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(54) **Straw for beverage.**

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Description

Background of the invention

Field of the invention

The present invention relates to a straw for drinking 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.

Description 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 order to avoid the above problem, there is known 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).

In such prior art 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 by being partially provided with a groove concavely on the outer wall of the straw it is necessary to process under pressure a fine groove in a straw of small diameter normally made of synthetic resin. This involves 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 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, in a straw according to the present invention designed to be inserted into a paper container, a polygonal 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, the cross section of the polygonal cylinder portion in the orthogonal direction with respect to the axial line of the straw being a polygon having a small number of sides and the length of the outer periphery thereof being substantially equal to the length of the outer periphery of the body of the straw.

It is particularly effective if the the cross section of the above-described polygonal cylinder portion is a regular triangle due to the reasons to be stated later.

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

It is also possible to form the cross section of the polygonal 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 thereof be positioned on the side of the tip of the diagonal end portion of the straw. It is advantageous, when using the straw, to form the circumferential wall with an enlarged diameter portion which is on the opposite side of the front end portion of the straw with the polygonal cylinder portion being disposed between the front end portion and said 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 come 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 polygonal cylinder portion 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, and therefore even if large residual broken pieces of the sealing film attaching to the straw inserting opening exist, the gap is blocked only partially, so that an air passage can be maintained at the gap thereby to balance the pressure inside and outside of the container while sucking to drink beverage.

Further, for a regular polygon having the same circumferential length at the cross section of the polygonal cylinder portion, the cross-sectional area becomes 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 positioned in line with the tip of the diagonal end portion of the straw, two gaps of tie 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 are likely to be formed, thereby efficiently forming the air passage.

If the the cross section of the polygonal 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 triangle, and the area for sucking to drink beverage can be made greater, whereas the gap becomes smaller. If the square is made a rhombus and one of the edges of the short diagonal line thereof is positioned 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 formed with an expanded diameter portion with the polygonal cylinder portion disposed between the front end portion and the circumferential wall of the straw, it becomes possible to prevent the straw from completely sliding into the container.

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 the 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 polygonal 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 the straw is inserted into a container up to an end position, a portion having a specified length and located at a specified distance in the longitudinal direction from the tip (4') of the diagonal end portion (4) will be positioned in the straw inserting opening of the paper container in which liquid beverage is sealed. In this portion the circumferential wall (6) of the straw (3) is formed under pressure so as to form a polygonal cylinder portion (5) over a length where the straw engages the broken sealing film of the straw inserting opening. In the first embodiment, cross section in a plane orthogonal with respect to the axial line of the straw (3) is made a regular triangle and one of the edges 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 the same as the length of the outer periphery of the circumferential wall (6) of the straw where the section is circular, and because the cross sectional area of the hollow regular triangle is slightly more than 60% of the cross sectional area of the circular portion, no obstruction will occur when sucking the beverage. Fig. 2 is the cross section along line (A) - (A) of the straw (3) shown in Fig. 1 (a), and shows the relation of the circumferential wall (6) and the cross section of the polygonal cylinder portion (5) of regular triangle form.

Fig. 3 is a perspective view showing the use of the straw (3) according to the first embodiment having a polygonal 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) is pressed against the sealing film (8) and the edge of the sealing film (8) is first broken into almost circular arcs by the tip portion (4') pressing 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 subsequently 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) last to be broken forms a relatively large broken edge (8'') which remains 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 polygonal cylinder portion (5) of the straw (3) has reached the straw inserting opening (2), the gap between the side walls (5a) of the polygonal cylinder portion (5) and the inner edge of the straw inserting opening will form 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. 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. In this embodiment, the polygonal cylinder portion (5), whose cross section was a regular triangle in the first embodiment, is now formed into a rhombus whose angle at the acute corners is 60 degrees. In forming this polygonal cylinder portion (5), one of the edges (whose angle is 120 degrees) of the short diagonal line of the rhombus is formed so as to be positioned 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 as formed under pressure is almost the same as the length of the outer periphery of the circumferential wall (6) of the straw where the cross section is circular, the cross sectional area of the hollow rhombus portion can maintain about 60% of the cross sectional area of the circular portion. This presents no problem when drinking beverage from the container.

Fig. 7 is a sectional drawing along line B - B of the straw (3) shown in Fig. 6 (a) and indicates the relation between the circumferential wall (6) and the polygonal cylinder portion (5) formed in cross section as a 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 as described, there remain only 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 remain 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 which is last to be broken (refer to Fig. 4). Therefore, when the polygonal cylinder portion (5) of rhombus shape has reached the straw inserting opening (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 to the above-mentioned first embodiments, the external air flows into the container as the beverage in the container is sucked for drinking thereby enabling smooth drinking. In this case, the area of sucking for drinking is a little greater than that of the first embodiment where the cross section of the polygonal cylinder portion is a regular triangle.

Fig. 9 and Fig. 10 show the straw of another 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 polygonal cylinder portion (5) and the side wall (6a) of the suction side of the straw. In this straw, an enlarged 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 respect to the polygonal cylinder portion (5) of the straw (3) whose cross section is a regular triangle as in 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 deeper than 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 substantially larger than the straw diameter, it is possible to cause the center of the polygonal cylinder portion (5) to be eccentric towards the opposite side of the tip (4') of the straw from the center of the axis of the straw (3) and to have one of the edges of the polygonal cylinder portion (5) positioned 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.

When drinking beverage through the straw by inserting it into the straw inserting opening of a paper container in which liquid beverage such as milk and juice is sealed, the form of the straw makes it 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, while if the quantity of the liquid beverage is reduced as it is being sucked for drinking, thereby avoiding any difficulty in drinking the beverage resulting from the caving in of the container. Different from the prior art 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 polygonal cylinder portion having a small number of sides, it is possible to provide a straw of this type which has a high merchandise value and is well balanced in shape and of attractive in appearance.

By forming the cross section of the polygonal cylinder portion into a regular triangle, it is possible to provide a straw wherein the regular polygon having the sane circumferential length can have a maximum gap (air passage) to be formed in the sealing film portion of the inserting opening.

By having one end of the edge of the regular triangle of the cross section of the polygonal cylinder portion positioned on the side of the tip of the straw, it is possible to efficiently form the air passage in the sealing film of the straw inserting opening.

By forming the cross section of the polygonal 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.

By forming the cross section of the polygonal cylinder portion into a rhombus and by positioning one of the edges of the short diagonal line to be on the side of the tip of the straw, it is possible to provide a straw in which an air passage can be efficiently formed using a polygonal cross section which has a greater cross sectional area for the passage through which beverage is sucked for drinking, as compared with the straw whose cross section is a regular triangle.

Further, by forming the circumferential wall of the straw at the suction side of the polygonal 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 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 polygonal 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 cross section of the polygonal cylinder portion (5) is a regular triangle.

3. A straw for drinking beverage according to claim 2, wherein one of the edges of the regular triangle of the cross section of the polygonal cylinder portion (5) is positioned at the side of the tip (4') of the diagonal tip portion (4) of the straw (3).

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

5. A straw for drinking beverage according to claim 1, wherein the cross section of the polygonal cylinder portion is a rhombus and one end of the edge of the short diagonal line thereof is positioned on the tip (4') side of the diagonal tip end portion (4) 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 tip end portion (4) with the square cylinder portion (5) disposed therebetween has an enlarged diameter portion (6a).

Patentansprüche

1. Trinkhalm zum Trinken eines Getränks, der zum Gebrauch in eine Halmeinstecköffnung (2) eines Papierbehälters (1), in dem ein flüssiges Getränk eingeschlossen ist, einsteckbar ist, wobei an dem Halm (3) in vorgegebenem Abstand von seiner Spitze (4) ein polygonaler Zylinderabschnitt (5) in Längsrichtung des Halms (3) geformt ist, dessen Querschnitt rechtwinklig zur Axiallinie des Halms (3) ein Polygon mit einer kleinen Anzahl von Seiten ist, und dessen äußere Umfangslänge annähernd gleich der äußeren Umfangslänge der Umfangswand (6) des Halmes ist.

2. Trinkhalm nach Anspruch 1,
bei dem der Querschnitt des polygonalen Zylinderabschnitts (5) ein gleichseitiges Dreieck ist.

3. Trinkhalm nach Anspruch 2,
bei dem eine der Kanten des gleichförmigen Dreiecks des Querschnitts des polygonalen Zylinderabschnitts (5) auf der gleichen Seite wie die Spitze (4') des schräg abgeschnittenen Endes (4) des Halmes (3) liegt.

4. Trinkhalm nach Anspruch 1,
bei dem der Querschnitt des polygonalen Zylinderabschnitts (5) ein Quadrat ist.

5. Trinkhalm nach Anspruch 1,
bei dem der Querschnitt des polygonalen Zylinderabschnitts ein Rhombus ist und ein Ende der Kante auf dessen kurzer Diagonalen auf der gleichen Seite wie die Spitze (4') des schräg abgeschnittenen Endes (4) des Halmes (3) angeordnet ist.

6. Trinkhalm nach einem der Ansprüche 1 bis 5,
bei dem die Umfangswand (6) des Halmes (3), die auf der der Spitze (4) abgewandten Seite des polygonalen Zylinderabschnitts (5) liegt, einen im Durchmesser erweiterten Abschnitt (6a) aufweist.

Revendications

1. Paille pour l'absorption de boissons utilisée par introduction de ladite paille dans une ouverture (2) d'introduction de paille d'un récipient de papier (1) dans lequel la boisson liquide est hermétiquement enfermée, dans laquelle à une distance déterminée d'une partie de pointe (4) de la paille (3) est formée dans la direction longitudinale de la paille (3) une partie de cylindre à section polygonale (5) dont la section transversale dans la direction orthogonale par rapport à la ligne axiale de la paille (3) est un polygone qui a un nombre réduit de côtés et dont la longueur de la périphérie extérieure est presque égale à celle de la périphérie extérieure de la paroi circonférencielle (6) de la paille.

2. Paille pour l'absorption de boissons selon la revendication 1, dans laquelle le polygone de la section transversale de la partie de cylindre à section polygonale (5) est un triangle équilatéral.

3. Paille pour l'absorption de boissons selon la revendication 2, dans laquelle une extrémité du bord du triangle équilatéral de la section transversale de la partie de cylindre à section polygonale (5) est amenée à se positionner à la pointe (4') de la partie extrême diagonale (4) qui constitue la partie terminale avant de la paille (3).

4. Paille pour l'absorption de boissons selon la revendication 1, dans laquelle le polygone de la section transversale de la partie de cylindre à section polygonale (5) est un carre.

5. Paille pour l'absorption de boissons selon la revendication 4, dans laquelle le polygone de la section transversale de la partie de cylindre à section polygonale est un losange et une extrémité du côté de la petite diagonale de ce dernier est amenée à se positionner à la pointe (4') de la partie extrême diagonale (4) qui constitue la partie terminale avant de la paille (3).

6. Paille pour l'absorption de boissons selon l'une quelconque des revendications 1 à 5, dans laquelle la partie de la paroi circonférencielle (6) de la paille (3) présente du côté opposé à la partie terminale avant (4), la partie de cylindre à section polygonale (5) étant disposée entre elles, une partie à diamètre élargi (6a).

Fig. 1

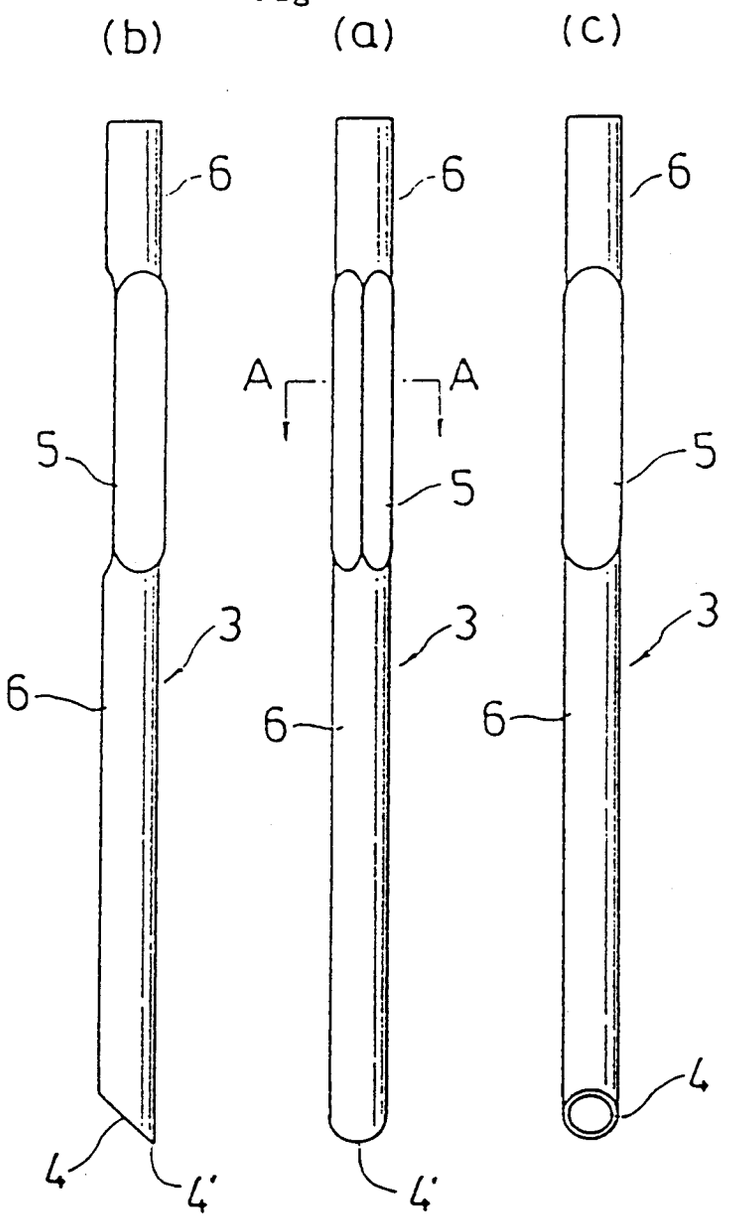

Fig. 2

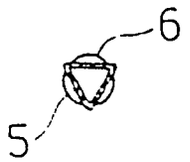

Fig. 3

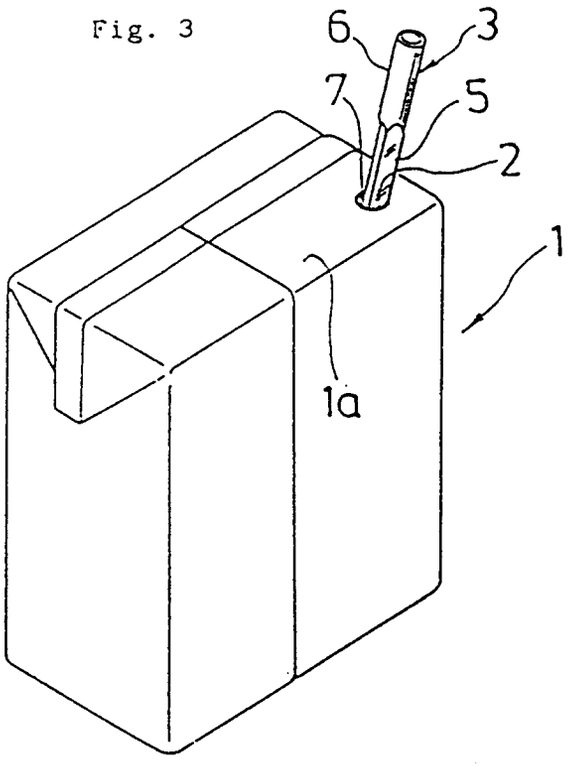

Fig. 4

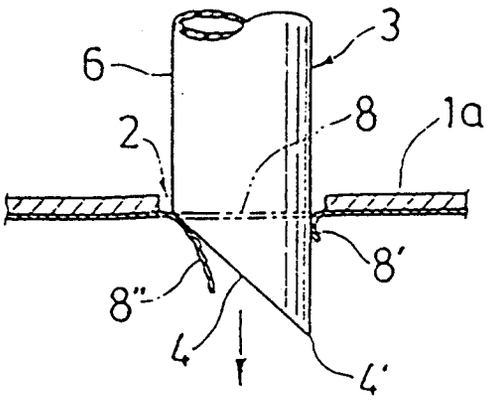

Fig. 5

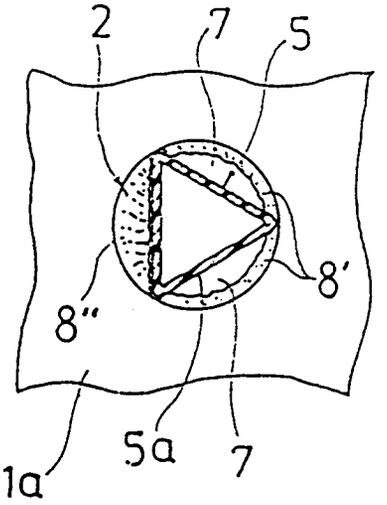

Fig. 6

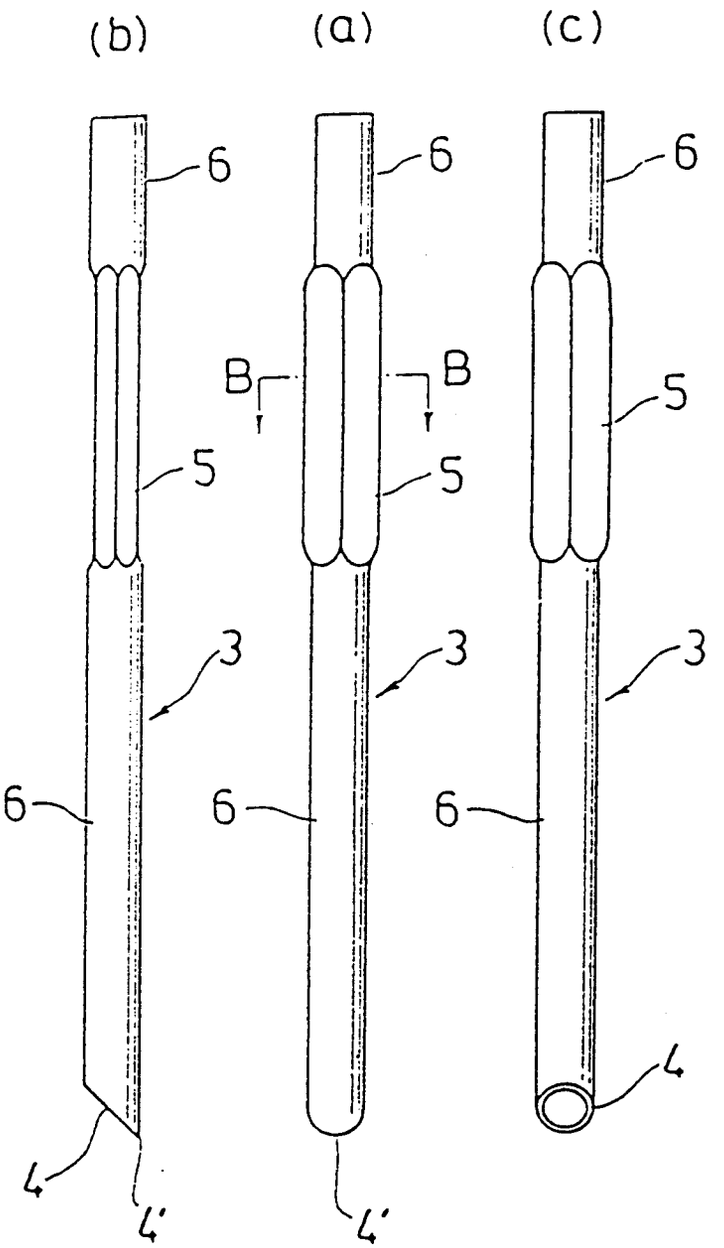

Fig. 10

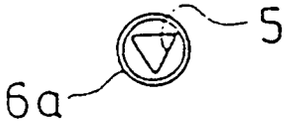

Fig. 7

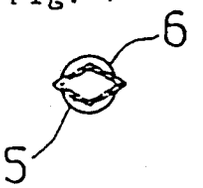

Fig. 9

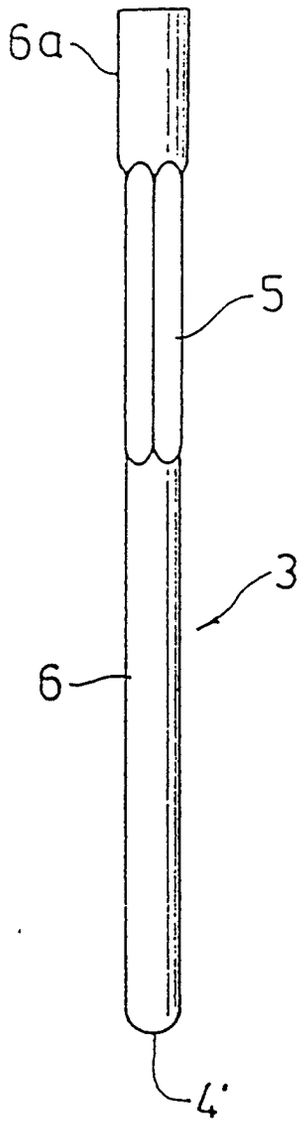

Fig. 8