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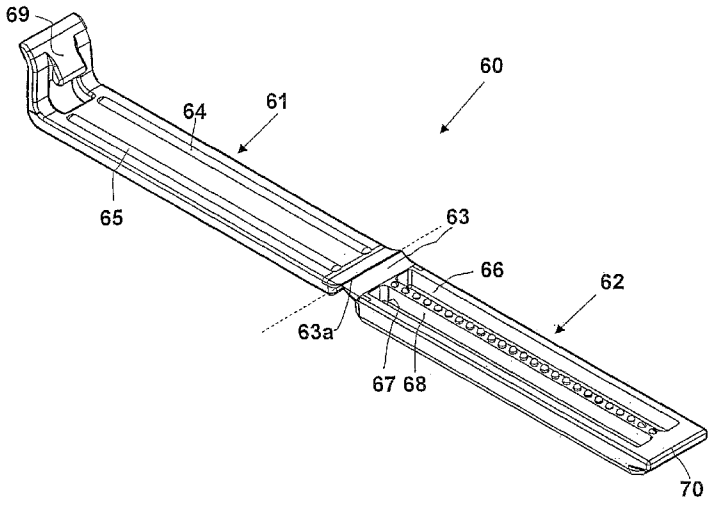
(54) **Title:** AROMA-PRESERVING CLIP DEVICE FOR CLOSING TETRAREX®-TYPE CONTAINERS



(57) **Abstract:** A clip for closing Tetrarex® -type containers for food products, similar to a short bar divided into two parts of equal length, is joined together at a central point of reduced thickness in which there is a crosswise bend acting as a hinge situated on the transversal axis of symmetry. By means of this hinge the clip can take up two positions, one open and one closed. The internal surface of a first of the two halves of the clip contains two longitudinal parallel slightly raised ribs that extend over the full length of said first half. Two longitudinal parallel cavities separated by a partition extend along the whole length of the second half of the clip penetrating to a certain extent into its thickness. At the two free ends of the clip are means for a snap closure in the form of a hook. The border of the partition that separates the two cavities has a discontinuous, button covered, profile shaped so as to promote friction on the surface of the container.

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Aroma-preserving clip device for closing Tetrarex ®-type containers

Field of application

The present invention concerns closing devices, in particular an aroma-preserving clip device for closing Tetrarex® type containers.

State of the art

Among containers for food products, the names Tetrapak® and Tetrarex® were brought into use by registered trademarks for containers made of pre-treated (waterproofed) cardboard to be used for liquids (Tetrapak), such as milk, fruit juice, etc, and for non-liquids (Tetrarex), such as coffee, chocolate, flour, sugar, biscuits, etc. On the Tetrapak containers there is generally a dotted line close to an upper corner where a small opening is to be made through which to pour the liquid, and then keep the container in the refrigerator to prevent the contents from deteriorating. For greater safety Tetrapak containers on the market are provided with means of closure such as plastic screw-on caps, pressure plugs, hermetic plastic tongues, etc. As regards the Tetrarex containers, however, it is most important to be able to open them completely at the top for access to the product inside; for this purpose, the opening, with its parallel edges, usually extends across the entire width of the container. In this case if the consumer wants to preserve the aroma and fragrance of the products, the only way to do it is to use the whole quantity at once, or else pour it into a hermetically closed container of another kind (cans or glass jars with close-fitting lids etc.). The original container is therefore not necessarily the one to be used till the product has

been consumed. Means, separate from the container, are well-known for closing flexible types of food containers such as for example cellophane bags. **Figure 1** gives an isometric view of a plastic clip used for closing flexible food containers once they have been opened. The clip 1 appears like a bar-shaped object composed of two parts, 1a and 1b, joined by a hinge 2 formed in the centre of the clip, as the material is thinner at that point, and bent over. Reciprocal rotation at 180° of the two parts turning on the hinge 2 permits the clip to present two positions: open and closed. At one of the two free ends there is a hook-shaped projection 3a and, at the other end, a catch 3b the two together forming a snap catch to keep the ends closed. In the inner face of the part 1a, two parallel cavities, 4 and 5, are separated by a very thin upstanding partition 6. The cavities extend longitudinally along the whole length of the clip and penetrate to some extent through its thickness. On the inner face of part 1b are two longitudinal parallel fins 7 and 8 lying opposite to the two cavities 4 and 5 in the opposing part 1a. Thickness of the fins 7 and 8 is less than the width of the cavities 4 and 5 each fin being enlarged at its shorter edge to form a peg-shape. **Figure 2** shows how the clip 1 can be used to close a cellophane bag 20. In **Figure 3** illustrates a cross section of the clip 1 when closed, showing how the folded edges of the bag 20 pass inside it. On account of its particular shape, this type of clip cannot be used to close a Tetrarex type container because the edges of the cardboard cannot be bent inside the cavities.

Purpose and summary of the invention

Purpose of the invention is to provide a removable closing device that combines the practical features of a clip 1, designed for use on flexible containers, and able to close Tetrarex (but also Tetrapak) cardboard containers again after they have been opened. A closing device of this kind means that the Tetrarex container can become the product's ultimate container and continue to be used until all the product is consumed.

The invention achieves its purpose by means of a clip for closing food containers made of pre-treated cardboard, having an opening with parallel edges as described in Claim 1. The closing clip subject of the invention

differs from those previously known and represented in Figure 1, chiefly because of the type of longitudinal raised parts on the inner face of one of its parts and because of greater thickness of the partition between the two parallel cavities in the opposite part. Thanks to these characteristics, the two sections of the clip can be closed right across the opening in the container without having to bend its edges. At the sides of the closing means pressure is exerted against the surface of the container to keep the edges of the upper opening closely matched together. Various forms of the invention can be produced, the differences consisting in how the clip is prevented from sliding off the container following some accidental movement. In other words the various models differ in strength of the abrasive force set up between the surfaces in contact due to pressure exerted by the means of closure.

According to a first realisable form, one of the two parts composing the clip includes two longitudinal parallel and slightly-projecting ribs aligned with two longitudinal parallel grooves present in the body of the opposite part.

A second realisable form differs from the first in that the profile of the border of the partition dividing the two longitudinal cavities is discontinuous. Without provoking limitations, said discontinuity is created by a row of tiny buttons that extend along the whole length of the partition.

If for any reason the opening in the container is high up, the conformation of ribs and cavities on the one and the other part of the clip can be repeated N times.

A third realisable form has no cavities and ribs but in this case the internal surfaces of the two sections in contact with the cardboard are knurled or else indented. The measures used for the three realisable forms all tend to heighten the abrasive effect, their shape being such that they increasingly penetrate into the thickness of the cardboard, without marking it, compared with some hypothetical case in which the surfaces are smooth.

On comparing the first realisable form of the invention with the clip shown in Figure 1, it will be noted that, in spite of an apparent similarity, careful examination brings to light important structural differences that necessarily involve a different mode of use. In the case of the clip shown in Figure 1,

friction on the surfaces in contact with each other is mainly generated in the two longitudinal cavities 4 and 5, while in the case of the clip subject of the invention, friction is generated at the interface between the ribs and the cardboard, on one side of the opening, and at the interface between cardboard and the edge of the partition on the opposite side. Contrary to what happens with the clip in Figure 1, no friction is set up within the two cavities; further, since the rim of the container maintains its original shape, there is no need for the ribs to enter the cavities (and this explains their limited height). The only purpose served by the cavities is to allow a partition to emerge that is sufficiently thick to produce friction but is not excessively thick as, if it were, the advantage, compared with the case in which the surfaces in contact is uniformly flat, would be lost. It follows that, from a practical standpoint, considerable differences exist compared with the clip in Figure 1. For even better reasons the same applies to the second realisable form in which the special kind of profile for the border of the partition increases the hold created by friction.

Finally, it will be useful to compare the reliability of the snap-catch closure as known hitherto with that of the invention. For this purpose it may be noted that the part of the clip in Figure 1 that ends with the hook 3a, is more rigid than the corresponding part of the clip made according to the invention; this is so because the fins 7 and 8 are very prominent. To assist the snap-catch to work properly, the greater rigidity of the opposing parts must be compensated for by greater elasticity of the hook 3a which is achieved by making it thinner. In this way it is easier to open the container.

By means of the present invention the Tetrarex containers can also benefit from the advantages of the clip shown in Figure 1, since it is practical to use, of a small size and inexpensive to manufacture. Being so reliable, the clip, subject of the invention, could be used to close containers of the Tetrapak type (if their opening were similar to that of the Tetrarex containers). The fact that the clip does not increase the bulk of the container favours a better use of space where it is kept for use.

Short description of the figures

Further purposes and advantages of the present invention will be made clear by the following detailed description of an example of its realisation, and by the attached drawings given for purely explanatory reasons, in no way limited to these, wherein:

Fig. 1 already described, gives a perspective view of a clip for closing flexible containers (cellophane) for food products, made in accordance with the presently known art.

Fig. 2 already described, shows how the clip in Figure 1 is applied to close a flexible container for food products.

Fig. 3 already described, shows a cross section of the clip in Figure 1 when in its closed position.

Fig. 4 gives a perspective view of a clip for closing Tetrarex type containers for food products, according to a first realisable form of the present invention.

Fig. 5 shows how the clip in Figure 4 is applied to close a Tetrarex container.

Fig. 6 shows a cross section of the clip in Figure 4 in its closed position.

Figures 7, 8 and **9** respectively give a perspective view, a plan view and a front view of the clip in a realisable embodiment of the invention.

Detailed description of some preferred forms for realising the invention

Figure 4 represents a clip 40 for closing purposes, made in the shape of a bar composed of two parts, 41 and 42, of equal length, joined by a central area 43 of reduced thickness that presents a fold 43a serving as a hinge on the crosswise axis of symmetry. The two parts, 41 and 42, can lie open or be closed as they can reciprocally rotate round 180°. The visible surface of part 41 shows two longitudinal parallel ribs, 44 and 45, spaced apart. The visible surface of part 42 shows two longitudinal parallel cavities, 46 and 47, separated by a partition 48. The position of the ribs 44 and 45 is such that they lie over the cavities 46 and 47 when the clip 40 is shut. At the two free ends of the clip 40 are two respective parts, 49 and 50, that together form a snap-catch device in the guise of a hook.

Figure 5 shows how the clip 40 functions to close a Tetrarex-type waterproofed container 51, which has an opening 52 with parallel sides, after the container has been opened for the first time. The clip is simple to fit on, it being only necessary to insert the two matching edges of the opening 52 between the two parts, 41 and 42, of the clip 40, and keep them pressed together till the tooth 50.has been forced over the hook 49. Pressure exerted by the ribs 44 and 45 and pressure by the edge of the partition 48 on the surfaces of the opening 52, together keep the two parallel sides matching closely and sealing the container in this way.

The shapes of the clip 40 and of the opening 52 when it has been closed by said clip, can be seen in the cross section illustrated in **Figure 6** and need no comments. The arguments in favour of the satisfactory nature of the closure, as regards the abrasive action on the surfaces of said opening, have already been explained in the introduction and will be found there. The clip 40 is made preferably by hot-moulding plastic material in a single processing stage. Elasticity of the material used makes it possible to form the hinge 43a and the snap-catch device 49, 50. Thickness of the hook 49 must not be reduced, contrary to that of the hook in the clip described in Figure 1, because of being able to exploit residual elasticity in part 41 whose thickness can be less than that of part 42 seeing that the ribs 44 and 45 project very little. The length of the clip 40 is sufficient to receive the opening 52 in the container 51 (for example, the width is less than that of the lateral surface of the above edge); thickness of the clip when closed is about 8.5 mm to which the double thickness of the cardboard must be added.

Figures 7, 8 and **9** illustrate a realisable alternative which can make friction between the parts in contact even more effective and therefore the closure more reliable. Compared with the embodiment seen in **Figure 4**, the variation consists solely in the particular kind of discontinuous profile on the border of partition 68 between the cavities 66 and 67 (analogy of numbering having been maintained). For this purpose the border of partition 68 comprises a row of tiny buttons placed close together and covering the whole length. Main dimensions are approximately as follows: total length of the

clip 60 when closed: about 15 cm; width: 14 mm; thickness of part 61 excluding the ribs: 3 mm; thickness of each rib 64 and 65: 0.5 mm; rib width: 2 mm; space between ribs: 5 mm; thickness of part 62 excluding buttons: 5.50 mm; height of buttons: 0.5 mm; button diameter: 1.30 mm; distance between buttons: 2.5 mm; width of the partition 68: 2.05 mm; width of each cavity 66 and 67: 3 mm.

CLAIMS

1. Clip for closing containers for food products, in the form of a bar (60) divided into two parts of approximately equal length (61, 62) joined together by a central thinner area (63) that presents a crosswise bend (63a) acting as a hinge, comprising means (69, 70) for firmly engaging the two parts of said clip against the surface of the container close to its opening, and means for creating friction between the surfaces of the clip (60) in contact and the container, characterized by the fact that said means for favouring friction include:
   - at least two longitudinal parallel slightly raised ribs (64, 65) that extend for the whole length of a first said part (61) of the clip (60) on the face in contact with the container when the clip is closed,
   - at least one partition (68) between two longitudinal parallel cavities (66, 67) made in the thickness of the other (62) said part of the clip corresponding to the position of said ribs (64, 65) in the first part (61).
2. The clip in claim 1, characterized by the fact that the border of said partition (68) presents a discontinuous profile.
3. The clip in claim 2, characterized by the fact that profile discontinuity is obtained by a row of tiny buttons that extend along the whole length of said border.
4. The clip as in any one of the preceding claims, characterized by the fact that thickness of said first part (61) is less than that of the second part (62).
5. The clip as in any one of the preceding claims, characterized by the fact that it is applied to the parallel edges of a container for food products made of a Tetrarex® type of pre-treated cardboard.

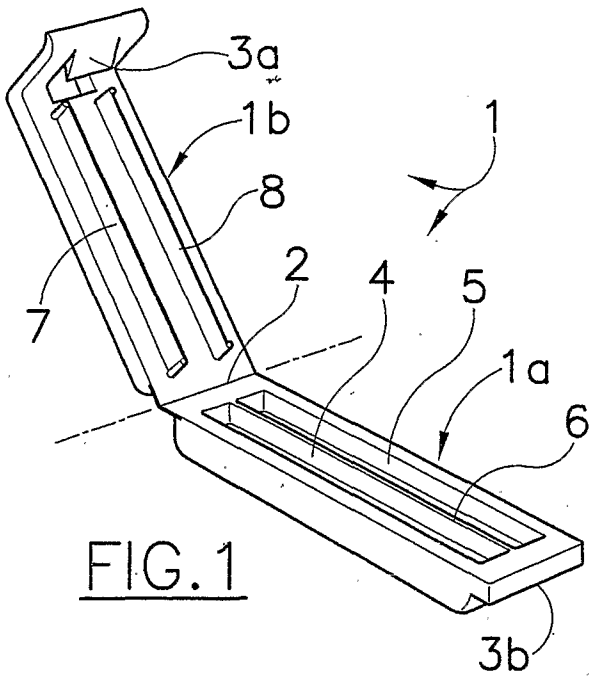

FIG.1

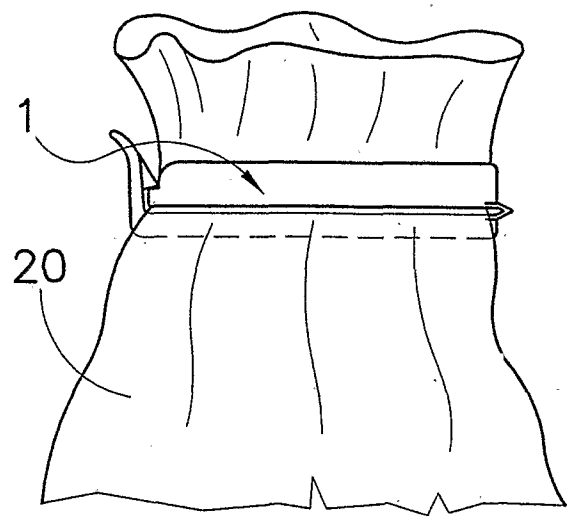

FIG.2

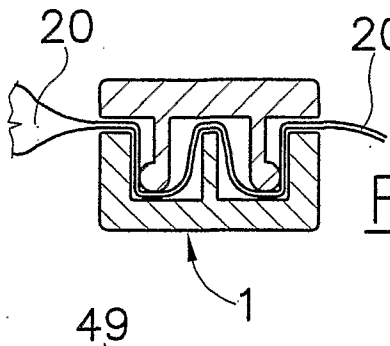

FIG.3

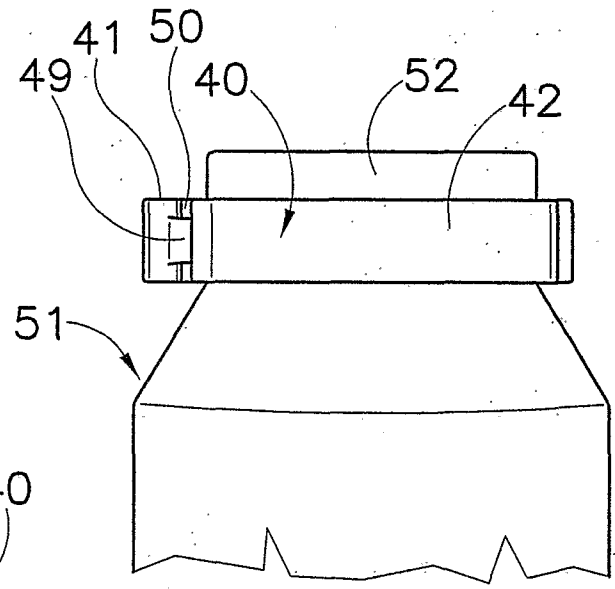

FIG.5

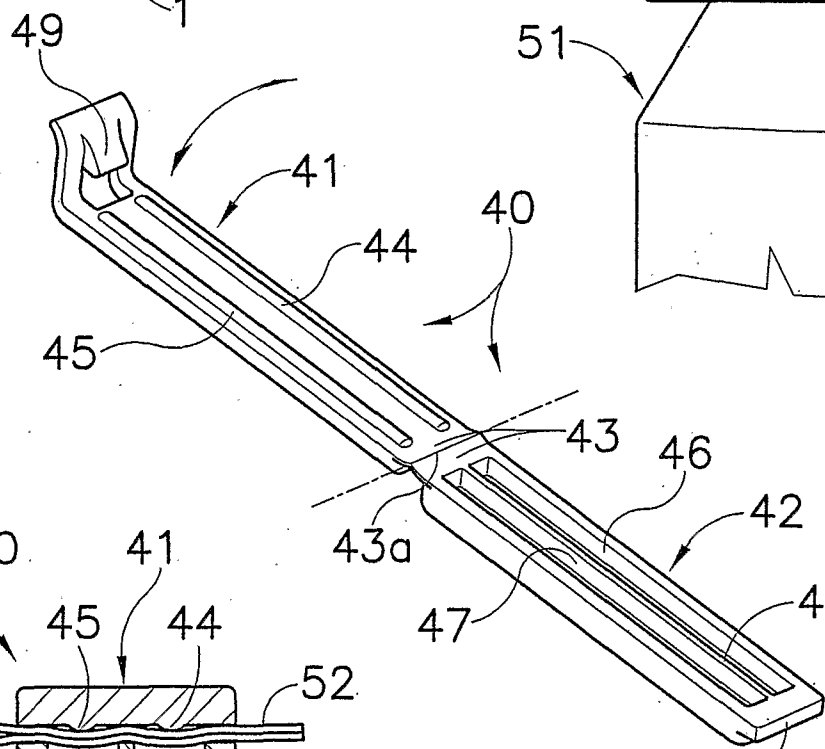

FIG.4

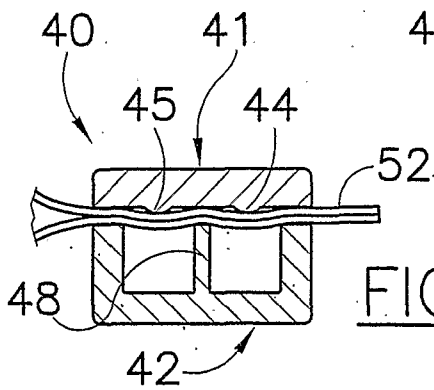

FIG.6

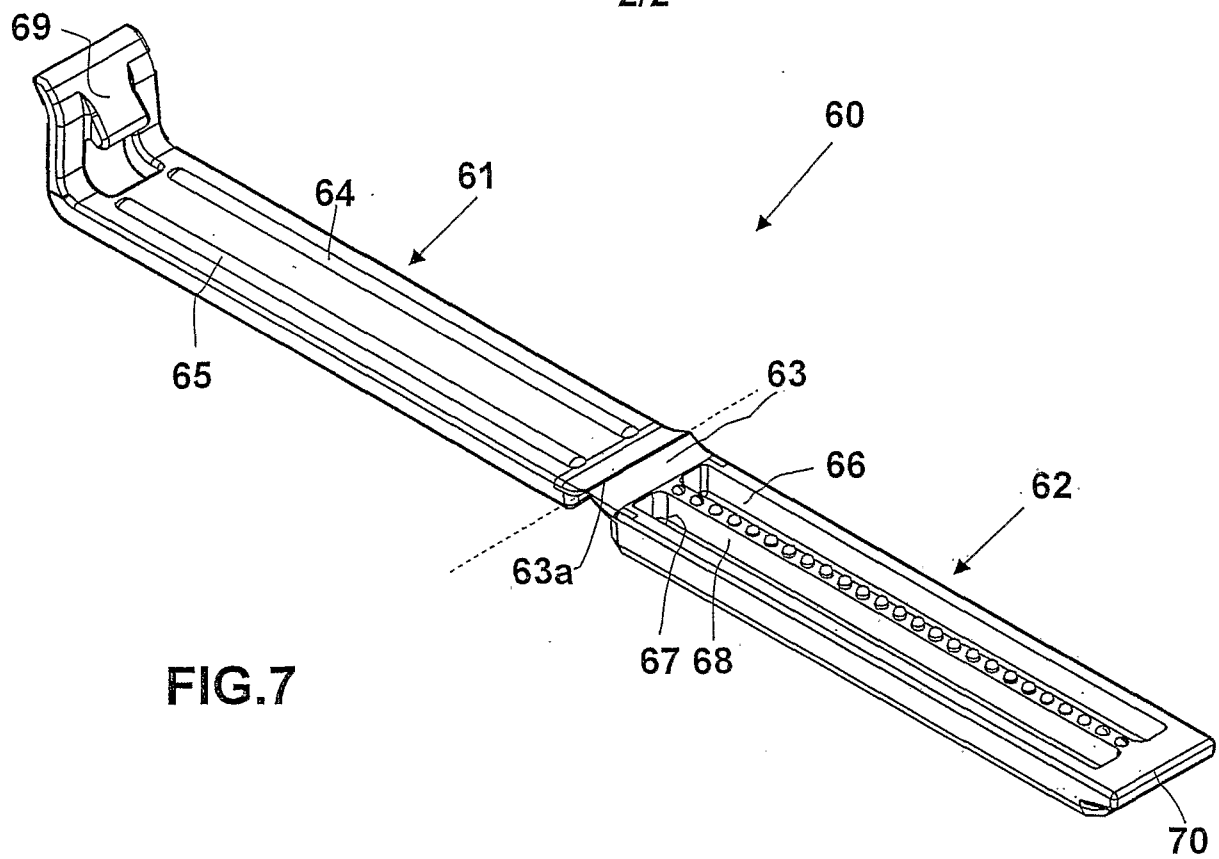

FIG.7

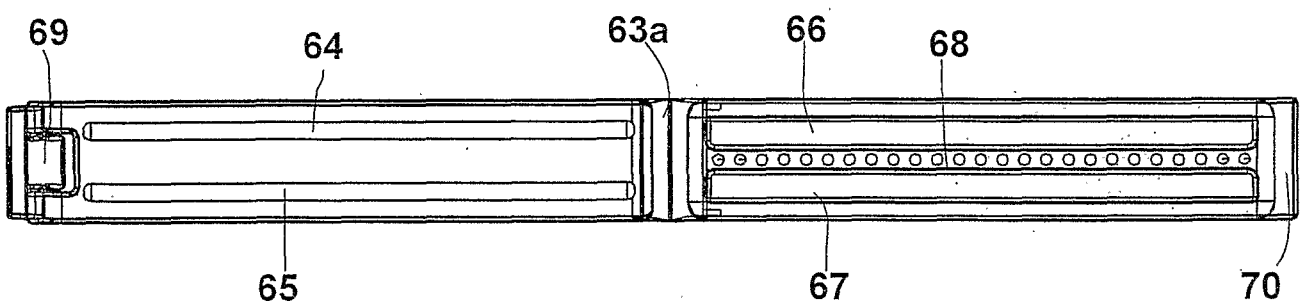

FIG.8

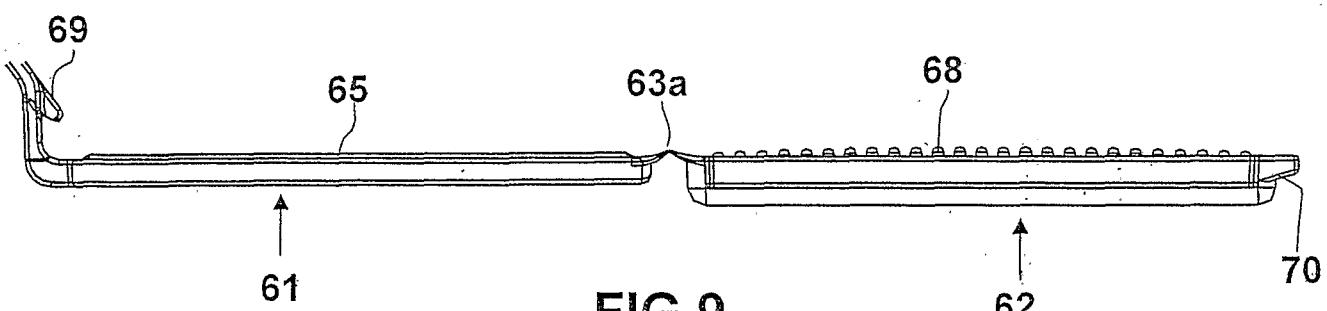

FIG.9

INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2005/000680

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D33/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	DE 299 07 150 U1 (FIPP FOLIEN + PAPIER GMBH) 5 August 1999 (1999-08-05) page 4, paragraph 2 - paragraph 5; figures 1,2a	1,4,5 2,3
Y	US 4 296 529 A (BROWN ET AL) 27 October 1981 (1981-10-27) column 3, line 66 - column 4, line 38; figures 1,5	2,3
A	DE 202 19 137 U1 (FA. HANS VIERING, INH. KLAUS VIERING) 12 June 2003 (2003-06-12) abstract; figures 1,3	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

nformation on patent family members

International application No
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 29907150 U1	05-08-1999	NONE	
US 4296529 A	27-10-1981	NONE	
DE 20219137 U1	12-06-2003	NONE	