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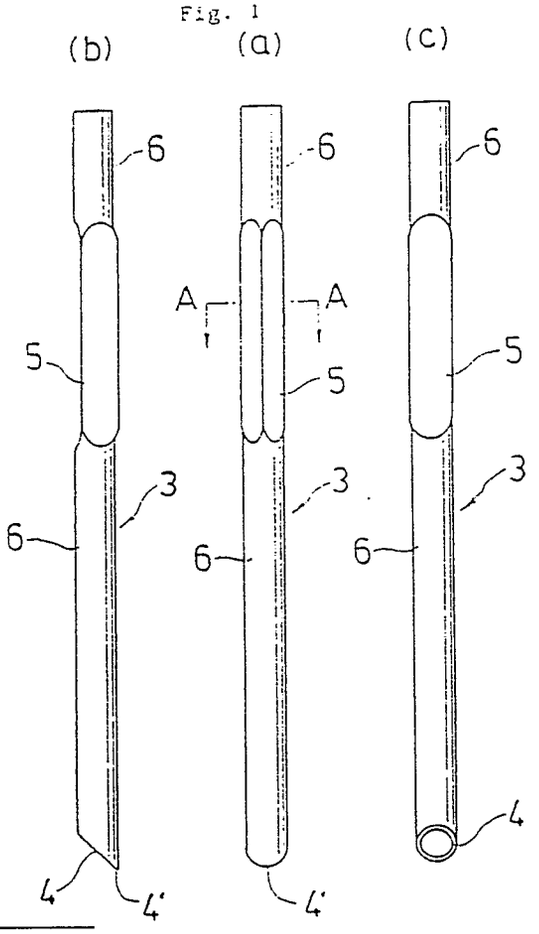
(54) Straw for beverage.

(57) The body of a straw for drinking beverage is generally formed with a circular cross-section but at a specified distance from the portion of said straw it is formed with a polygonal cross section over a suitable distance so that the section of the straw having said polygonal design extends through a circular opening of a paper container when the straw is inserted therein.

Fig. 1



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Straw for Beverage

Background of the invention

Field of the invention

The present invention relates to a straw for beverage for drinking liquid beverage by inserting the straw into the straw inserting opening of a paper container in which the liquid beverage is sealed and more particularly to a straw for drinking beverage wherein an air passage is formed in the straw inserting opening for balancing internal and external pressure of the container when the straw is inserted into the container.

Desription Of The Prior Art

Conventionally, when a straw for a paper container in which liquid beverage such as milk and juice is sealed, is inserted into the straw inserting opening of the paper container to suck and drink the beverage, the internal pressure over the liquid surface inside the closed container reduces when the liquid quantity in the container is reduced as the liquid is sucked and drunk. Therefore, the outer wall of the paper container is caved in and deformed, simultaneously making it difficult to suck to drink the liquid beverage in the container. Under such condition, one has to frequently discontinue sucking to drink the liquid beverage each time such deformation occurs and such condition could not be avoided. In a straw which is improved of the above problem, there is a straw wherein a groove is concavely provided in the outer wall portion of the straw which comes in sliding contact with the sealing film of the straw inserting opening of the container so as to form an air passage in the straw inserting opening, thereby causing the internal and external pressure of the container to balance while sucking to drink the liquid beverage (for example, refer to officialgazette of Japanese Laid-Open Utility Model No. 61-113681 (1986) and Japanese Laid-Open Utility Model No. 61-149575 (1986).

As stated above, any straw for drinking beverage which is formed with an air passage to balance the internal and external pressure of the container during sucking to drink beverage is partially provided with a groove concavely on the outer wall of the straw and it was necessary to process under pressure a fine groove in a straw of small diameter normally made of synthetic resin. This involved a difficulty in finishing and a problem of spoiled external appearance of the straw.

Summary of the invention

The present invention is accomplished in consideration of the above problems, and an object of the present invention is to provide a straw with high value as a merchandise in which the above-described air passage can be processed with better finish and an appearance in good balance as well so that it is possible to form an air passage of this type.

In order to attain the above object, when a straw according to the present design is inserted into a paper container, a square cylinder portion is formed in the longitudinal direction of the straw at a specified distance from the front end portion of the straw where the straw comes in sliding contact with the sealing film thereof, in which the cross section of the square cylinder portion in the orthogonal direction with respect to the axial line of the straw is a polygon having a small number of sides and the length of the outer periphery thereof is the length of the outer periphery of the body of the straw.

It is effective that the polygon formed by the cross section of the above-described square cylinder portion is a regular triangle due to the reasons to be stated later.

It is also desirable, in forming the polygon, to cause one end of the edge of the regular triangle of the cross section of the square cylinder portion to position on the tip of the diagonal end portion which is formed by diagonally cutting the front end of the straw.

It is also possible to form the polygon of the cross section of the square cylinder portion as a square, and in this case, it is recommended that the square is made into a rhombus and that one end of the edge portion of the short diagonal line be caused to position on the tip of the diagonal end portion of the straw. It is advantageous, when using the straw, to form the circumferential wall in the expanded diameter portion which is on the opposite side of the front end portion of the straw with the square cylinder portion being disposed between the front end portion and the opposite side of the straw.

Operation of the Invention

In a straw having the above constitution, when the straw is used by inserting it into the sealing film of the straw inserting opening of the paper container in which liquid beverage is sealed, the broken pieces of the sealing film which comes in

sliding contact with the circumferential wall portion of the body of the straw after the sealing film is broken through by the front end portion of the straw when the straw is held for sucking to drink beverage at the square cylinder portion, substantial portion of the inner edge of such broken pieces of the sealing film remain as the residue which is almost circular and are attached to the straw inserting opening. This phenomenon is remarkable in the case of a straw whose front end portion is cut diagonally. At the square cylinder portion of a polygon with a small number of sides, the gap between the straw and the inner edge of the circular residue of the broken pieces of the sealing film attached to the straw inserting opening becomes large in which even if large residual broken pieces of the sealing film attaching to the straw inserting opening exist, the gap is blocked only in part thereof, so that the air passage can be maintained by the gap of other broken sealing films thereby to balance the pressure inside and outside of the container while sucking to drink beverage.

Further, in a regular polygon having the same circumferential length in the cross section of the square cylinder portion, the area becomes the smallest in the case of a regular triangle. Therefore, the gap becomes maximum so as to enable to form a large air passage. If in this case one end of the edge portion of a regular quadrangle is caused to position on the tip of the diagonal end portion of the straw, two gaps of the inner edge of the residual broken pieces of the sealing film can be positioned on the side of the tip where circular arc residual broken pieces is likely to be formed thereby efficiently forming the air passage.

If the polygon of the cross section of the square cylinder portion is made a square, generally the area of the cross section of the same circumferential length is larger than the area of a triangular, and the area for sucking to drink beverage can be made greater even if the gap becomes small. If the square is made a rhombus and one end of the edge of the short diagonal line thereof is caused to position on the side of the tip of the diagonal end portion of the straw, the area for sucking to drink beverage can be made at least smaller than that of a regular square, that is, the gap can be made larger, so that the area for sucking to drink beverage can be made larger though the gap becomes smaller than that of the regular triangle.

Furthermore, if the circumferential wall of the straw on the opposite side of the front end portion of the straw is made an expanded diameter portion with the square cylinder portion disposed between the front end portion and the circumferential wall of the straw, it becomes possible to

Brief Description of the drawings

Embodiments of the present invention will be described with reference to the accompanying drawings.

Fig. 1 through Fig. 5 show the first embodiment, Fig. 4 also shows the using condition of other embodiments, Fig. 6 through Fig. 8 show the second embodiment, Fig. 9 and Fig. 10 show the third embodiment.

Fig. 1 (a), (b), and (c) are the front view, side view, and rear view respectively of the straw of tho first embodiment.

Fig. 2 is a sectional view of the line A - A shown in Fig. 1 (a).

Fig. 3 is a perspective view showing the using condition of the straw of Fig. 1.

Fig. 4 is a diagram showing the state wherein the sealing film of the straw inserting opening is broken through by the diagonal end portion of the straw of the first through third embodiments.

Fig. 5 is a sectional plan view of the square cylinder portion showning the formation of an air passage when the straw of the first embodiment is in use.

Fig. 6 (a), (b), and (c) are the front view, side view, and rear view respectively of the straw of the second embodiment.

Fig. 7 is a sectional view of the line B - B shown in Fig. 6 (a).

Fig. 8 is a sectional plan view of the square cylinder portion showing the formation of an air passage when the straw of the second embodiment is in use.

Fig. 9 is a plan view of the third embodiment.

Fig. 10 is a plan view of the straw shown in Fig. 9.

Detailed Description of the drawings

The straw (3) is manufactured by partially forming under pressure a tube of a specified length and a specified diameter consisting of materials such as polypropylene and polythylene, and the front end portion of the straw (3) is cut diagonally to form a diagonal end portion (4). When a straw for drinking beverage is inserted into a position from a specified distance over a specified length in the longitudinal direction from the tip (4′) of the diagonal end portion (4), that is, into the straw inserting opening of a paper container in which liquid beverage is sealed, the circumferential wall (6) of the straw (3) is formed under pressure so as to form the square cylinder portion (5) over a

section where the straw disposed for sucking to drink beverage comes in sliding contact with the broken sealing film of the straw inserting opening, so that the section (cross section) in the diagonal direction with respect to the axial line of the straw (3) is made a regular triangle and further that one end of the edge portion of the regular triangle is positioned on the side of the tip (4′) of the diagonal end portion (4) of the straw (3). In this case, because the cross section is formed into a regular triangle by forming under pressure so that the length of the outer periphery of the regular triangle is formed to have the same length of the outer periphery o the circumferential wall (6) of the straw whose section is circular, and because the cross sectional area of the hollow regular triangle which is the drinking portion can maintain about little over 60% of the cross sectional area of the circular portion, there is no problem that occurs in practical sucking of beverage. Fig. 2 is the cross section of the line (A) - (A) of the straw (3) shown in Fig. 1 (a), and shows the relation wherein the circumferential wall (6) and the cross section is the square cylinder portion (5) of the regular triangle.

Fig. 3 is a perspective view show ing the using condition of the straw (3) which is a first embodiment having the square cylinder portion (5) whose cross section is a regular triangle, wherein the straw (3) is inserted into the straw inserting opening (2) of the paper container in which liquid beverage is sealed. When inserting the straw into the paper container (1) by breaking through the sealing film (8) of the straw inserting opening (2) provided on the upper wall (1a) of the paper container (1) by the tip (4′) of the diagonal end portion of the straw (3) (refer to Fig. 4), during the initial stage the tip (4′) of the diagonal end portion (4) butts against the sealing film (8), the edge of the sealing film (8) is broken sequentially into almost circular arcs by the tip portion (4′) butting against the sealing film (8) at an acute angle so that small broken edges (8′) are formed to remain at the straw inserting opening (2) and the end edge of the base of the diagonal end portion (4) butts against a portion close to the obtuse angle portion so that the portion of the sealing film (8) to be broken lastly becomes relatively large broken edge (8″) to remain attached to the straw inserting opening (refer to Fig. 4). There is a very high probability that such relatively large broken edge is formed to remain with the straw inserting opening.

For this reason, when the square cylinder portion (5) of the straw (3) has reached the straw inserting opening (2), between the side wall (5a) of the square cylinder portion (5) and the inner edge of the straw inserting opening, there is formed a pair of air passages (7) between the two side walls (5a) and the broken edges (8′) which are positioned on the side of the tip (4′) of the straw as shown in Fig. 5 (refer to Fig. 5). By this arrangement, the pressure inside and outside of the container is balanced and smooth sucking and drinking of beverage becomes possible.

Fig. 6 through Fig. 8 show a second embodiment and Fig. 6 (a), (b), and (c) are the front view, side view, and rear view respectively of the straw of the embodiment of the invention. In this embodiment, the square cylinder portion (5) whose cross section is a regular triangle shown in the first embodiment is formed into a rhombus whose angle of the corner of thc acute angle is 60 degrees. In forming this square cylinder portion (5), one end of the edge (whose angle is 120 degrees) of the short diagonal line of the rhombus is formed under pressure to as to position on the side of the tip (4′) of the diagonal end portion (4) of the straw. In this case, because the length of the outer periphery of the rhombus is formed under pressure to be almost the same length of the outer periphery of the circumferential wall (6) of the straw whose cross section is circular, the cross sectional area of the hollow rhombus portion, which is the sucking and drinking portion of the container, can maintain about 60% of the cross sectional area of the circular portion. There is no practical problem in drinking beverage from the container. Fig. 7 is a sectional drawing of the line B - B of the straw (3) shown in Fig. 6 (a) and indicates the relation between the circumferential wall (6) and the square cylinder portion (5) of the cross section of the rhombus. When this straw is used by inserting it into the straw inserting opening (2) on the upper wall (1a) of the paper container in the same manner wherein the straw (3) having the square cylinder portion (5) whose above described cross section is a regular triangle, there remains relatively small broken edges (8′) of the sealing film on the side of the tip (4′) of the diagonal end portion (4) of the straw in the straw inserting opening (2) while there remains relatively large broken edges (8″) of the sealing film on the rear of the sealing film which is close to the base of the diagonal end portion (4) of the straw and to be broken lastly (refer to Fig. 4). Therefore, when the square cylinder portion (5) of the rhombus of the straw has reached the straw inserting opening (2), between the side wall (5a) of the square cylinder portion (5) and the inner edge of the straw inserting portion (2), there is formed the crescent--shaped air passage (7) between the two side walls (5a) and the broken edges (8′) which are positioned on the the side of the tip (4′) of the straw as shown in Fig. 8.

By this arrangement, likewise the above-mentioned embodiments, the external air flows into the container as the beverage in the container is sucked for drinking thereby enabling smooth drink-

ing. In this case, the area of sucking for drinking is a little greater than that of the case wherein the cross section of the square cylinder portion is a regular triangle.

Fig. 9 and Fig. 10 show the straw of other embodiment, and Fig. 9 is the front view of the straw while Fig. 10 is the plan view of Fig. 9 showing the relation between the inner wall of the square cylinder portion (5) and the side wall (6a) of the suction side of the straw. In this straw, an expanded diameter portion (6a) is formed by expanding the diameter of the circumferential wall (6) on the suction side which is opposite to the diagonal end portion of the straw with the square cylinder portion (5) of the straw (3) whose cross section is a regular triangle of the first embodiment. When this straw is used, it is possible to prevent the straw from falling into the container in case the bottom of the container is deep with respect to the length of the straw.

If the inner diameter portion of the straw inserting opening (2) of the paper container, that is, the exposed sealing film (8), is relatively larger than the straw diameter, it is possible to cause the center of the square cylinder portion (5) to be eccentric on the opposite side of the tip (4′) of the straw from the center of the axis of the straw (3) and to cause one end of the edge of the square cylinder portion (5) to position on the side of the tip (4′) thereby forming a large air passage (7).

As is apparent from the above description, the straw according to the present invention has the following effects as described hereinafter.

In the straw according to claim 1, when drinking beverage through a straw by inserting it into the straw inserting opening of a paper container in which liquid beverage such as milk and juice is sealed, it is possible to form a straw which is capable of balancing the internal and external pressure of the container by means of an air passage formed in the sealing film portion of the straw inserting opening even if the quantity of the liquid beverage is reduced as it is being sucked for drinking, thereby causing no difficulty in drinking the beverage resulting from the caving in of the container. Different from the conventional straw in which an air groove is concavely provided in the circumferential wall thereof, by forming an air passage of the sealing film in the square cylinder portion having a small number of sides, it is possible to provide a straw of this type which has high merchandise value and is well balanced in shape and excellent in appearance.

In the straw according to claim 2, by forming the cross section of the square cylinder portion into a regular triangle, it is possible to provide a straw wherein the regular polygon having the same circumferential length can have a maximum gap (air passage) to be formed in the scaling film portion of the inserting opening.

In the straw according to claim 3, by causing one end of the edge of the regular triangle of the cross section of the square cylinder portion to position on the side of the tip of the straw, it is possible to efficiently form the air passage of the sealing film of the straw inserting opening.

In the straw according to claim 4, by forming the cross section of the square cylinder portion into a square, it is generally possible to increase the cross sectional area of the passage through which beverage is sucked for drinking as compared with the straw whose cross section is a regular triangle.

In the straw according to claim 5, by forming the cross section of the square cylinder portion into a rhombus and by positioning one end of the edge of short diagonal line to be one the side of the tip of the straw, it is possible to provide a straw in which an air passage can be efficiently formed in a square cross section which has a greater cross sectional area of the passage through which beverage is sucked for drinking, as compared with the straw those cross section is a regular triangle.

In the straw according to claim 6, further by forming the circumferential wall of the straw on the suction side of the square cylinder portion into an expanded diameter, it is possible to provide a straw which will not fall into the container while in use.

Claims

1. A straw for drinking beverage used by inserting said straw for beverage into a straw inserting opening (2) of a paper container (1) in which liquid beverage is sealed, wherein at a specified distance from a tip portion (4) of the straw (3) is formed in the longitudinal direction of the straw (3) a square cylinder portion (5) whose cross section in the orthogonal direction with respect to the axial line of the straw (3) is a polygon which has a small number of sides and the length of the outer periphery thereof is almost equal to the length of the outer periphery of the circumferential wall (6) of the straw.

2. A straw for drinking beverage according to claim 1, wherein the polygon of the cross section of the square cylinder portion (5) is a regular triangle.

3. A straw for drinking beverage according to claim 2, wherein one end of the edge of the regular triangle of the cross section of the square cylinder (5) is caused to position at the tip (4′) of the diagonal end portion (4) which is the front end portion of the straw (3).

4. A straw for drinking according to claim 1, wherein the polygon of the cross section of the square cylinder (5) is a square.

5. A straw for drinking beverage according to claim 4, wherein the square of the cross section of the square portion is a rhombus and one end of the edge of the short diagonal line thereof is caused to position on the tip (4′) side of the diagonal end portion (4) which is the front end portion of the straw (3).

6. A straw for drinking beverage according to either of claim 1 through 5, wherein the circumferential wall (6) of the straw (3) which is on the opposite side of the front end portion (4) with the square cylinder portion (5) disposed therebetween is made an expanded diameter portion (6a).

Fig. 1

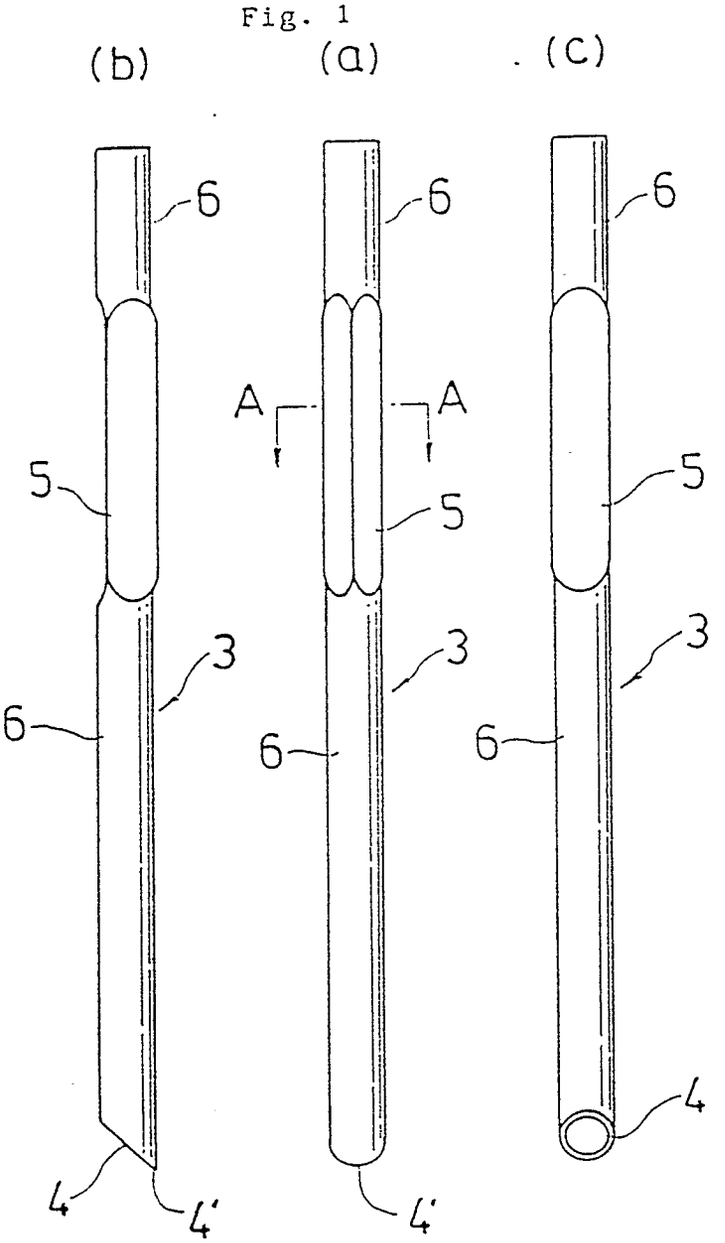

Fig. 2

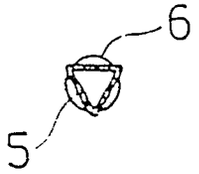

Fig. 3

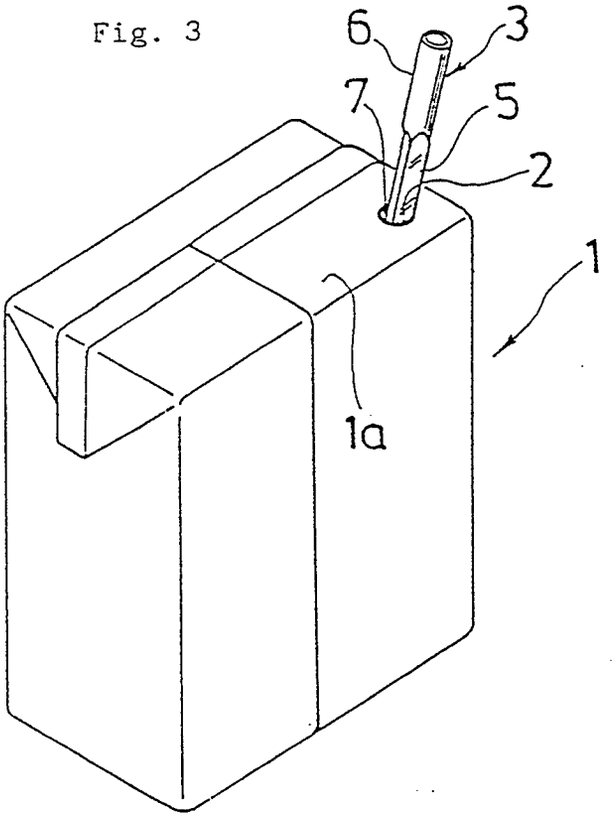

Fig. 4

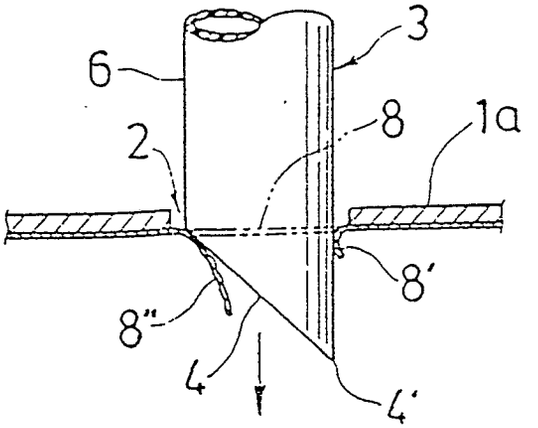

Fig. 5

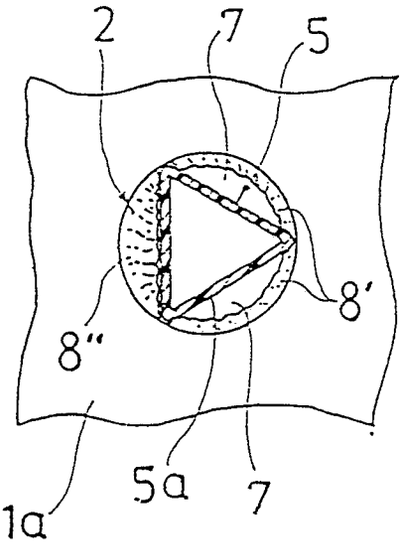

Fig. 6

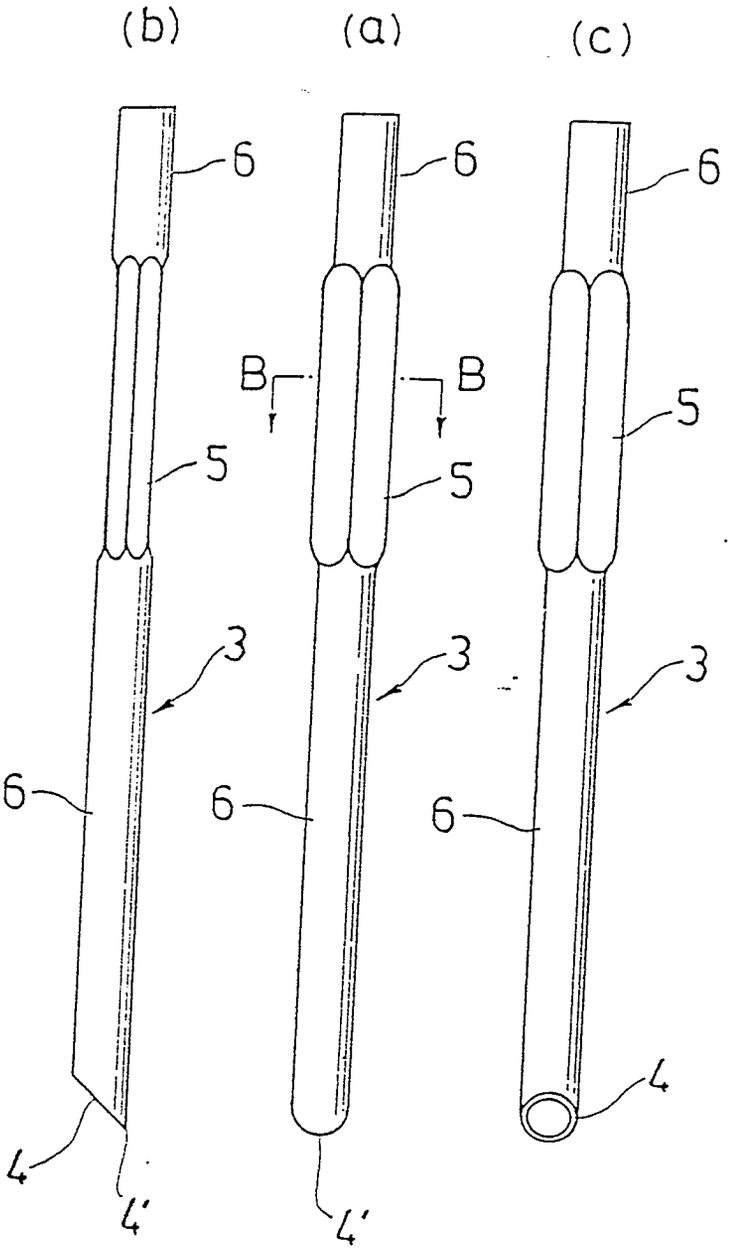

Fig. 10

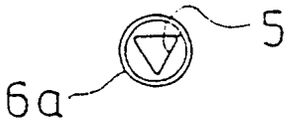

Fig. 7

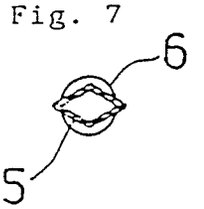

Fig. 9

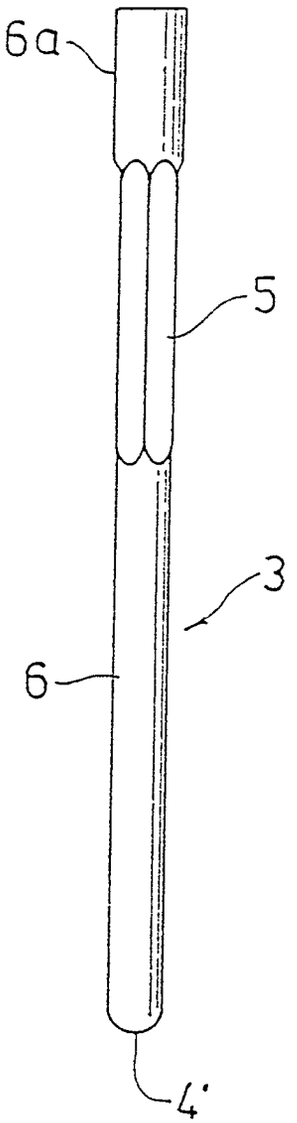

Fig. 8