

Oct. 17, 1967

P. NATAF

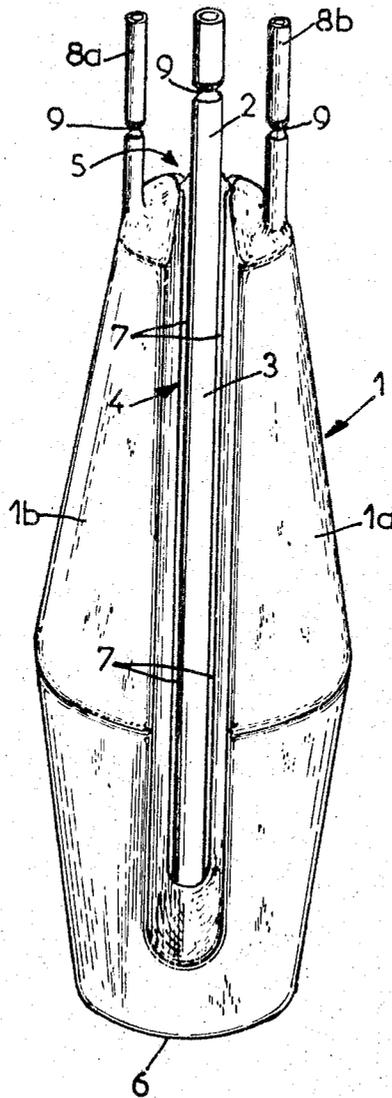
3,347,401

CONTAINER WITH EMBEDDED PIPE

Filed March 21, 1966

5 Sheets-Sheet 1

Fig. 1.



INVENTOR
PAUL NATAF
By: *Molle & Molle*
ATTORNEYS

Oct. 17, 1967

P. NATAF

3,347,401

CONTAINER WITH EMBEDDED PIPE

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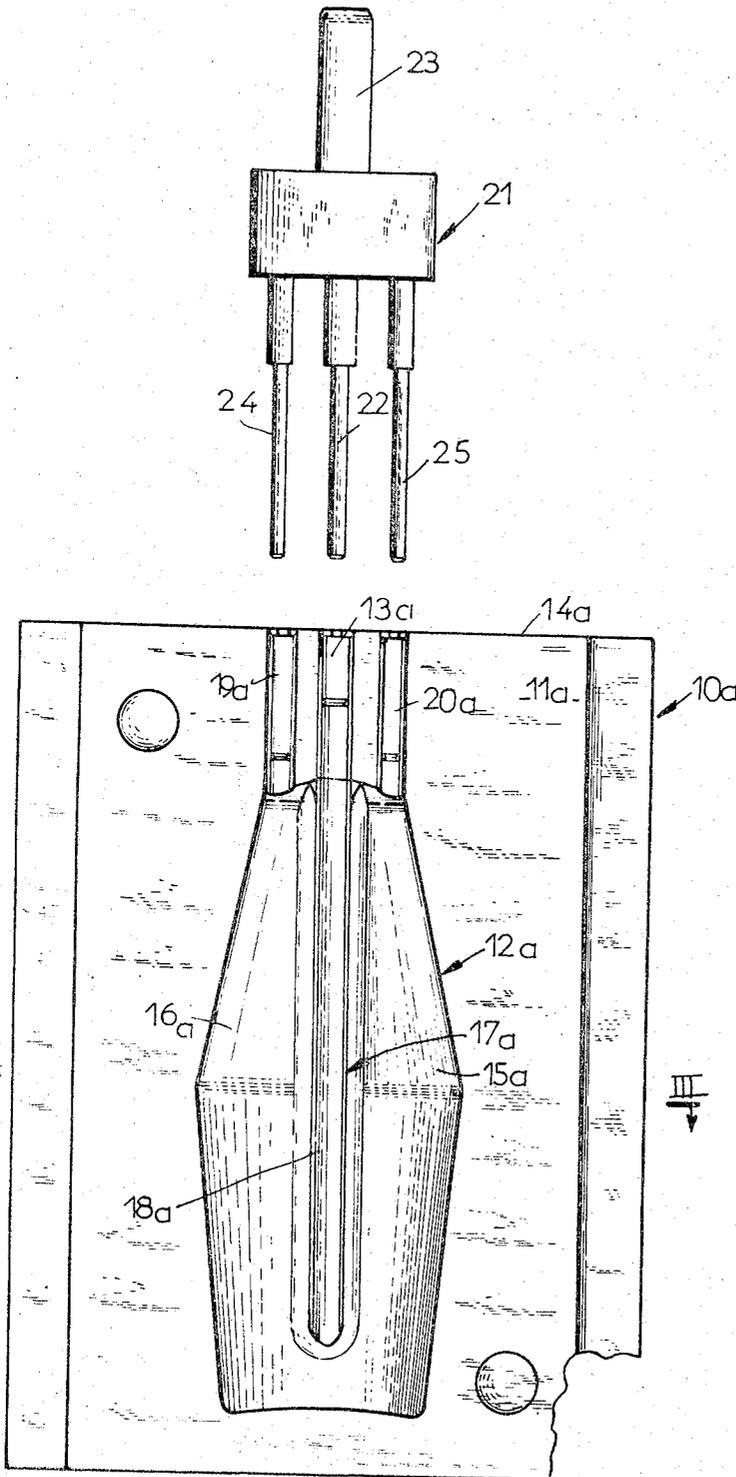


Fig. 2.

INVENTOR
PAUL NATAF
By: *Malle & Malle*
ATTORNEYS

Oct. 17, 1967

P. NATAF

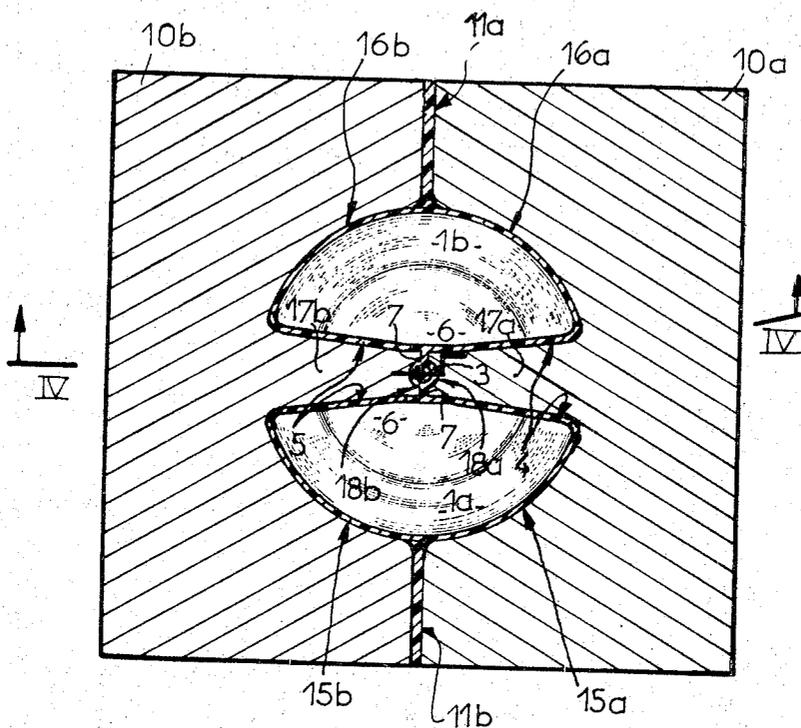
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CONTAINER WITH EMBEDDED PIPE

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Fig. 3.



INVENTOR
PAUL NATAF
By: Malke & Malke
ATTORNEYS

Oct. 17, 1967

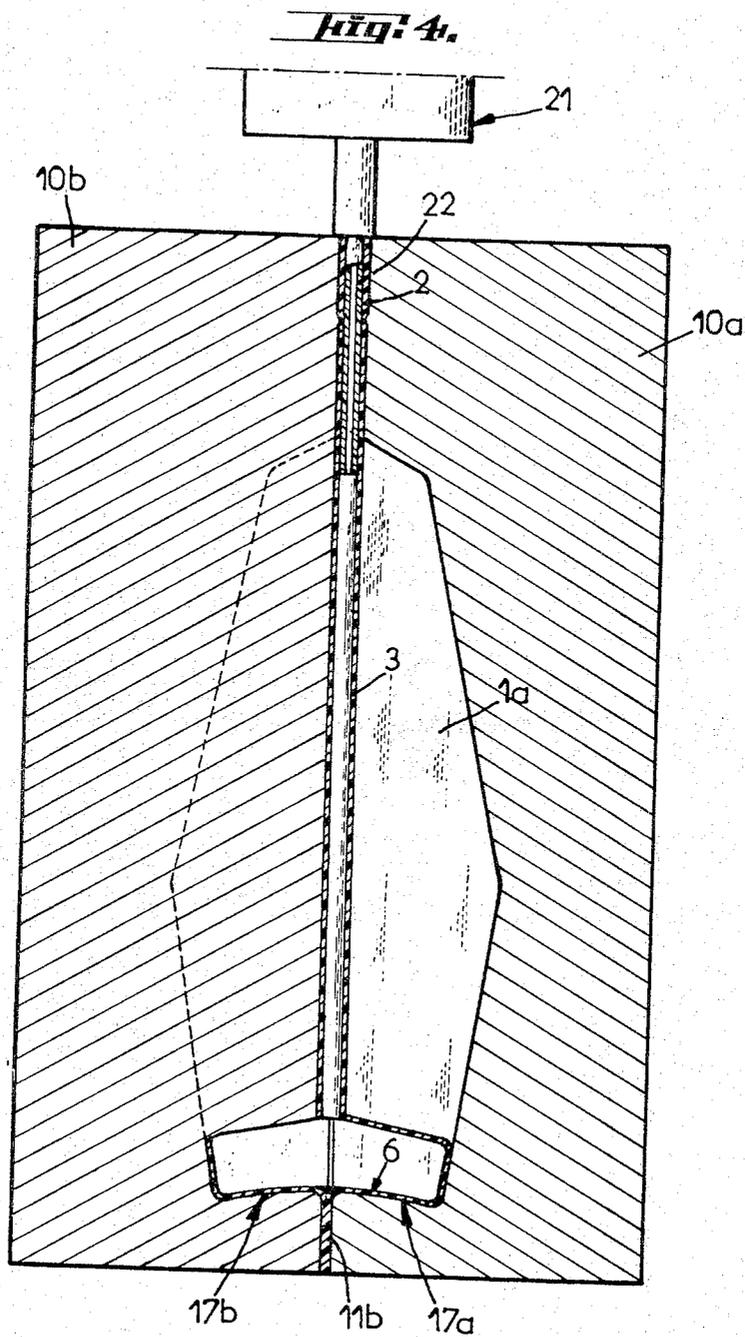
P. NATAF

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CONTAINER WITH EMBEDDED PIPE

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INVENTOR

PAUL NATAF

By: *Nolte & Nolte*

ATTORNEYS

Oct. 17, 1967

P. NATAF

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CONTAINER WITH EMBEDDED PIPE

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Fig. 7

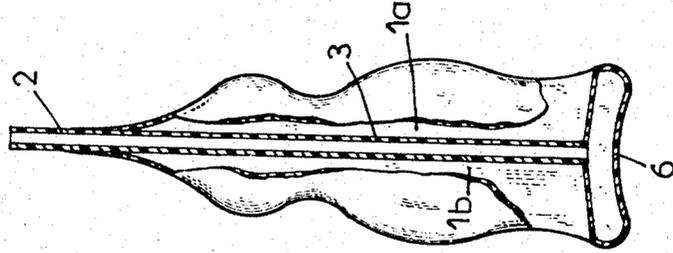


Fig. 6

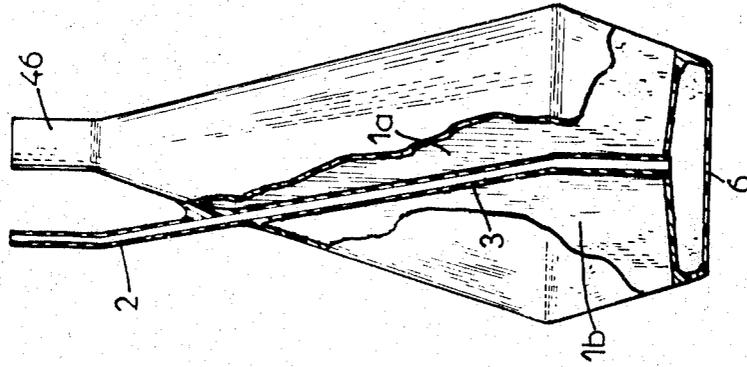
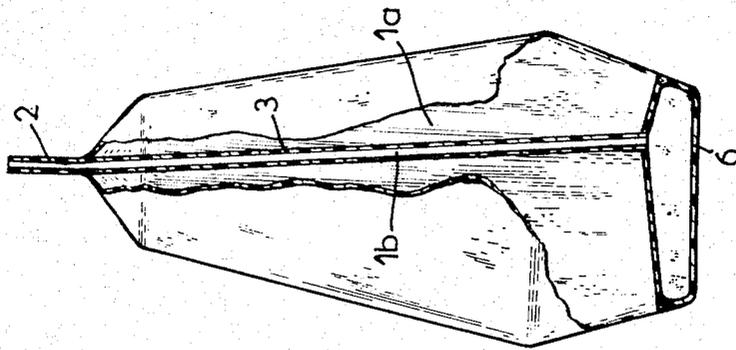


Fig. 5



3,347,401

CONTAINER WITH EMBEDDED PIPE

Paul Nataf, 54 rue de Sablonville,
Neuilly-sur-Seine, France

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Claims priority, application France, Mar. 24, 1965,
10,512; June 5, 1965, 19,755

8 Claims. (Cl. 215-1)

The present invention has essentially for its object a hollow body such as a bottle or like container intended for containing a liquid or semi-liquid product and made of a mouldable material such as a heat-weldable plastic material and provided with a suction pipe for exhausting this product therefrom.

The hollow body according to this invention is characterized essentially in that the aforesaid exhaust or suction pipe comprises a section projecting externally from said hollow body and another section embedded in said hollow body and extending to a short distance from its bottom.

According to another feature characterizing this invention the embedded portion of said pipe is formed between at least two recesses of said hollow body which are welded to each other preferably along two parallel weld lines and so shaped, between said two weld lines, as to provide therebetween a channel permitting the passage of the liquid or semi-liquid product.

The embedded pipe section obtained by juxtaposing and die-welding two thicknesses of the extruded tube is more rigid than the wall of said hollow body. This feature is particularly important when the hollow body is manufactured from a very flexible material for the embedded pipe section, due to its rigidity, increases considerably the resistance to compressive stress of the hollow body when a vertical pressure is applied thereto, for example with the hand. This rigidity also affords a better resistance of said hollow body to the pressure exerted by its fluid content.

According to another feature of this invention, the aforesaid recesses are so designed as to permit the insertion of the user's fingers when he grips the hollow body with the hand, and furthermore they are preferably out-flared to facilitate this insertion.

Thus, the user can easily grip the hollow body by simply engaging his fingers into said recesses, a safer grip being obtained by squeezing between the fingers the embedded pipe constituting the stiffest portion of the hollow body.

According to another feature characterizing the present invention, said embedded pipe section is in axial alignment with the projecting pipe section.

According to a complementary feature of this invention, each shell comprises, in addition, at least one groove, formed in the joint plane and forming, when the mould is closed, another channel communicating with the aforesaid channel formed by the grooves of said partitions.

Finally, this invention is characterized in that the channel formed by the two grooves formed in the joint planes of said shells is adapted to receive a mandrel comprising at least one hollow tube for introducing gas under pressure into the mould by means of the channel formed between said two partitions.

Other features and advantages of this invention will appear as the following description proceeds with reference to the attached drawings illustrating diagrammatically by way of example various forms of embodiment of the invention. In the drawings:

FIGURE 1 is a perspective view showing a hollow body according to a first form of embodiment of the invention;

FIGURE 2 is a detail view showing one of the shells of a mould constructed according to the teachings of this invention, together with the mandrel associated with this mould;

FIGURE 3 is a cross-sectional view of a mould consisting of two shells similar to the one shown in FIGURE 2, this section being taken upon the line III—III of FIGURE 2;

FIGURE 4 is a section taken upon the line IV—IV of FIGURE 3;

FIGURE 5 illustrates diagrammatically in elevational view with parts broken away a hollow body according to a first modified form of embodiment of this invention;

FIGURE 6 illustrates diagrammatically in elevational view with parts broken away a hollow body according to another modified form of embodiment of the invention, and

FIGURE 7 illustrates diagrammatically in elevational view with parts broken away a hollow body according to a third modified form of embodiment of this invention.

Referring first to the form of embodiment illustrated in FIGURE 1, (and also visible in FIGURES 3 and 4) the hollow body **1** according to this invention is a bottle adapted to be filled with any desired beverage, for example fruit juice. It consists of heat-weldable plastic material such as polyethylene and comprises an exhaust pipe or nozzle including a projecting section **2** and an internal or embedded section **3** constituting the internal extension of said projection section **2**, and communicating with the inner space of said hollow body. The internal section **3** of said pipe is disposed between two symmetric recesses **4** and **5** extending from the upper portion of the hollow body, i.e. from the base of the projecting pipe section **2**, to a short distance (for example a few millimeters) from the bottom **6** of said hollow body.

These symmetric recesses **4** and **5** consist of two identical diametrically opposite cavities formed in the wall of the plastic bottle. The bottoms of these cavities or recesses are shaped to include a substantially semi-circular groove whereby these bottoms constitute the embedded or internal portion of the pipe when they are welded along two weld lines **7**.

These recesses **4** and **5** divide the bottle **1** into two identical cavities **1a** and **1b** communicating with each other at their lower portions, that is, between the lower portion of the embedded pipe section **3** and the bottom **6** of the bottle.

The cavities **1a** and **1b** are provided at their upper portion with pipe or nozzle means **8a** and **8b** communicating with the surrounding atmosphere.

The bottle **1** is filled by introducing the liquid product for example through the exhaust pipe, the other pipes **8a** and **8b** acting as vent holes in this case. When the bottle is full the pipe **2** is sealed as well as the pipes **8a** and **8b** by squeezing or welding their upper ends or edges.

For sucking up the liquid content there is only to break the projecting pipe section **2** as well as the pipes **8a** and **8b** along the restricted portions **9** and then to exhaust the liquid content from the bottle.

If the bottle is made from sufficiently flexible material, it is possible to dispense with the opening of pipes **8a** and **8b** since the cavities may be flattened out by the atmospheric pressure as they are emptied. In this case, exerting a slight pressure on the upper portions of cavities **1a** and **1b** is sufficient to cause the pipes **8a** and **8b** to diverge so as to enable the user to introduce the exhaust pipe **2** between his or her lips.

It should be noted that in spite of the space left between the lower portion of the embedded pipe section **3** and the bottom **6** of the container, the liquid can be drawn completely therefrom since the liquid possibly remaining in the bottom of the bottle can be raised to the pipe level by simply crushing the bottle bottom for example between two fingers.

It should also be noted that the gripping of the container

is considerably facilitated by the provision of the two recesses 4 and 5. The user inserts for example the thumb into one of these recesses and the other fingers of the hand into the opposite recess, the finger tips contact the embedded pipe section, that is, a rigid and easily gripped bottle portion.

The cavities 1a and 1b, including the one lying in the palm of the user's hand, are practically free of any stress and therefore not liable to detrimental distortion, even if the bottle is moulded from very flexible material.

FIGURE 2 illustrates one of the two shells 10a constituting a mould according to this invention. This shell comprises an upper face 11a forming the joint plane and contacting in the closed mould position the registering face 11b of the associated shell 10b (see FIGURES 3 and 4). This shell 10a comprises a hollow portion cavity or impression 12a corresponding to the general configuration which it is desired to impart to the hollow body. A groove 13a for example of semi-circular cross-sectional contour extends from this cavity 12a and leads to the top face 14a of shell 10a. This groove 13a corresponds to the pipe 2 of bottle 1. The cavity 12a is divided into two identical recesses 15a and 16a by a partition 17a formed integrally with the shell and aligned with the aforesaid groove 13a. The upper edge of this partition 17a which, in the case illustrated, is substantially level with the joint plane 11a, comprises a groove 18a extending throughout its length and constitutes the extension of the aforesaid groove 13a. The thickness of said partition 17a increases from its edge to the bottom of the cavity 12a, so as to have an outflared shape corresponding to that of the recesses 4 and 5 of bottle 1.

Between each one of said cavities 15a and 16a and the top face 14a of the mould two grooves 19a and 20a disposed on either side of said groove 13a and symmetrically thereto are provided and correspond to the vent pipes 8a and 8b of the bottle.

There is also shown in FIGURE 2 a mandrel 21 acting as an extrusion die to form the exhaust pipe and the vent pipes 8a and 8b. This mandrel comprises on the one hand a central tube 22 of a length slightly superior to that of the groove 13a and communicates with a gas feed pipe 23, and on the other hand two rods or like members 24 and 25. This pipe 23 and rods 24, 25 have a diameter slightly inferior to that of grooves 13a, 19a and 20a so as to leave a space sufficient for the plastic when the two mould shells are in their closed position.

FIGURES 3 and 4 illustrate in cross-sectional view and in longitudinal section, respectively, a complete mould for manufacturing by the blowing method a hollow plastic body according to this invention. This mould consists of two identical shells 10a and 10b, the same elements of these two shells being designated by the same reference numerals bearing the indices a and b respectively. The two shells are disposed on either side of the plastic material constituting a double-walled structure, for example in the form of an extruded tubular sheet (not shown) but the central tube 22 and rods 24, 25 of mandrel 21 being disposed between the two walls of plastic material, for example internally of the extruded tube.

After having so disposed the mandrel that the tube 22 and rods 24, 25 register with grooves 13a, 13b; 19a, 19b and 20a, 20b, the two shells are moved towards each other to trap the plastic material therebetween.

The mandrel 21, with its tube 22 and rods 24, 25 disposed coaxially to the channels formed by the grooves 13a, 13b; 19a, 19b and 20a, 20b permits of forming by die-moulding the projecting pipe section 2 as well as the two vent pipes 8a and 8b of the hollow body.

After closing the mould, gas under pressure, for example air, is blown into same through the mandrel tube 22. This air under pressure drives the plastic material which is thus pinched between the edges of partitions 17a and 17b, whereby this material will take the shape of the grooves 18a and 18b and thus form the pipe section 3

embedded in the bottle 1. The air under pressure subsequently penetrates into the cavities 15a, 15b and 16a, 16b and forces the plastic material against the mould walls, thus giving the desired shape to the bottle. It will be seen that the die-moulding of the embedded pipe section 3 is produced by the compressed air issuing from the tube 22, instead of from the mandrel as in the case of the projecting pipe section 2 on the one hand, and vent pipes 8a, 8b, on the other hand.

Of course, the rods 24 and 25 could be replaced by pipes connected like the tube 22 to the air-pressure tube 23. On the other hand, the rods 24 and 25, or the pipes substituted therefor, if any, may have any desired and suitable diameter, for example equal to or greater than that of tube 22.

The hollow body illustrated in FIGURE 1 comprises a projecting pipe section 2 and an embedded pipe section 3, both of which are rectilinear and in relative axial alignment. However, this specific arrangement is not compulsory. In fact, we have seen that the tube 22 of mandrel 21 serves the only purpose of extruding the projecting pipe section 2, the embedded pipe section 3 being extruded by the air under pressure delivered through the tube 22. Therefore, the use of a pipe rectilinear from end to end is not compulsory as it should be in case the extruding step were carried out by means of a rigid duct or a rigid rod extending throughout the suction pipe, that is, its projecting section 2 and its embedded section 3.

The edges of partitions 17a and 17b, instead of being level with the faces 11a and 11b of the half-moulds or shells, as shown, may be disposed differently; thus, any desired and suitable inclination may be imparted to these edges provided that it is consistent with the dimensions of the mould cavity 12a (FIGURE 2), so that in this case the pipe section embedded in the bottle be somewhat inclined with respect to the projecting pipe section.

FIGURES 5, 6 and 7 illustrate modified forms of embodiment of the hollow body of this invention, the same reference numerals designating corresponding elements of the bottle illustrated in FIGURE 1.

FIGURE 5 shows a bottle similar to that of FIGURE 1 but wherein the embedded pipe section 3 is not in alignment with the projecting pipe section 2 so as to form a certain angle therewith.

This suction pipe shape is obtained by forming the partitions 17a and 17b of the mould with inclined edges as stated hereinabove.

FIGURE 6 illustrates another modification of the suction pipe arrangement wherein both the projecting and embedded sections of the exhaust pipe are bent. In this form of embodiment, there is provided, in addition to this exhaust pipe 2, 3, a neck 46 of relatively large diameter which communicates with one cavity 1a, the other cavity 1b being closed at its upper portion. The purpose of this neck is to facilitate the bottle filling operation.

FIGURE 7 illustrates a third modification of the container which comprises only a single central suction pipe. This container may be filled by creating a preliminary vacuum. Sucking up the liquid content is not attended by any difficulty since the bottle walls are extremely flexible and yield under the atmospheric pressure.

Other forms of embodiment are also possible, for example, a bottle in which the embedded pipe section is outside the wall of the hollow body and provided along said wall.

Still other modifications and variations may be contemplated without departing from the scope of the invention. Thus, for example, the suction or exhaust pipe and the ducts connecting the cavities of the body to the outside may have a cross-sectional contour other than circular, for example oval or hexagonal. Besides, an atomizer could be associated with the projecting section of the exhaust pipe for atomizing the liquid product contained in the bottle or the like by exerting a pressure thereon.

Of course, this invention should not be construed as

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being limited by the forms of embodiment described and illustrated herein which are given only by way of example.

What I claim is:

1. A container comprising a hollow body made of mouldable material, said hollow body having a bottom wall and being formed with at least two recesses welded to each other along at least two parallel weld lines, said recesses extending from the upper portion of said hollow body to a short distance from said bottom wall so as to divide said hollow body into at least two cavities communicating with each other at their lower portions, and an exhaust pipe comprising an outer section projecting from said upper portion of the hollow body and an inner section embedded in said hollow body and formed between said weld lines.

2. A container according to claim 1, wherein said hollow body has the shape of a bottle and said recesses are diametrically opposite.

3. A container according to claim 1, wherein said recesses are outflared whereby the engagement of the user's fingers is facilitated.

4. A container according to claim 1, wherein said inner section of said exhaust pipe is in axial alignment with said outer section.

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5. A container according to claim 1, wherein said inner section and said outer section of said exhaust pipe form a certain angle with each other.

6. A container according to claim 1, wherein said inner section and said outer section of said exhaust pipe comprise at least one bend.

7. A container according to claim 1, wherein at least one of said cavities is provided with a duct adapted to connect said cavity with the atmosphere.

8. A container according to claim 1, wherein each one of said cavities is provided with a duct adapted to connect said cavity with the atmosphere, said ducts being parallel to said outer section of said exhaust pipe.

References Cited

UNITED STATES PATENTS

3,092,275	6/1963	Brunton et al. -----	215-1
3,178,081	4/1965	Adams -----	222-211 X
3,232,495	2/1966	Schneider -----	222-210 X

JOSEPH R. LECLAIR, *Primary Examiner.*

D. F. NORTON, *Assistant Examiner.*