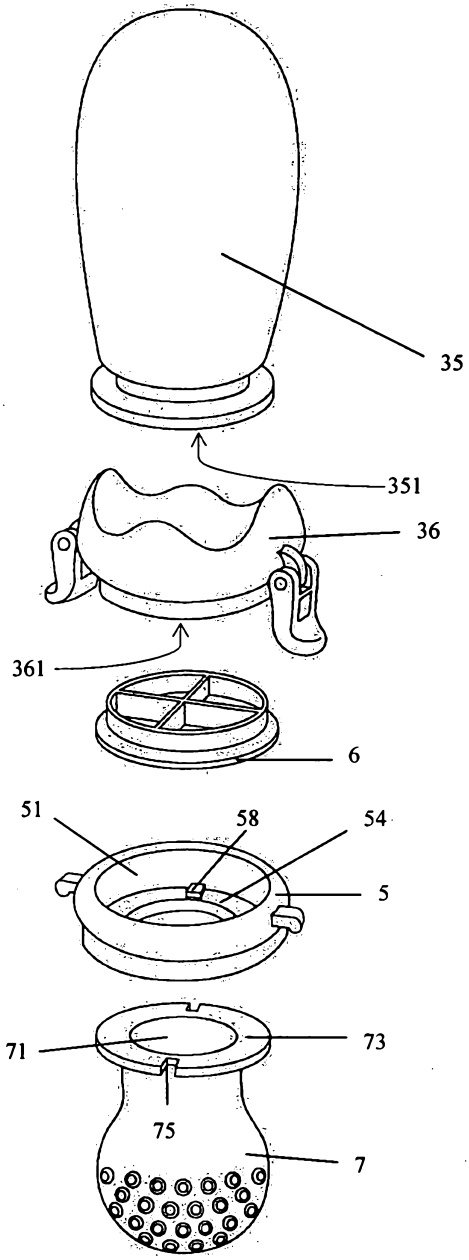

FIG. 21

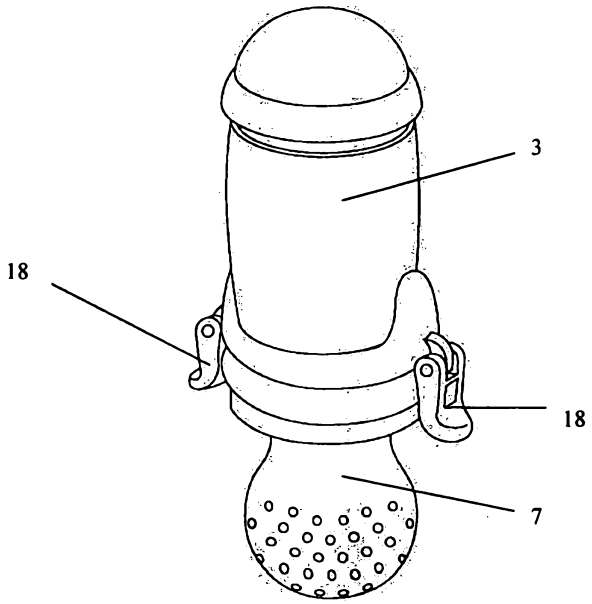

FIG. 22

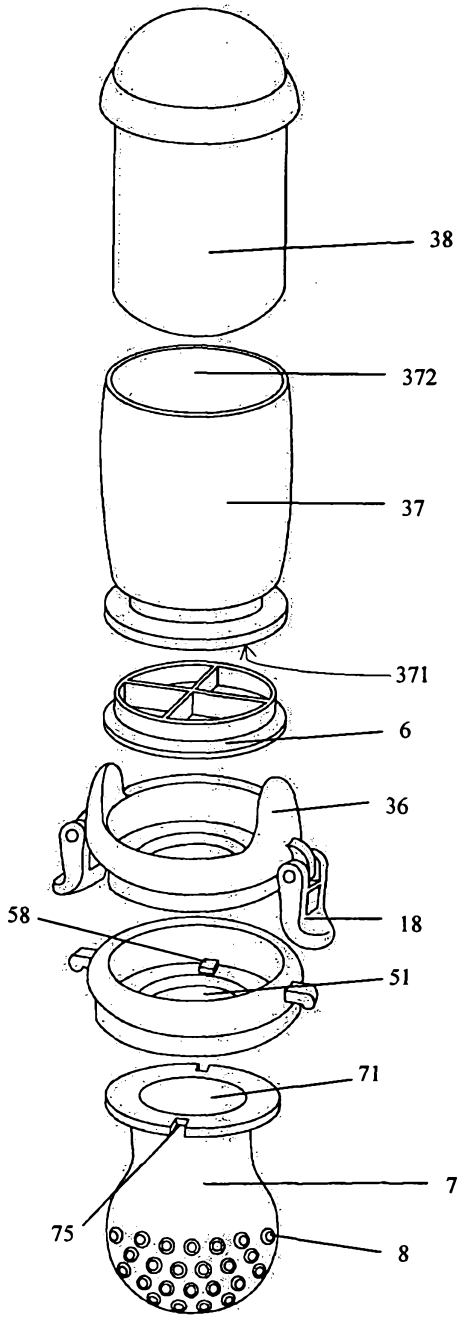

FIG. 23

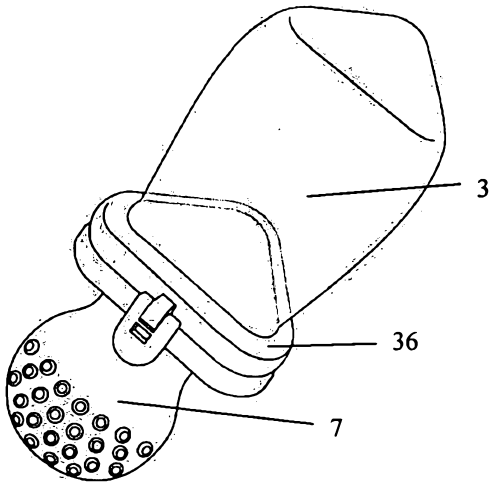

FIG. 24

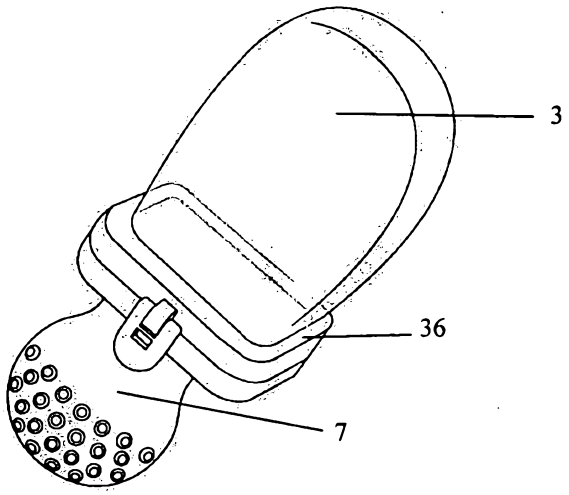

FIG. 25

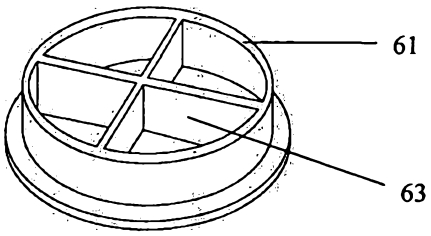

FIG. 26

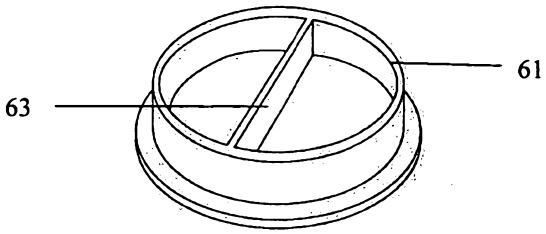

FIG. 27

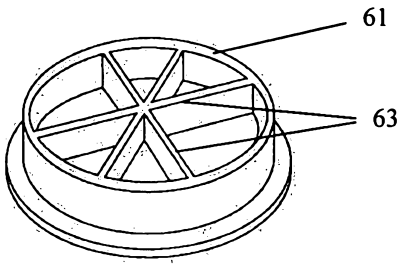

FIG. 28

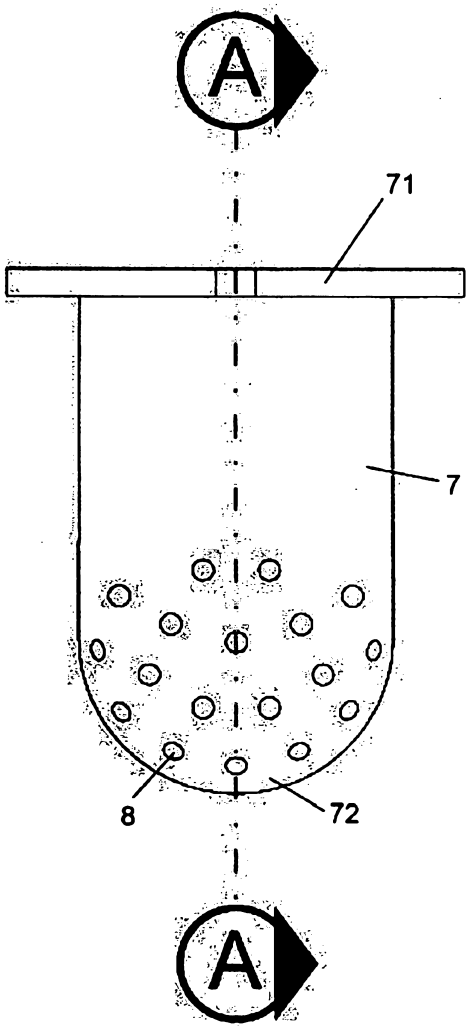

FIG. 29

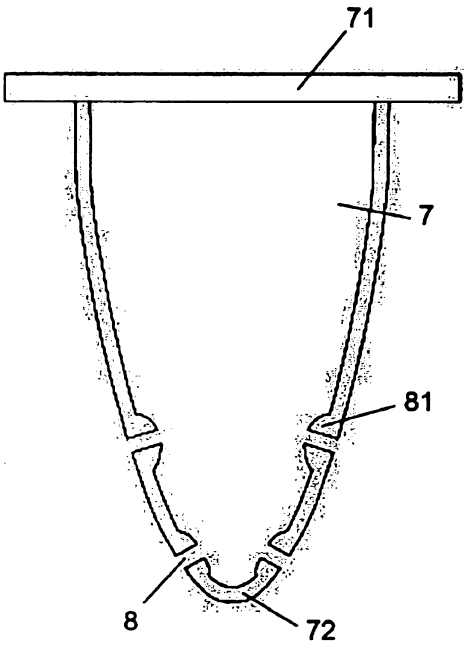

FIG. 30

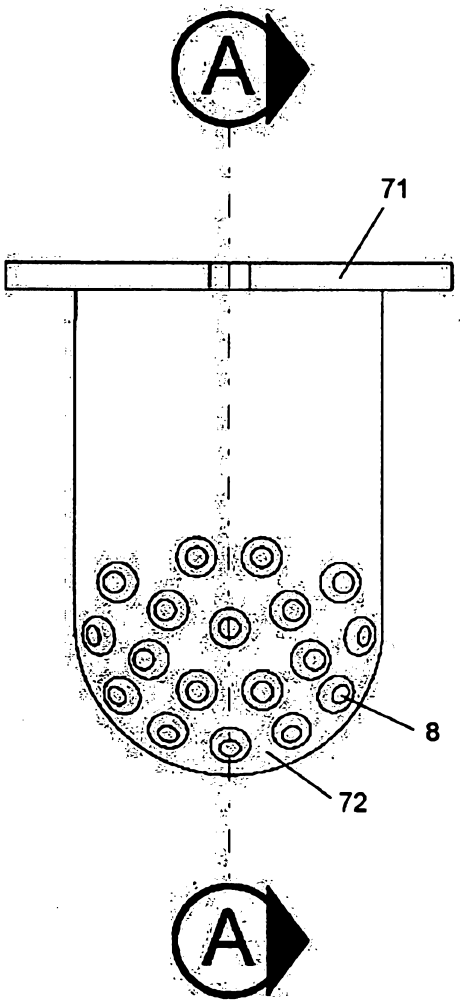

FIG. 31

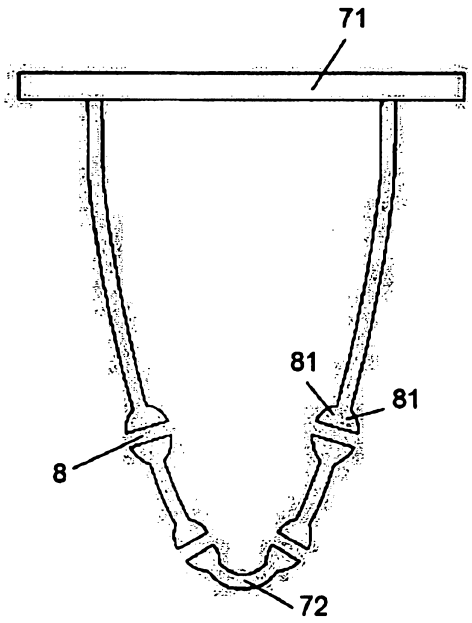

FIG. 32

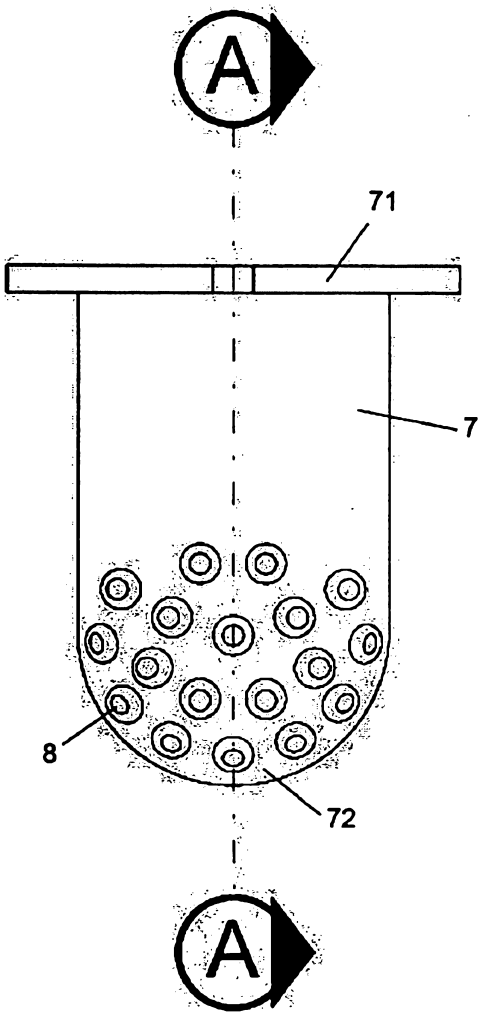

FIG. 33

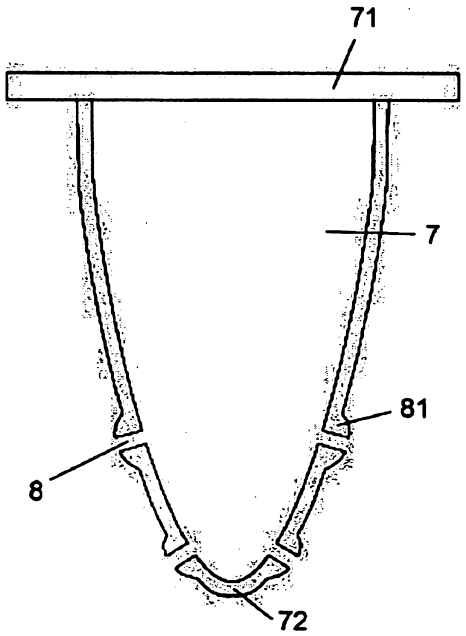

FIG. 34

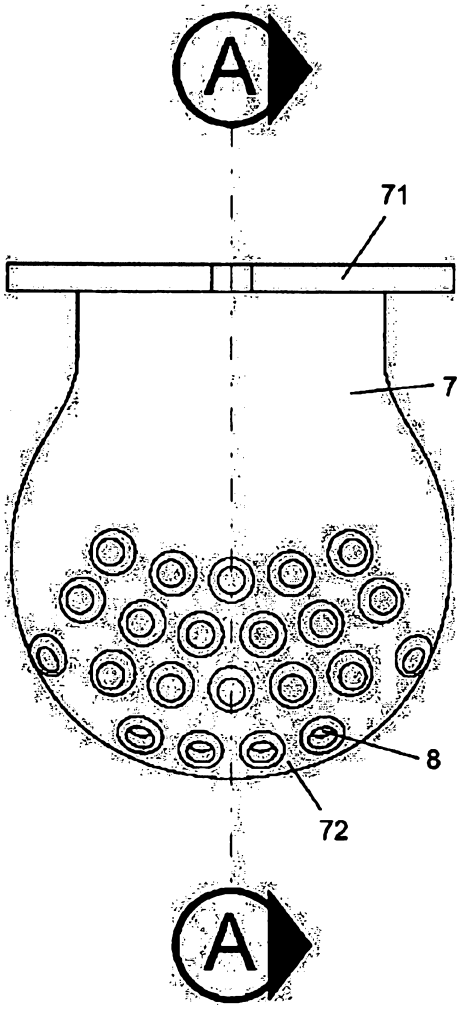

FIG. 35

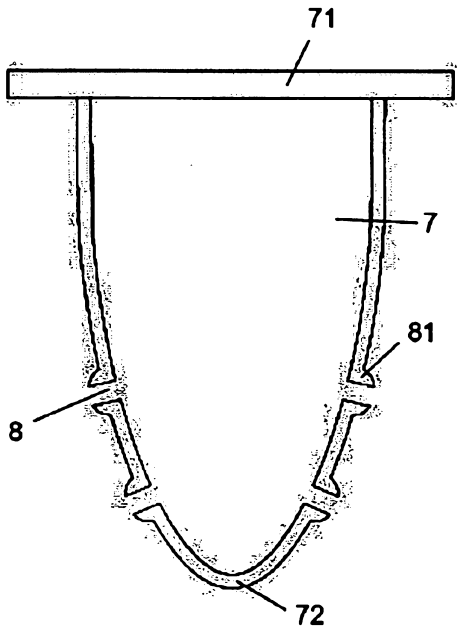

FIG. 36

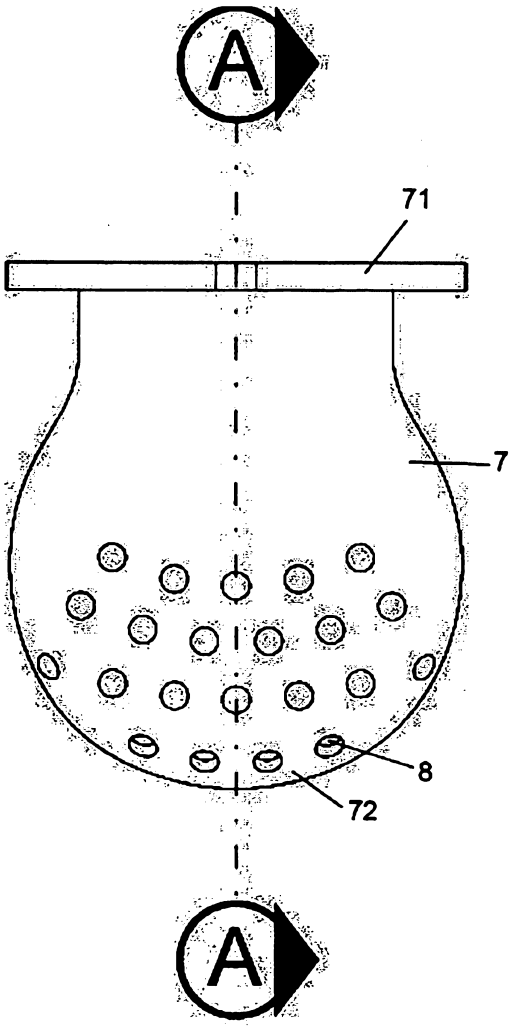

FIG. 37

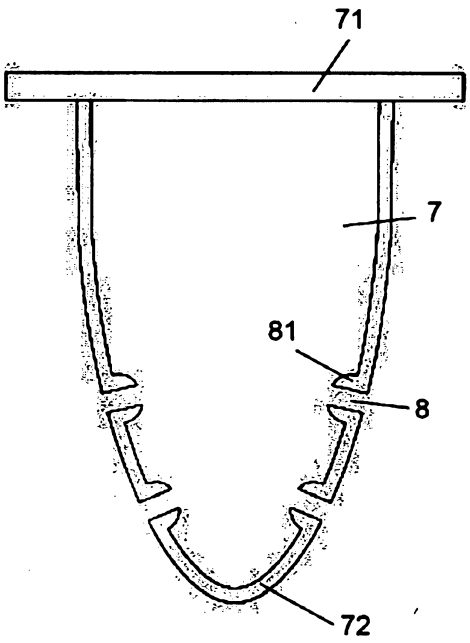

FIG. 38

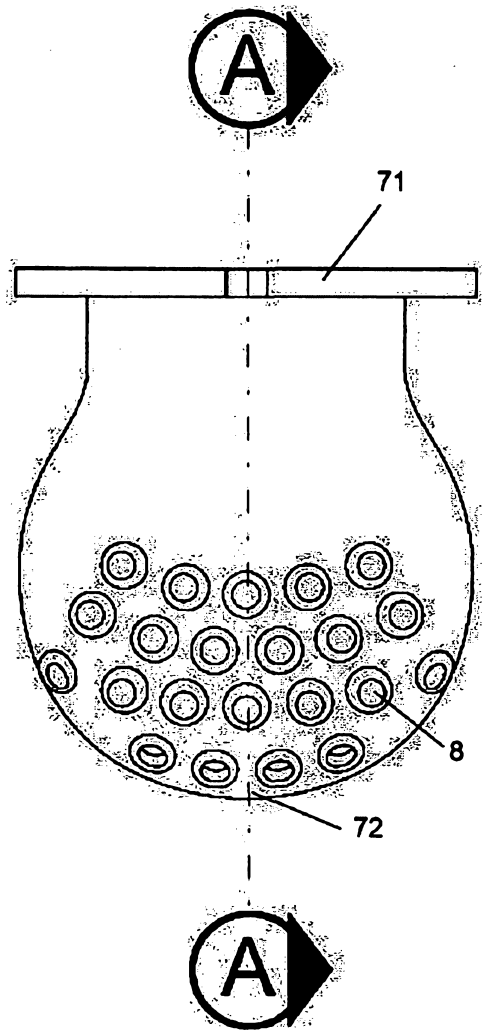

FIG. 39

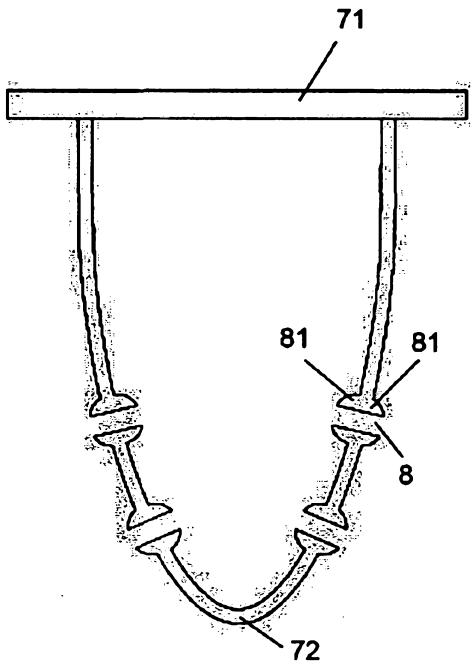

FIG. 40

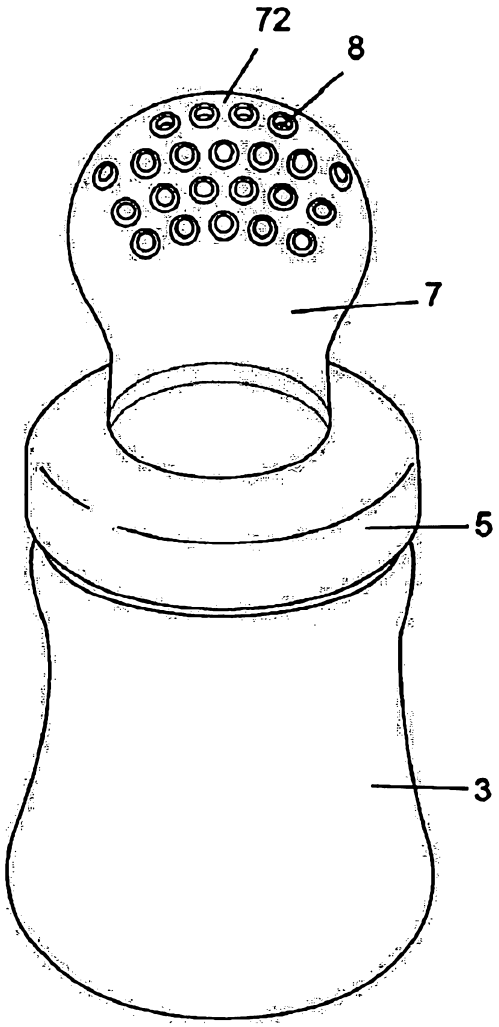

FIG. 41

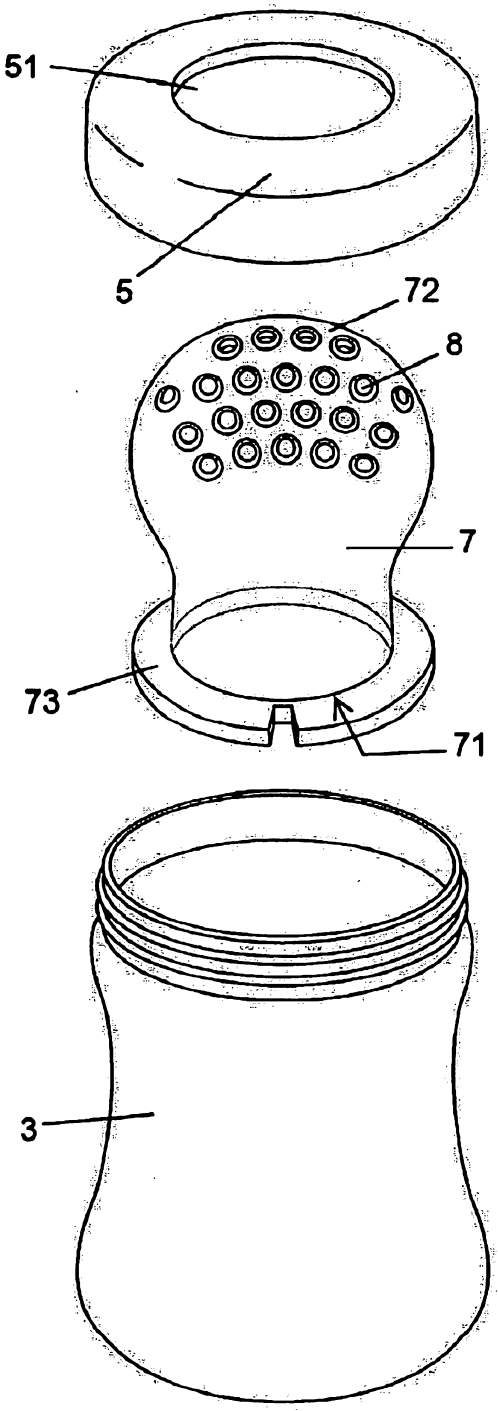

FIG. 42

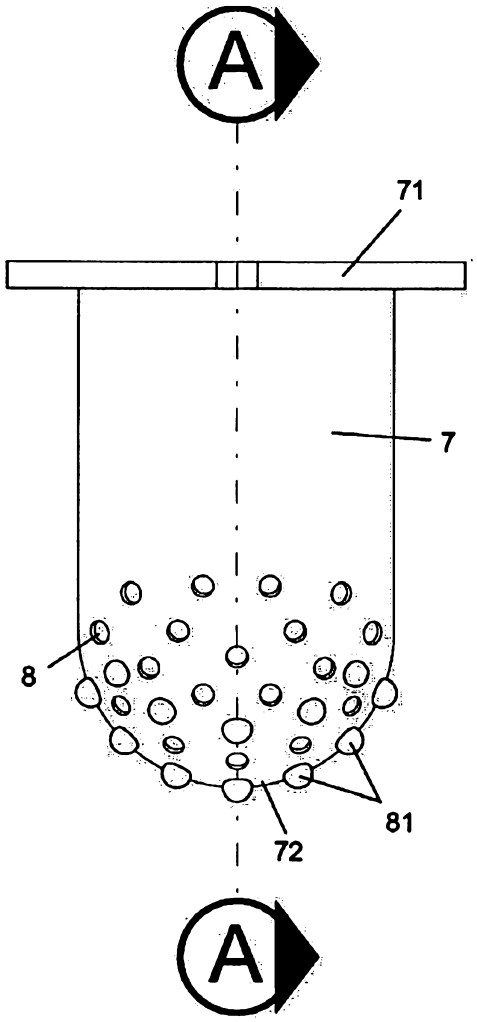

FIG. 43

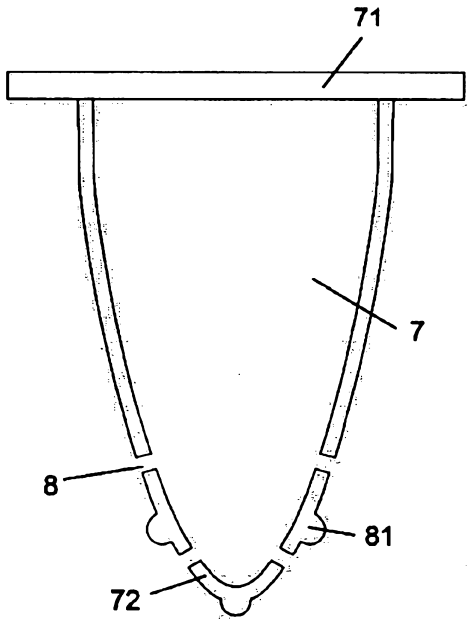

FIG. 44

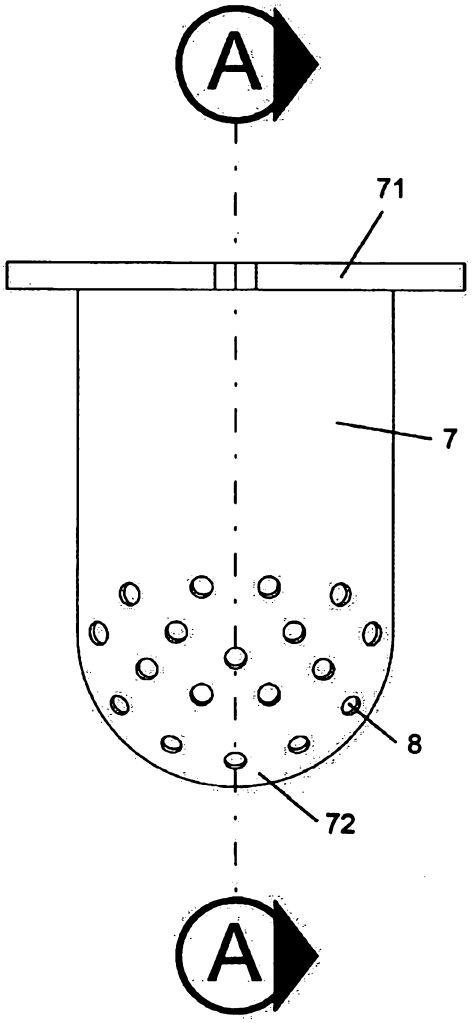

FIG. 45

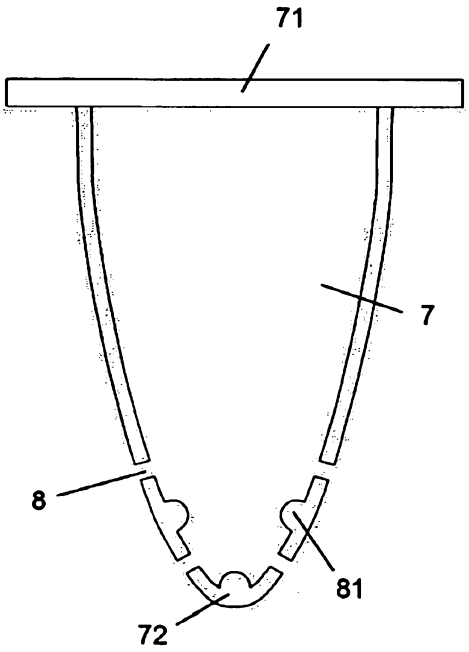

FIG. 46

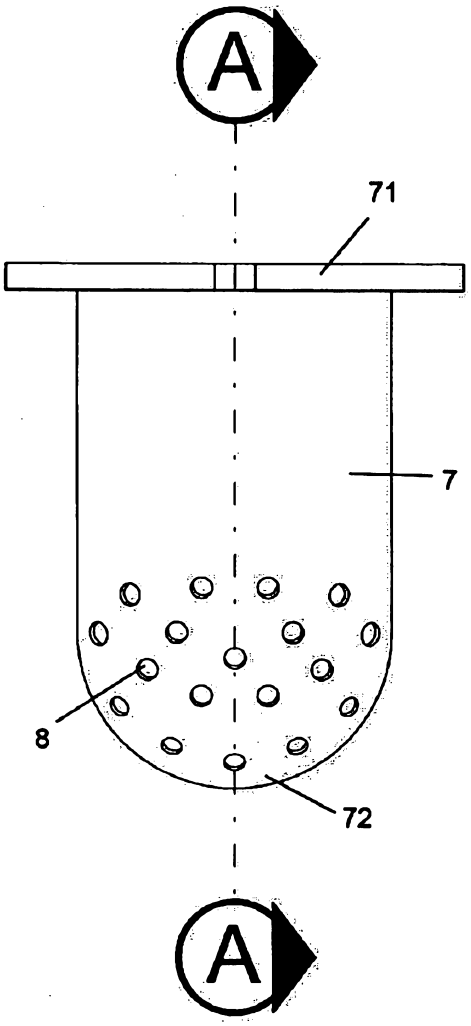

FIG. 47

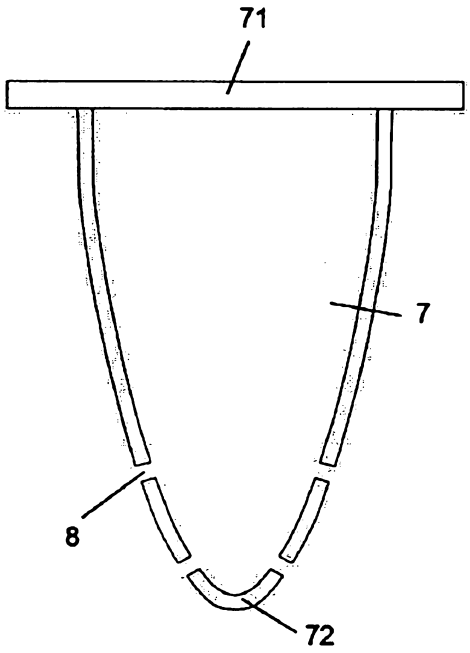

FIG. 48

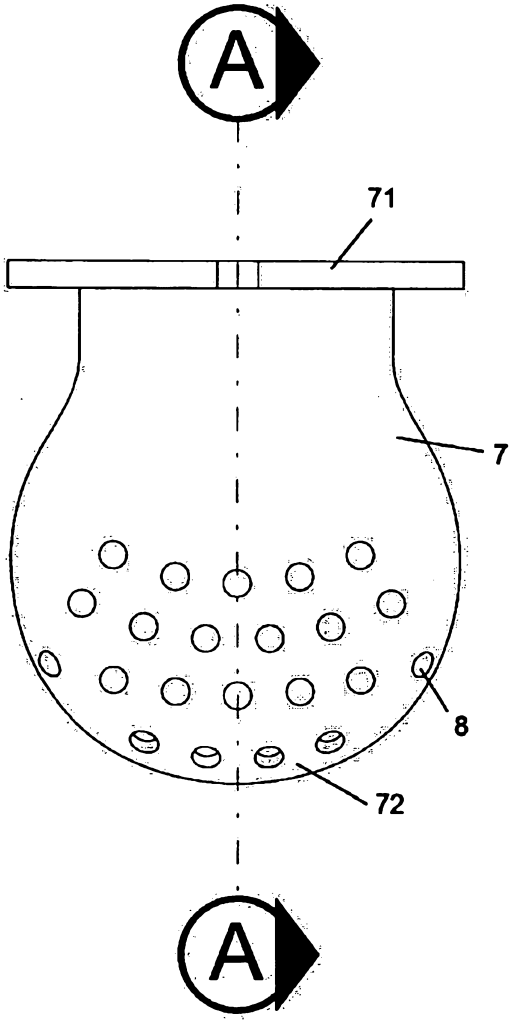

FIG. 49

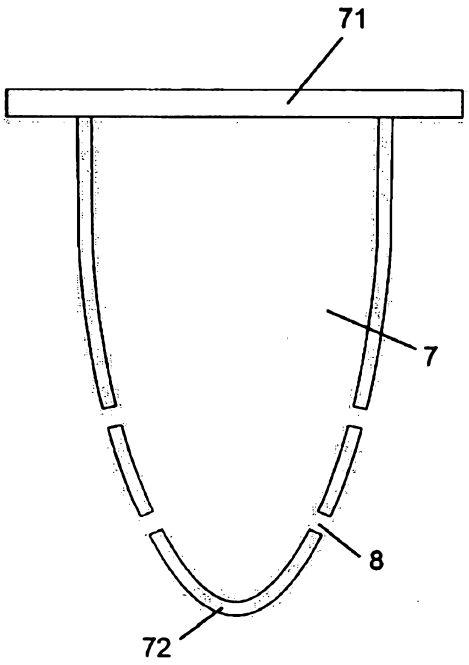

FIG. 50

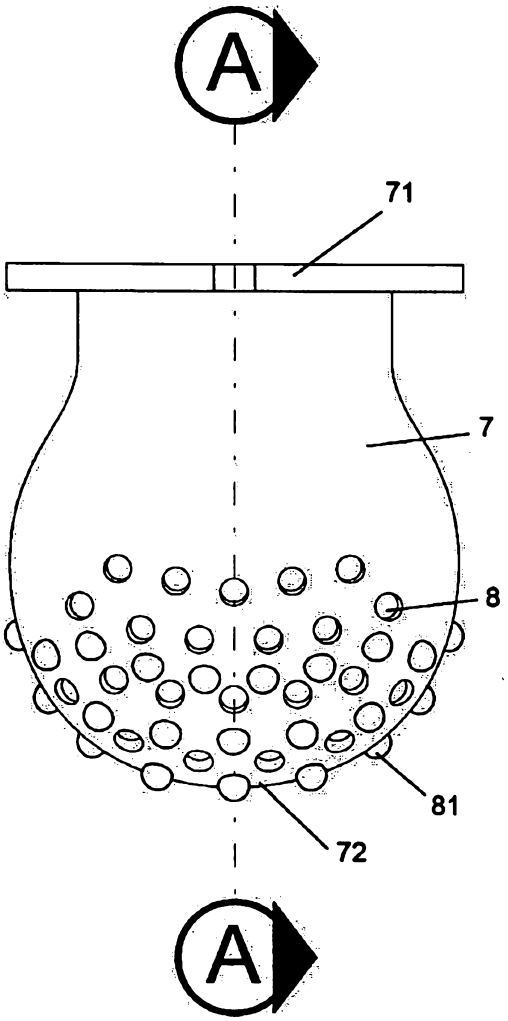

FIG. 51

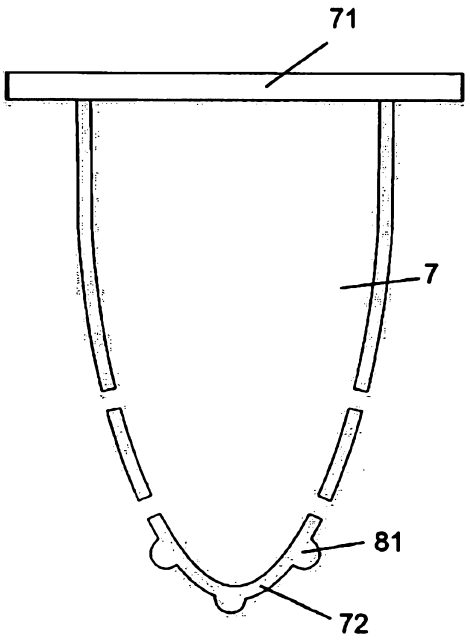

FIG. 52

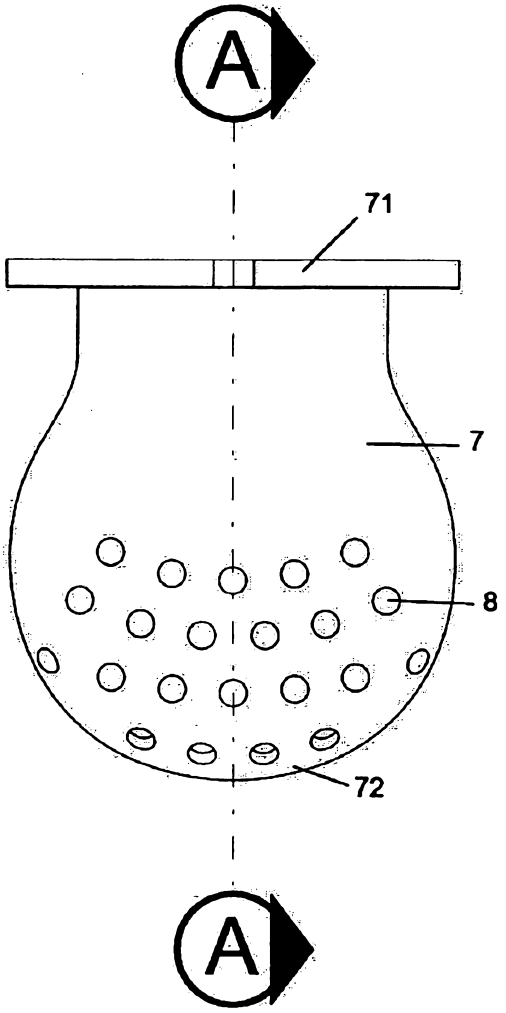

FIG. 53

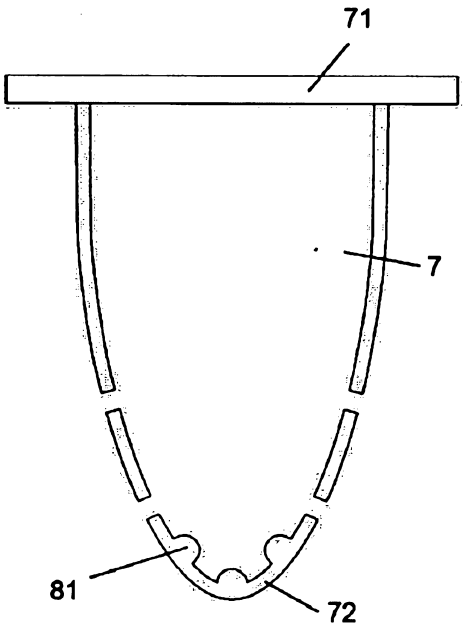

FIG. 54

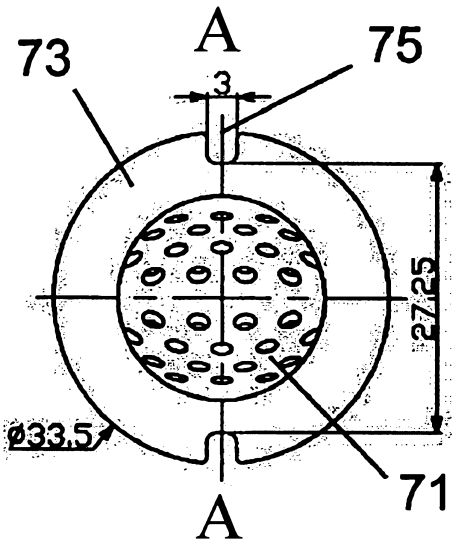

FIG. 55a

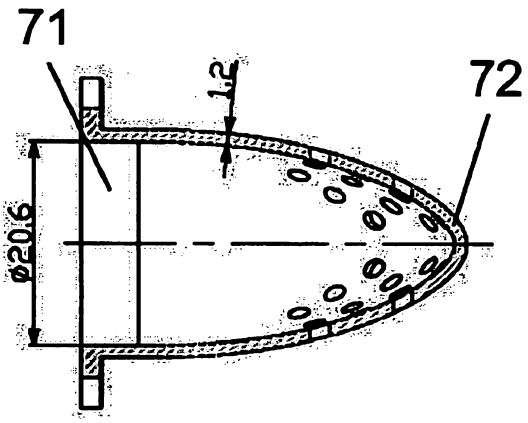

FIG. 55b

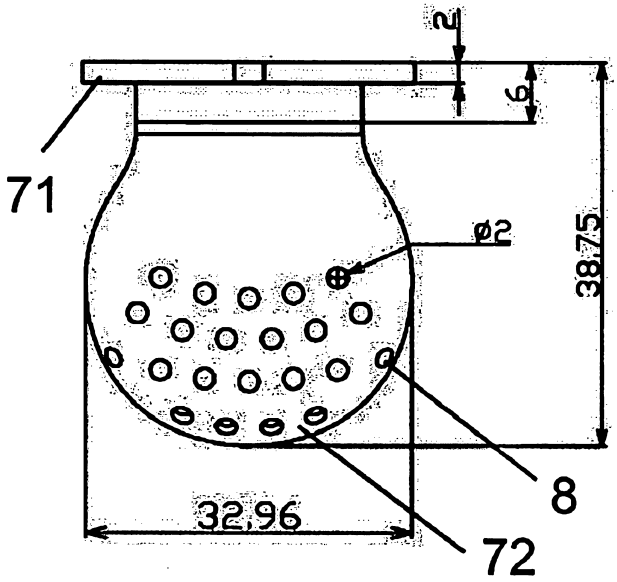

FIG. 55c

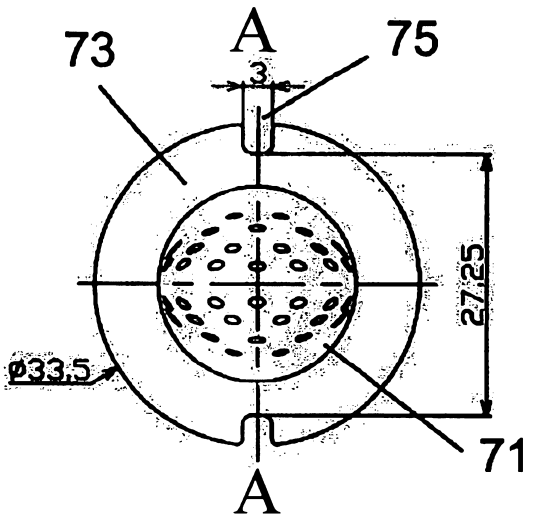

FIG. 56a

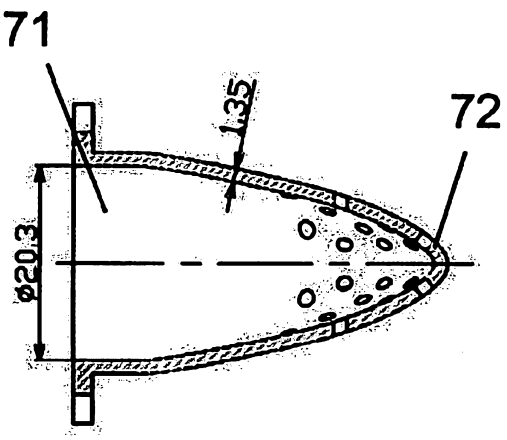

FIG. 56b

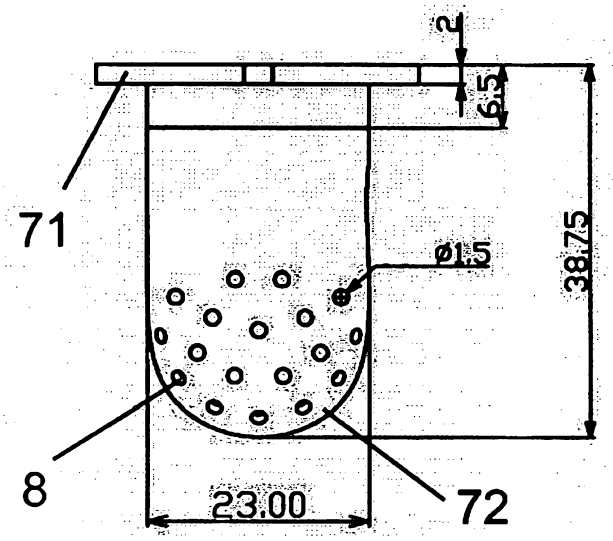

FIG. 56c