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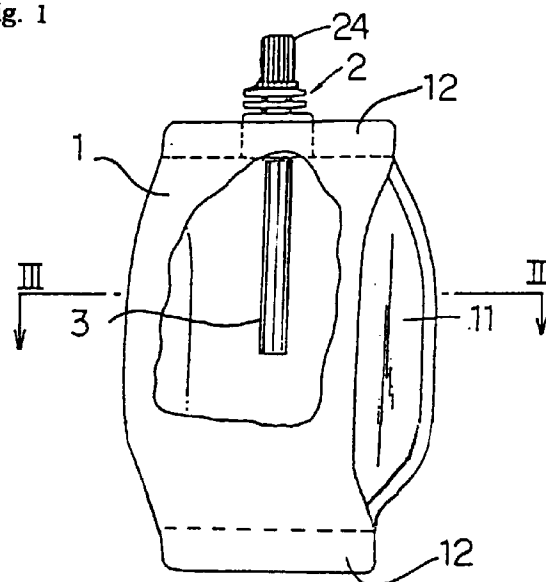
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(54) **FOOD CONTAINER**

(57) A food container (10) comprises a bag-shaped container body (1) formed of a flexible sheet for being filled with a fluid food, a tubular suction port (2) sealed at a sealing side (12) of the container body (1) and capable of communicating to the outside, and a rod-shaped body (3) having a base at the suction port (2) and extending into the container body (1), the rod-shaped body (3) being capable of constructing a suction passageway between it and an inner surface of the container body (1), which passageway communicates with the suction port (1).

Fig. 1



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## Description

### FIELD OF THE ART

[0001] The present invention relates to a food container, and more particularly to a food container to be filled with a juice, a sports drink or generally a fluid food such as a jelly-like favorite food, a soup, a rice gruel, or the like.

### BACKGROUND ART

[0002] Hitherto, a food container is used in which, for example, a bag-shaped container body is formed of a flexible sheet having a core material of aluminum foil and a synthetic resin film laminated on front and rear surfaces thereof and in which a synthetic resin spout (spout) is fixed to block up the opening of the container body. Further, a food container is known in which a straw extending towards the inside of the container body is connected to the spout beforehand to enable a fluid food that fills the container to be sucked from this straw. An opening is formed at the connecting section of the straw and the spout to draw out a remaining food to the spout by tilting the container. This opening is sealed on the inside surface of the container body at the beginning and, when the container is tilted, the inside surface of the container body is separated from the opening to release the sealing, whereby the remaining food can be taken out to the outside of the container without leaving any food.

[0003] In the above-mentioned food container, the opening is formed at the connecting section of the straw and the spout so as to draw out the remaining food from the spout. However, if the opening is large, the inside surface of the container body is separated from the opening to accidentally release the sealing while the container is gripped, thereby making it difficult to suck the food from the lower end of the straw. On the other hand, if the opening is small, it is difficult to take out a food having a comparatively low fluidity, such as a jelly-like favorite, a soup, or a rice gruel.

[0004] Also, a slide pin is inserted and drawn out in a split-cavity mold when the straw extending from the spout is injection-molded using a synthetic resin. A period of time required in cooling the slide pin drawn out from the straw occupies a considerable ratio of the period of time for molding, thereby causing decrease in the molding efficiency.

[0005] A purpose of the present invention is to provide a food container which facilitates a diversified fluid food to be taken out and enables a remaining food to be taken out to the outside of the container without leaving any food, and which has a high molding efficiency.

### DISCLOSURE OF THE INVENTION

[0006] According to the present invention, there is pro-

vided a food container comprising a bag-shaped container formed of a flexible sheet for being filled with a fluid food, a tubular suction port sealed at a sealing portion of the container and capable of communicating to an outside, and a rod-shaped body having a base at the suction port and extending into the container, characterized in that said rod-shaped body is capable of constructing a suction passageway between it and an inner surface of the container, which passageway communicates with said suction port.

[0007] As the flexible sheet in the present invention, it is preferable to use a sheet which is compatible with a food that fills the container, which can be easily discarded and recycled, which is not easily torn by an external force, and which has a moderate shape-retaining property. Specifically, it may be, for example, a flexible sheet made of a core material of aluminum foil on whose front and rear surfaces a synthetic resin film, for example, a film such as polyesters, polyethylenes, polystyrenes, polyvinyl chlorides or stretched nylons, is thermally welded.

[0008] The fluid foods in the present invention include drinks such as juices and sports drinks, fluid foods such as jelly-like favorites, soups, and rice gruels, other portable foods such as space foods and, further, seasonings such as noodle soups, spicy soups and sauces.

[0009] As the bag-shaped container in the present invention, it is preferable to use a container which is molded using a flexible sheet, which is not easily fractured by an external force in a state of being filled with the food, and which contracts and deforms in accordance with the operation of taking out the food. Specifically, it may be, for example, a flat bag generally referred to as an envelope, a gusset bag having gussets on both sides of the bag, a tortoise-shell-bottomed bag having a hexagonal bottom and without a gusset, or a polygon-bottomed bag having a hexagonal bottom with gussets on both sides of the bag. Among these, a gusset bag or a polygon-bottomed bag having gussets on both sides of the bag is preferable.

[0010] The tubular suction port in the present invention is a short tube portion formed in a portion of the bag-shaped container, preferably on the sealing side of the flexible sheet. More preferably, the tubular suction port is a tubular member whose outer periphery is fixed to said sealing side on the inside thereof and whose inner periphery forms a passageway for a food. Its inner diameter is set in accordance with the physical properties and fluidity of the food. It is preferable that, at the suction port, a plug is disposed which seals the food filling the container and which is capable of being opened at the time of taking out the food, and that the plug does not slip out from the suction port easily by an external pressure or an inner pressure of solidification, heat expansion or the like of the food. Specifically, a threaded cap having a return torque of 1.5 kgf or more relative to the suction port is preferable.

[0011] The rod-shaped body in the present invention

is a means that is connected to a lower end of the suction port (an opening end in the container) without blocking the suction port to cooperate with the container body to ensure a passageway between the external surface of the rod-shaped body and the inner surface of the container for drawing out the food that fills the container to the suction port. The cross-sectional shape of the rod-shaped body may be, for example, a circle, an ellipse, a semicircle, a rectangle, a polygon, a sector, a segment, or one of these in which a rib is formed.

[0012] The suction passageway in the present invention refers to a tubular passageway formed between the outer surface of the rod-shaped body and the inner surface of the container against the container body that is contracted and deformed by the operation of taking out the food when the food that fills the container is sucked from the suction port.

[0013] It is preferable that the rod-shaped body comprises a shaft and a group of ribs radially extending from the shaft (or a axis line), and the inner surface of the container abuts ends of adjacent ribs to construct the suction passageway between the two ribs.

[0014] The group of ribs in the present invention acts as a spacer for forming the suction passageway between the external surface of the rod-shaped body and the inner surface of the container against the container body that is contracted and deformed by the operation of taking out the food so as to prevent the inner surface of the container from closely fitting around the shaft of the rod-shaped body when the food that fills the container is sucked from the suction port. The group of ribs is preferably such that a shape connecting the tips of ends of the radially extending ribs forms a polygon.

[0015] Especially, the group of ribs is preferably such that a rib made of a long piece and a rib made of a short piece are disposed perpendicular to each other so that the above-mentioned shape forms a "rhombus". In such a case, the directions of the long piece and the short piece or the ratio of the lengths of these two pieces may be determined in accordance with the aspect ratio in the cross-sectional shape of the bag-shaped container.

[0016] Also, even if the rod-shaped body has a shape like a letter "Λ" or a shape like a letter "I" in which the two ribs are extending in the directions opposite to each other, i.e. made of a flat plate, although these are special shapes, the shape of the rod-shaped body is not limited to the above-mentioned ones as long as the rod-shaped body can form a suction passageway between the specified outer surface of the rod-shaped body and the inner surface of the container by cooperating with the container body, namely, by being disposed in the container in which the contraction and deformation of the container body are oriented beforehand.

[0017] It is preferable that the rib further comprises at least one piece of branched rib branched from its end or from its side or from its end and side.

[0018] The branched rib in the present invention refers to a rib whose base is located away from the shaft of the

rod-shaped body and which is branched in a manner like a "comb-teeth" from the shaft.

[0019] It is preferable that the rod-shaped body acts as a position holding means for holding a position of the suction port in gripping the container, by means of its one end being fixed using the base at the suction port.

[0020] The position holding means in the present invention refers to a means which supports shape retention of the container by means of the rod-shaped body extending from the suction port into the container and acting as a core material of the container when the container body is gripped, at which time the rod-shaped body fixed in a hand by means of the container guides the position of the suction port fixed to its tip, namely, the direction of the opening, to a direction suitable for suction. This means functions effectively at the time of automatic packaging including the process of filling the container with a food.

[0021] It is preferable that the rod-shaped body forms, at its base, an opening having a size capable of allowing the food enclosed in the container to flow to the suction port when the container is tilted.

[0022] The opening in the present invention refers to an opening formed to draw out the food remaining in the container from the suction port when the container is tilted, specifically, an opening of the suction port at a connecting section (base) of the rod-shaped body and the suction port.

[0023] Now, in the food container according to the present invention, the seal of the suction port is released and the food is sucked from the suction port in taking out the food from the food container in which the food is enclosed in the container. At this time, its inner surfaces are brought into close contact with each other between the suction port and the food by a reduced pressure, and the container body is contracted and deformed to block a site immediately under the suction port. However, the rod-shaped body can prevent the close contact between the inner surfaces of the container against the contraction and deformation of the container body, whereby the suction passageway can be formed between the outer surface of the rod-shaped body and the inner surface of the container. Because of this, the food passes through the suction passageway to be drawn out from the suction port, irrespective of the amount of the remaining food.

[0024] In the case where the rod-shaped body comprises a shaft and a group of ribs radially extending from the shaft (or a axis line) and the inner surface of the container abuts ends of adjacent ribs to construct the suction passageway between the two ribs, the inner surface of the container is prevented from closely fitting around the shaft of the rod-shaped body when the food that fills the container is sucked from the suction port, whereby the suction passageway can be formed, against the container body that is contracted and deformed, between the external surface of the rod-shaped body and the inner surface of the container, namely, among

the two adjacent ribs and the inner surface of the container which is in close contact between the ends of the two ribs in this case.

[0025] In the case where the rib further comprises at least one piece of branched rib branched from its end and/or its side, it is possible to form a planned suction passageway in accordance with the shape of the container or the amount of the food remaining in the container, by cooperating with the container body.

[0026] Further, if a taper is formed in which the rib at its end narrows in a direction towards the tip, a suction passageway having a comparatively small cross section can be formed at the bottom of the container, so that a force of sucking the food reaches the bottom of the container and the food can be sucked by a small sucking force.

[0027] In the case where the rod-shaped body forms a position holding means for holding a position of the suction port in gripping the container, by means of its one end being fixed using the base at the suction port, the rod-shaped body extending from the suction port into the container acts as a core material of the container to support the shape retention of the container when the container body is gripped, at which time the rod-shaped body fixed in the hand by means of the container can guide, in the suction direction, the position of the suction port fixed to its tip.

[0028] In the case where the rod-shaped body forms at its base an opening having a size capable of allowing a food enclosed in the container to flow to the suction port when the container is tilted, the food remaining in the container can be drawn out to the suction port when the container is tilted.

#### BRIEF EXPLANATION OF THE DRAWINGS

[0029] Fig. 1 is a perspective view (partially including a cut view) of a food container according to one embodiment of the present invention; Fig. 2 is a front view showing a tubular suction port and a rod-shaped body of the food container of Fig. 1; Fig. 3 is a cross-sectional view along the III-III line of Fig. 1 (when it is filled with a food); Fig. 4 is a cross-sectional view along the III-III line of Fig. 1 (when the food is taken out); Figs. 5 to 11 respectively are enlarged cross-sectional views of rod-shaped bodies according to other embodiments of the present invention; and Fig. 12 is a front view of the rod-shaped body of Fig. 11, omitting a part thereof.

#### BEST MODES FOR REDUCING THE INVENTION INTO PRACTICE

[0030] Next, embodiments of the present invention will be explained on the basis of the drawings. Figs. 1 to 4 show a food container according to one embodiment of the present invention. A food container 10 comprises a container body 1 formed of a flexible sheet, a tubular suction port 2 sealed at a sealing portion of the con-

tainer body 1 and being capable of communicating to the outside, and a rod-shaped body 3 having a base at the suction port 2 and extending into the container body.

[0031] The container body 1 is a gusset bag having gussets 11 on both sides, and has a flexible structure made of a laminated film of polyester film, aluminum foil, stretched nylon film, and polyethylene film. The tubular suction port 2 is fixed to an upper sealing side 12 of the container body 1. A capacity of the container body 1 can be set within the range of about 0.1 liter to 3 liters.

[0032] The tubular suction port 2 is sealed integrally with the container body 1 in sealing the sealing side 12, and its inner periphery is a tubular member made of a synthetic resin for forming a passageway of a food. As shown in Fig. 2, its outer periphery comprises a connecting section 21 closed on the inside of the upper sealing side 12 and a spout 22 extending upwards from the connecting section 21 with the same inner diameter. The spout 22 has a threaded portion 23, to which a cap 24 can be mounted. The rod-shaped body 3 is thermally welded to a lower end of the connecting section 21.

[0033] The rod-shaped body 3 is set to have a length such that a lower end of the rod-shaped body 3 is positioned near a central portion or below the central portion in a height direction of the container body 1 when the tubular suction port 2 is fixed to the container body 1 at the sealing side 12. As shown in a vertical cross-sectional view of Fig. 3, the rod-shaped body 3 has a group of ribs 31 extending radially in four directions from its shaft (or its axis line) generally with equal angular spacing, and each rib 31 is formed to have generally the same width and thickness along the shaft (equal-piece cross). Ends 32 of adjacent ribs are constructed to be capable of abutting an inner surface of the container body 1 to form a suction passageway between the two ribs 31 when the container body 1 is contracted and deformed.

[0034] Here, the diameter of the rod-shaped body 3 (the maximum diameter including the tip of the rib 31) can be set within the range of about 5 mm to 30 mm in accordance with a thickness of the container body 1 when the container body is filled with the food. If said diameter is set to be 10 mm, an average thickness of the rib 31 can be set within the range of about 1 mm to 3 mm, so that the width of the rib 31 in the radial direction is about 3.5 mm to 4.5 mm.

[0035] The length of the rod-shaped body 3 can be set within the range of about 30 mm to 300 mm in accordance with the height of the container body 1. The rod-shaped body 3 can be constructed so that its lower end abuts a bottom surface (bottom side) on the inside of the container body 1 when it is filled with the food. However, the distance between the two is arbitrarily set in accordance with the shape and flexibility of the container body 1.

[0036] An upper end (base) of the rod-shaped body 3 is inserted into the inner peripheral part of the connecting section 21 by means of an upper end portion of the

ends 32 of the ribs 31, whereby upper openings 4 are formed in which a surface perpendicular to the shaft is divided into four portions by means of the group of ribs 31 between a lower opening edge portion 25 of the connecting section 21 and the shaft of the rod-shaped body 3. These upper openings 4 are each formed to have a size capable of allowing the food enclosed in the container to flow to the spout 22 when the container is tilted, thereby facilitating a food having a comparatively low fluidity to be taken out.

**[0037]** A method of use and an action of the container body 1 is explained. In taking out from the container 10 the food which has been previously introduced from the spout 22, the cap 24 is dismounted first. Since the cap 24 is constructed to be released by a return torque exceeding 1.5 kgf between it and the threaded portion 23, the introduced food does not leak out of the container 10 easily. When the food is sucked from the spout 22, the inner surfaces of the container body 1 approach each other between the lower opening edge portion 25 of the connecting section 21 and the liquid level of the food according as the liquid level of the food lowers, whereby the container body 1 is contracted and deformed in a direction that narrows the food suction passageway formed immediately under the upper opening 4. Here, the rod-shaped body 3 prevents the close contact between the inner surfaces against the contraction and deformation of the container body 1, whereby the suction passageway (not shown) can be ensured between the outer surfaces of the rod-shaped body, i.e. the ends 32 of the ribs 31, and the inner surfaces of the container body 1.

**[0038]** Even if the amount remaining in the container body 1 further decreases to contract and deform the container body 1 as shown in Fig. 4, the inner surfaces of the container body 1 abut the ends 32 of adjacent ribs 31 at the lower portion of the ends 32 of the ribs 31, whereby the suction passageway A can be constructed between the two ribs 31. Therefore, the food passes through this suction passageway to be drawn out to the suction port irrespective of the amount of the food remaining in the container.

**[0039]** If the amount remaining in the container body 1 has become too small to reach the lower end of the rod-shaped body 3, the food can be taken out by gravity-drop from the upper opening 4 formed between the lower opening edge portion 25 of the connecting section 21 and the shaft of the rod-shaped body 3 by tilting the container 10. Since the suction is not affected even if the upper opening 4 is opened in a larger size than a conventional one, the food having a comparatively low fluidity can be taken out easily. In discarding a used container 10, the container body 1 can be wound around the rod-shaped body 3 to reduce its volume, so that the disposal is easy.

**[0040]** Here, in the above-mentioned rod-shaped body 3, the ribs 31 are formed in an equal-piece cross, namely, adjacent ribs 31 are formed to have approxi-

mately the same width along the shaft. However, the adjacent ribs 31 may be ribs having a shape of an unequal-piece cross including a long piece and a short piece (See Fig. 11). If the long piece is disposed to conform to the extending direction of the sealing side 12 of the container body 1, a suction passageway in accordance with the contraction and deformation of the container body 1 can be formed.

**[0041]** Figs. 5 to 11 illustrate other embodiments 51 to 57 of the rod-shaped bodies 3 which are usable for a food container according to the present invention, in cross-sectional shapes at the center in their respective longitudinal directions. The embodiments 51 to 57 illustrate an "I" letter shape, a sector, a six-piece radial shape, an "H" letter shape, an unequal-piece cross and parallel ribs, an "I" letter shape and an "H" letter shape, and an unequal-piece cross, respectively in this order.

**[0042]** The above-mentioned rod-shaped body is inserted and bonded to the inner peripheral part of the connecting section 21 by means of the upper end portion (base) of the end of each rib at the time of manufacture. In order to increase the close contact with the inner peripheral surface of the connecting portion 21, the portion to be inserted into the inner peripheral part of the connecting section 21 can have a construction different from the main body of the rod-shaped body located therebelow. Specifically, as embodiments thereof, for example, with respect to the rod-shaped body 3, the portion to be inserted is transformed into a rod-shaped body 53 (Fig. 7); in the case of a rod-shaped body 52 (Fig. 6), the portion to be inserted is transformed into the one obtained by adding a rod-shaped body 51 (Fig. 5) to the center of the inner surface of the sector; in the case of a rod-shaped body 54 (Fig. 8), the portion to be inserted is transformed into a rod-shaped body 56 (Fig. 10); and in the case of a rod-shaped body 57 (Fig. 11), the portion to be inserted is transformed into the rod-shaped body 3 (Fig. 3). The above-mentioned portion to be inserted is connected to the main body of the rod-shaped body by integral molding or by separate bonding. This enables to obtain a firm bonding state by increasing the area of contact of the connecting section 21 onto the inner peripheral part.

**[0043]** Fig. 12 is a front view of the rod-shaped body 57 of Fig. 11, omitting a part thereof. Fig. 12 shows an example in which the above-mentioned rib of the rod-shaped body 3 or the rod-shaped body 57 has a taper (a view corresponding to Fig. 2). In other words, the rod-shaped body 58 includes a taper formed in a pair of axially symmetric ribs so that the rod-shaped body narrows towards a tip. Such a taper formed in the ribs makes it possible to suck the food with more certainty by disposing the long piece in parallel with the sealing side of the container body. Also, since a draft of the mold at the time of molding the rod-shaped body is formed, the molding is facilitated. The taper may be formed in all of the ribs extending from the shaft, for example, in all of the four ribs.

## INDUSTRIAL APPLICABILITY

[0044] Since the present invention is constructed in such a manner that the rod-shaped body extends from the spout into the food container instead of the straw extending from the spout into the food container in the prior art, cooling of the slide pin at the time of molding the straw is facilitated, so that as a result the cooling time is shortened, whereby the period of time is shortened to 30 seconds or less per one shot, instead of one minute that was required.

[0045] As shown above, in the food container according to the present invention, the rod-shaped body can inhibit the close contact between the inner surfaces of the container body against the contraction and deformation of the container body in taking out the food from the food container in which the food is enclosed in the container, whereby the suction passageway can be formed between the outer surface of the rod-shaped body and the inner surface of the container body. Because of this, the food can pass through the suction passageway to be drawn out from the suction port, irrespective of the amount of food remaining in the container.

[0046] In the case where the rod-shaped body comprises a shaft and a group of ribs radially extending from the shaft or a axis line and the inner surface of the container abuts ends of adjacent ribs to construct the suction passageway between the two ribs, the inner surface of the container is inhibited from closely fitting around the shaft of the rod-shaped body when the food that fills the container is sucked from the suction port, whereby the suction passageway can be formed, against the container body that is contracted and deformed, between the external surface of the rod-shaped body and the inner surface of the container, namely, among the two adjacent ribs and the inner surface of the container which is in close contact between the two ends of the ribs. In the case where the rib further comprises at least one piece of branched rib branched from its end and/or its side, it is possible to form an intentional suction passageway in accordance with the shape of the container or the amount of the food remaining in the container, by cooperating with the container body.

[0047] In the case where the rod-shaped body forms a position holding means for holding a position of the suction port in gripping the container, by means of its one end being fixed using the base at the suction port, the rod-shaped body extending from the suction port into the container acts as a core material of the container to support the shape retention of the container when the container body is gripped, at which time the rod-shaped body fixed in the hand by means of the container can guide, in the suction direction, the position of the suction port fixed to its tip.

[0048] In the case where the rod-shaped body forms at its base an opening having a size capable of allowing a food enclosed in the container to flow to the suction port when the container is tilted, the food remaining in

the container can be drawn out to the suction port when the container is tilted.

[0049] According to the present invention, it is possible to provide a food container which facilitates a diversified fluid food to be taken out and enables a remaining food to be taken out to the outside of the container without leaving any food, and which has a high molding efficiency.

[0050] Here, ten pieces of test bodies in which container bodies 1 each including a rod-shaped body 3 connected to a lower portion of a spout 22 were filled respectively with a fruit juice drink and a jelly-like food (each 200 g) were prepared as shown specifically in Figs. 1 to 4, and ten adult persons tried each of the test pieces. The result was that all the ten members could suck the drink and the food, leaving little in the container bodies 1. Also, the passageway for suction of the food was not blocked up at the time of suction. Here, the rod-shaped body 3 was one with its length being 80 mm, its diameter being 10 mm, its average thickness of the rib 31 being 2 mm, and its width of the rib 31 in the radial direction being 4mm.

## Claims

1. A food container comprising a bag-shaped container formed of a flexible sheet for being filled with a fluid food, a tubular suction port sealed at a sealing portion of the container and capable of communicating to an outside, and a rod-shaped body having a base at the suction port and extending into the container, characterized in that said rod-shaped body is capable of constructing a suction passageway between it and an inner surface of the container, which passageway communicates with said suction port.
2. A food container according to claim 1, wherein the rod-shaped body comprises a shaft and a group of ribs radially extending from the shaft, and the inner surface of the container abuts ends of adjacent ribs to construct the suction passageway between the two ribs.
3. A food container according to claim 2, wherein the rib further comprises at least one piece of branched rib branched from its end and/or its side.
4. A food container according to claim 1, wherein the rod-shaped body acts as a position holding means for holding a position of the suction port in gripping the container, by means of its one end being fixed using the base at the suction port.
5. A food container according to claim 1, wherein the rod-shaped body forms, at its base, an opening having a size capable of allowing the food enclosed in the container to flow to the suction port when the

container is tilted.

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Fig. 1

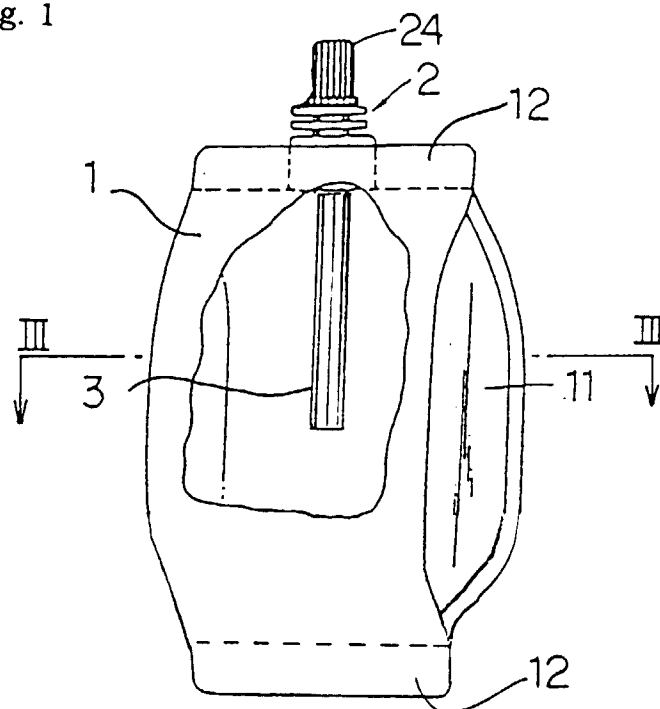


Fig. 2

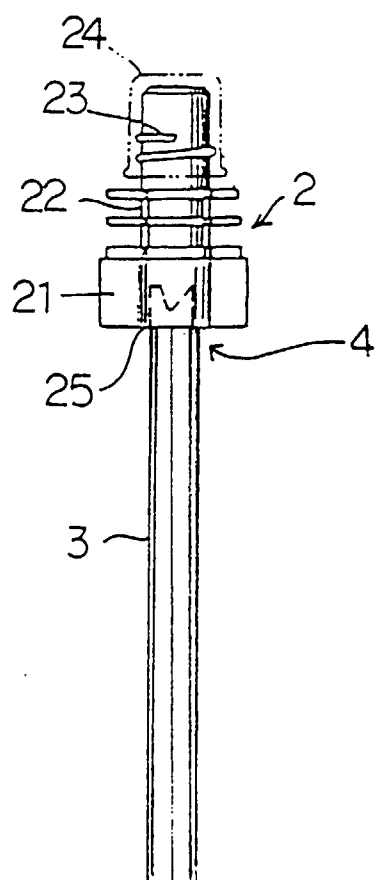




Fig. 3

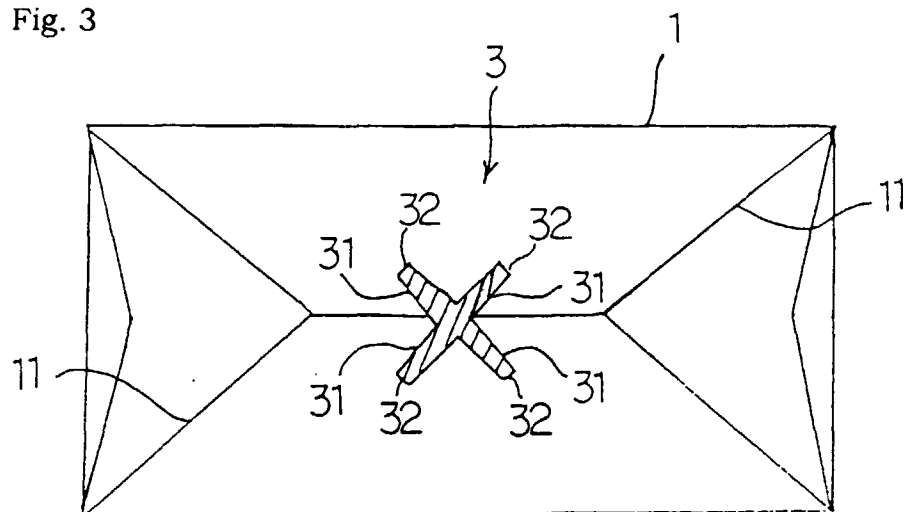


Fig. 4

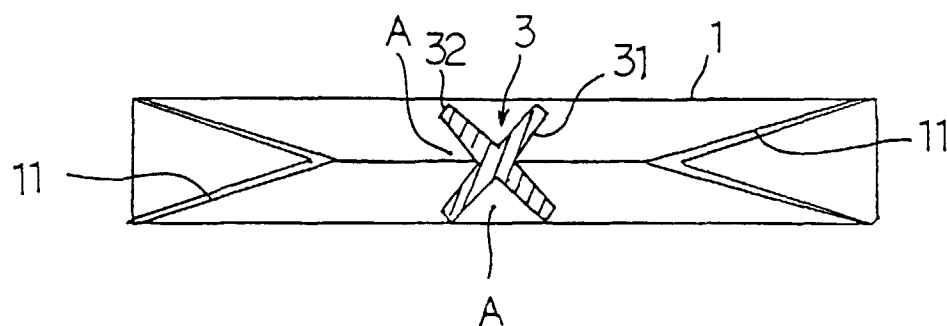


Fig. 5

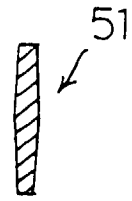


Fig. 6

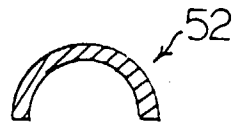


Fig. 7

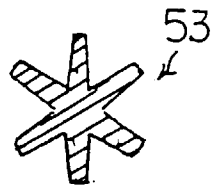


Fig. 8

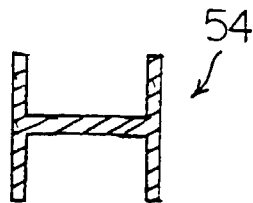


Fig. 9

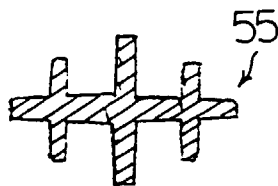


Fig. 10

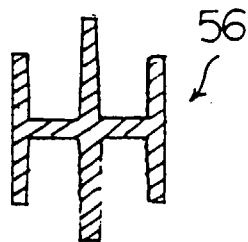


Fig. 11

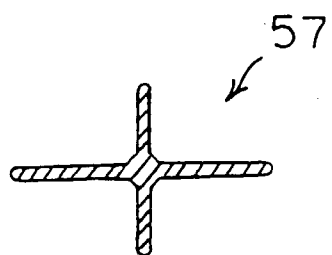
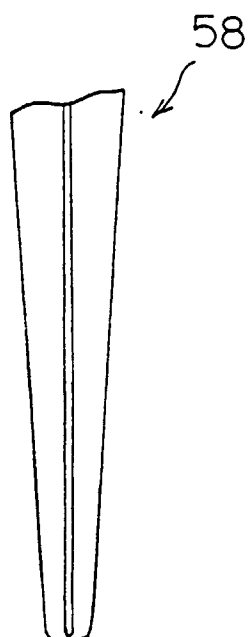


Fig. 12



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP97/02321

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> Int. Cl <sup>6</sup> B65D33/36 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) Int. Cl <sup>6</sup> B65D33/36, 33/38 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1926 - 1997 Kokai Jitsuyo Shinan Koho 1971 - 1997 Toroku Jitsuyo Shinan Koho 1994 - 1997 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP, 5-26845, U (Nippon Kimu K.K.), April 6, 1993 (06. 04. 93) (Family: none)	1 - 5
X	JP, 63-76653, U (Nippon Kimu K.K.), May 21, 1988 (21. 05. 88) (Family: none)	1 - 5
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search July 30, 1997 (30. 07. 97)		Date of mailing of the international search report August 12, 1997 (12. 08. 97)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.		Authorized officer Telephone No.

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