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(71) Applicant : **Alejo Trevijano, José Javier**
Ma. Teresa Gil de Garaete, No. 39-3o.D
E-26002 Logrono (La Rioja) (ES)

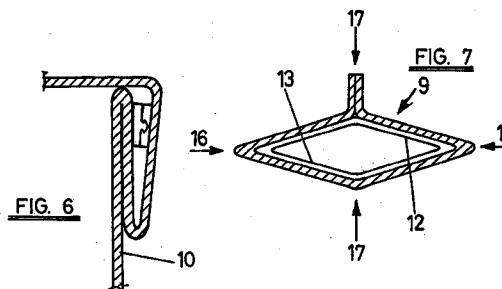
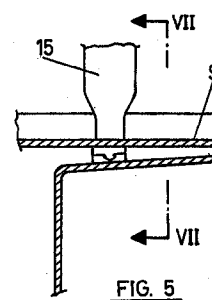
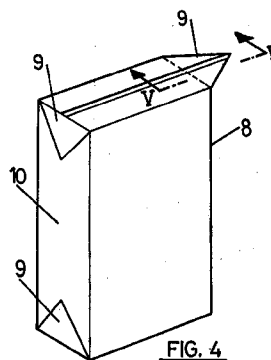
(71) Applicant : **Calle, Garay Francisco**
Hermanos Moroy 1-4-Izda
E-26001 Logrono, La Rioja (ES)

(72) Inventor : **Alejo Trevijano, José Javier**
Ma. Teresa Gil de Garaete, No. 39-3o.D
E-26002 Logrono (La Rioja) (ES)
 Inventor : **Calle, Garay Francisco**
Hermanos Moroy 1-4-Izda
E-26001 Logrono, La Rioja (ES)

(74) Representative : **Gomez-Acebo y Pombo, José Miguel**
c/o CLARKE, MODET & Co., Avda. de los Encuartes, 4
E-28760 Tres Cantos, Madrid (ES)

(54) **Hermetic seal for the pouring spout of a folding container.**

(57) Procedure for providing a hermetic seal for the pouring spout of a shapable folding container (10) of the type known by the name "tetra-pack", which consists of providing, in the internal surface of the walls defining the pouring spout (9), a transverse seal of the type consisting of two elongated facing elements (12,13), with male and female profile, which can be coupled by pressure and separated by pulling. One of the elements is initially fixed to the area that will define one of the walls of the pouring spout, before shaping the container, while the other element is fixed to the internal surface of the other wall of the pouring spout, once the container has been shaped and sealed with the liquid that it is to contain. The invention also refers to the container that includes the seal obtained with the described procedure.



This invention concerns a procedure for providing a hermetic seal for the pouring spout of a shapable folding container, of the type known by the name of "tetra-pack".

These containers are obtained from a template with a general rectangular shape, provided with folding lines which, when the longitudinal edges of the template are joined back to back and it is then shaped, define rectangular walls and end flaps which, when folded back through a right angle towards the inside, partially meet back to back and are joined, sealing the bases and, at least in one of them, defining two spouts that can be folded back on the outside over the lesser walls, one of these spouts acting as the pouring spout when cut transversely.

The template from which the container is shaped is usually made of cardboard, with waterproofing on at least its internal surface, for example by means of a lamina or coating of an olefin polymer.

The drawback with these containers is that, once they have been opened by means of cutting the pouring spout, it is no longer possible to achieve a hermetic seal again, so that the contents remain in contact with the atmosphere, thereby restricting the length of time in which they stay in their optimum condition.

The subject of this invention is the development of a procedure by means of which the pouring spout of this kind of container can be provided with a hermetic seal, which can be opened and closed as many times as is wished while the contents of the container last. In this way, the preservation of the contents of the container in a perfect condition can be ensured.

The inclusion of this seal implies a considerable advantage since, on the one hand it will allow the life of the contents to be prolonged, and on the other it will allow the contents to be maintained in optimum conditions, virtually equal to those that they had at the moment the container was opened, furthermore ensuring that the container can be carried without any risk of occasional splashing or spilling of the contents.

Another great advantage offered by the invention is that it could extend the use of this type of receptacle to the field of gasified liquids, since the preservation of this kind of product requires a hermetic seal.

A further advantage of the invention comes from the fact that the hermetic seal added to the pouring spout for containers of the type described here has a simple design and its cost is extremely low. Moreover, fitting this seal in the spout can be done by simple and economical procedures. All this means that the inclusion of the invention's seal will have hardly any effect on the final cost of the container.

In accordance with this invention, fitted to the internal surface of the walls defining the pouring spout is a transverse seal, designed in such a way that will allow easy opening and sealing from the outside of the pouring spout, opening being achieved by press-

ing the edges of that spout in opposite directions, while the seal is achieved by pressing the external surface of the walls of the pouring spout in opposite directions.

This seal can, for example, be of the type consisting of two elongated facing elements, one with a male profile and the other with a female profile, which can be joined together by means of pressure and be separated by pulling. Each of these elements is fixed to the internal surface of the walls defining the pouring spout, in the coincident transverse position, immediately outside the line of folding of the spout.

The male and female elements making up the seal are joined at the ends, forming a kind of mouth or rim that can be sealed by placing the male and elements together and pressing them. This unit is fixed via the rear surface of one of the elements - for example by microwaves, ultrasound or thermowelding - to the internal surface of the part of the template defining one of the walls of the pouring spout. This securing operation is carried on the template before the container is shaped. The other element forming part of the seal is fixed via its rear surface, also by means of microwaves, ultrasound or thermowelding, to the internal surface of the other wall of the pouring spout once the container has been shaped and sealed, filled with the liquid that it is to contain. For this the electrode or element applying the radiation, ultrasound or heat for the thermowelding is applied to the external surface of the wall on whose internal surface this second elongated sealing element is going to back on to.

Each of the elongated sealing elements can also include a rear longitudinal strip or band. These longitudinal strips or bands will be joined by their transverse edges and be fixed to the internal surface of the walls defining the pouring spout via the external surfaces of the corresponding strips or bands.

In order to avoid the bands of the male and female elements from sticking at the moment of making the union to the walls, they will be provided with a fine sheet of aluminium or other material which, placed over the contact surface of both, will prevent the bands from becoming welded together.

Another solution is to have male and female elements in such a way that one of them is located on the triangular area defining one of the walls of the pouring spout, close to the folding line separating that area from the neighbouring area of the container. The other element making up the seal is transversely cut into two equal sections. Each of these sections is fixed to one of the areas defining half of the other wall of the pouring spout, starting from the end next to the opposite element and in a perpendicular direction to it.

Once these two elements are fixed to the template in the manner described, they define a right angle C-shape, the side limbs being half as long as the

central limb. When shaping and sealing the container, the two side limbs of the C will be aligned together and facing the central limb in order to shape the male and female elements in a facing position.

The central part of the elements making up the seal may have a gap occupied by a circular piece, which will have a cross-section coincident with that of the element to which it belongs. These pieces of both elements will be able to be coupled to each other by pressure and be separated by pulling. The transverse cut of the element subdivided into two sections will be made precisely along the position of the diameter of the circular piece for that element.

A further subject of this invention is the container that includes the hermetic seal made in accordance with the described procedure.

The characteristics of the invention, as gathered together in the patent claims, will be able to be more easily understood with the following description, made with reference to the attached diagrams, which show a possible way of carrying out the invention and is to be regarded as being by way of an example only, rather than restrictive.

In the diagrams:

Figure 1 shows the design of the template from which the container will be shaped.

Figure 2 is a cross-section on a larger scale, taken along the line II-II of figure 1.

Figure 3 is a partial perspective view of the container shaped into a tube and without sealing its upper base.

Figure 4 is a perspective view of the shaped and sealed container with the spouts of the upper base extended.

Figure 5 is a cross-section on a larger scale along the line V-V of figure 4.

Figure 6 is a similar view to that of figure 5, with the pouring spout folded and backing on to the external surface of the neighbouring wall.

Figure 7 is a transverse cross-section of the pouring spout taken along the line VII-VII of figure 5.

Figure 8 shows the design of the template from which a container of the type mentioned is obtained, via a second arrangement.

Figure 9 corresponds to detail A of figure 8, on a larger scale.

The container represented in figure 5 is obtained from a template, whose design is shown in figure 1. This template, referenced with number 1, has longitudinal and transverse folding lines, referenced with number 2. These folding lines mark out rectangular-shaped sections 3 that will make up the walls of the container when it is shaped. The folding lines 2 also mark out sections 4 in the extensions of the areas 3, which will form flaps that fold through a right angle towards the inside of the container in order to seal its bases.

In areas 4 occupying the extension of the narrow-

er zones 3, and which will form the smaller walls of the container, two folding lines 5 are also made that will mark out a central triangle 6 and two side triangles 7 that correspond to half the central triangle 6. When the container 8 is shaped and the sections 4 are folded in order to seal the bases, the triangles 6 and 7 allow spouts 9, figure 5, to be obtained, which will back on to the external surface of the smaller neighbouring walls 10.

So far, the design of these containers is traditional and extremely well known.

When it is wished to proceed to open the container, figure 4, a cut is made in one of the spouts 9, which will define the mouth of the opening.

According to this invention, the container represented in figure 1 has an internal hermetic seal in one of the spouts 9, which will be intended for being cut in order to act as the pouring spout.

This seal is of the type that consists of two warped elements, by way of strands or strips, having longitudinal male and female shapes that face each other and can couple to each other. These seals are widely used, for example, for sealing the openings of bags made of plastic or similar material.

According to this invention, the two elements making up the seal are joined at their ends, creating a strip 11, figure 1, which, via the rear surface of one of the elements, backs on to one of the triangular areas 6 that will shape the upper base of the container, in a position parallel and close to the folding line 2 separating this triangular area 6 from the area 3 corresponding to the side face 10 of the container. The piece 11 is fixed to the internal surface of the template 1, in the position shown in figure 1, by means of energy radiation, ultrasound, thermowelding or microwaves.

Figure 2 represents in transverse cross-section the two elongated elements, male 12 and female 13, making up the seal of the kind mentioned. In this case it is the female element 13 that is fixed by its external surface to the template 1, though it could also be the male element 12. The base of these elements can also include a band 14 of greater width, via which they will be fixed to the corresponding surfaces of the container.

For fixing the element 11 to the template 1, a longitudinal separation band 14a, figure 2, for example of aluminium, can be provided in the band 14 supporting the male 12 and female 13 pieces, in order to prevent these elements from becoming joined together. In this figure the joins between the band 14 and the template 1 are referenced with number 18.

Once the piece 11 that will shape the seal has been fixed in the described area, the container is then shaped in the manner that is well known until it takes on a tubular shape, as shown in figure 3. In this position the container is filled and cut to the required length. The position of the piece 11 which will shape

the seal of the container can be appreciated in this figure 3.

Once the container has been filled, it is sealed in the traditional prismatic shape, as shown in figure 4. In this situation, piece 4 will be left inside one of the spouts 9 of the upper base, for example the one that has not been folded down in figure 4, and joined to the internal surface of one of the walls of the spout. In order to fix the male element 12 to the internal surface of the other wall of the spout 9, an electrode 15 or radiation source is applied to the external surface of the upper wall of the spout 9, as represented in figure 5. In this way, the male 12 and female 13 elements of the seal are transversely joined to the walls shaping the spout 9. When this spout is folded down on to the external surface of the neighbouring wall 10, as shown in figure 6, the seal is left located on that wall.

When it is wished to open the container, the spout 9 is cut, for example along the line VII-VII of figure 5. Pressing the longitudinal edges of the pouring spout 9 in opposite directions, as indicated by the arrows N° 16 in figure 7, causes the seal to open, allowing the liquid contained inside to be poured out. When it is wished to seal the container again, the walls of the pouring spout 9 are pressed in opposite directions, as indicated by the arrows 17 in figure 7, in such a way that the male 12 and female 13 elements of the seal couple to each other, thereby leaving the pouring spout hermetically sealed.

In accordance with the variant represented in figures 8 and 9, the elongated male and female elements 12 and 13 are fixed to the template 1 prior to shaping the container.

The male element 12 is fixed in the central triangular area 7, close to the folding line 2 separating this area from the neighbouring rectangular area 3 that will shape one of the smaller walls 4 of the container. The female element 13 is cut transversely through the centre into two sections of equal length, each of which is fixed to one of the side triangular sections 7, starting from the ends of the male element 12 and in a perpendicular direction to it, as can be clearly appreciated in figure 9. In this way, the two sections of the female element 13 form a right angle C-shape with the male element 12.

When the container is shaped and the corresponding spout 9 is created, the two sections 13 will be left in an aligned position, with their ends backing on to and facing the male element 12.

The rear of the male 12 and female 13 elements can be finished in a longitudinal widening or strip 14, as represented in figure 2. The shape of the couplable parts of the male and female elements can vary, corresponding to traditional shapes.

In order to achieve a more secure and hermetic seal, the ends of the two sections of the female element 13 can be finished in semicircular pieces 19, the male element 12 also being provided with a central

piece 20 with the same profile. The semicircular pieces 19 will, when the container is shaped, define a circular piece that can couple and be fixed to the circular piece 20 of the male element, ensuring the correct relative positioning of the different components of the seal. These pieces could define different shapes, for example, elliptical, polygonal, etc.

The sections 13 of the female element can be independent of the male element 12, or they can form a piece with the shape that will adopt on the internal surface of the template 1.

With this system the pouring spout 9 is provided with a seal of simple design and low cost, and with which the opening and sealing of the pouring spout can be carried out as many times as is wished, until the contents of the container 8 are exhausted.

The shapes of the couplable parts of the male 12 and female 13 elements can vary, and these elements may also lack the longitudinal widenings or bands 14.

Claims

1.- Procedure for providing a hermetic seal for the pouring spout of a shapable folding container, in which the container in the shaped position adopts a right prismatic shape, with a square or rectangular base, and is obtained from a template provided with folding lines which, when the edges of that template are placed back to back and the container is shaped, define walls and end flaps which, when folded back and joined, seal the bases and define at least one spout which when partially cut creates an outlet mouth or pouring spout, characterized by the fact that the internal surface of the walls defining the pouring spout is provided with a transverse seal consisting of two elongated facing elements, one with a male profile and the other with a female profile, which can be coupled to each other by pressure and separated by pulling, each of these elements being fixed to the internal surface of one of the walls defining the pouring spout, in a coincident transverse position, whose male and female elements are joined at their ends and, via the rear surface of one of those elements, are fixed to the internal surface of the part of the template that will define one of the walls: of the pouring spout before shaping the container, while the other element is fixed via its rear surface to the internal surface of the other wall of the pouring spout, once the container has been shaped and sealed, filled with liquid.

2.- Procedure according to patent claim 1, characterized by the fact that each of the elongated elements includes a longitudinal rear strip or band, the strips or bands of the elongated elements being joined by their transverse edges and fixing the said elements to the internal surface of the walls defining

the pouring spout, via the external surface of the strip or band.

3.- Procedure according to patent claim 2, characterized by the fact that the facing surfaces of the strips or bands of the elongated elements are provided with a coating that prevents the elements from becoming joined together.

4.- Shapable folding container with pouring spout, which adopts a right prismatic shape, with a square or rectangular base, and is obtained from a template provided with folding lines which, when the edges of that template are placed back to back and the container is shaped, define side walls and external flaps which, when folded towards the inside and joined together, seal the bases and define at least one spout which when partially cut creates a pouring spout, characterized by the fact that the said pouring spout includes a sealing device of the type consisting of two flexible elongated elements, one with a male cross-section and the other with a female cross-section, which can be coupled to each other by pressure and separated by pulling, whose elements are joined together at their ends and transversely fixed to the internal surface of the opposite walls of the pouring spout, along the whole width of those walls, surrounding the entire throat section of the pouring spout.

5.- Procedure for providing a hermetic seal for the pouring spout of a shapable folding container, in which the container in the shaped position adopts a right prismatic shape, with a square or rectangular base, and is obtained from a template provided with folding lines which, when the edges of that template are placed back to back and the container is shaped, define rectangular walls and end flaps which, when folded down and joined, seal the bases and define at least one spout which when partially cut creates an outlet mouth or pouring spout, characterized by the fact that the internal surface of the walls defining the pouring spout is provided with a transverse seal consisting of two elongated facing elements, one with a male profile and the other with a female profile, which can be coupled to each other by pressure and separated by pulling, each of these elements being fixed to the internal surface of the walls defining the pouring spout, in a coincident transverse position, whose male and female elements are joined at their ends and, via the rear surface of one of those elements, are fixed to the internal surface of the part of the template that will define the walls of the pouring spout before shaping the container, one of the elements being located on the triangular area defining one of the walls of the pouring spout, close to the folding line separating that area from the neighbouring wall of the container, while the other element is transversely cut into two equal sections, one of which is fixed to the one of the areas defining half of the other wall of the pouring spout, starting from the end adjacent to the oppo-

site element and in a perpendicular direction to that element, both elements together defining a right angle C-shape, whose side limbs are half the length of the central limb and which will be aligned together and facing that central limb when the container is shaped.

6.- Procedure according to patent claim 5, characterized by the fact that the central part of the two elements making up the seal have a gap occupied by a shape that is preferably circular, and of equal radius, with cross-section coincident with that of the element to which it belongs, the outlines of both elements being able to be coupled to each other by pressure and separated by pulling; the transverse cut of the element that is subdivided into two sections being made diametrically along the outline of that element.

7.- Shapable container with pouring spout, which adopts a right prismatic shape, with a square or rectangular base, and is obtained from a template provided with folding lines which, when the edges of that template are placed back to back and the container is shaped, define side walls and end flaps which, when folded towards the inside and joined together, seal the bases and define at least one spout which when partially cut creates a pouring spout, characterized by the fact that the said pouring spout includes a sealing device of the type consisting of two flexible elongated elements, one with a male cross-section and the other with a female cross-section, which can be coupled to each other by pressure and separated by pulling, whose elements are transversely fixed to the internal surface of the opposite walls of the pouring spout, along the whole width of those walls, in facing positions and surrounding the entire throat section of the pouring spout.

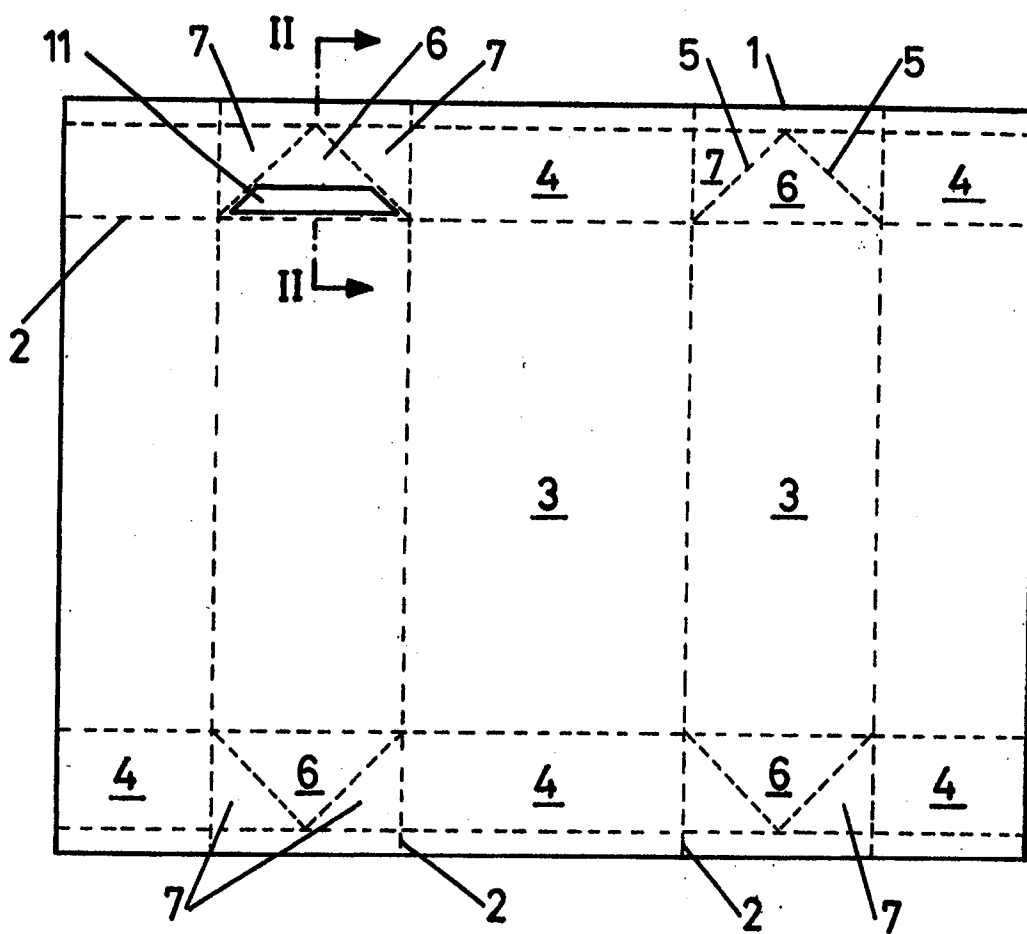
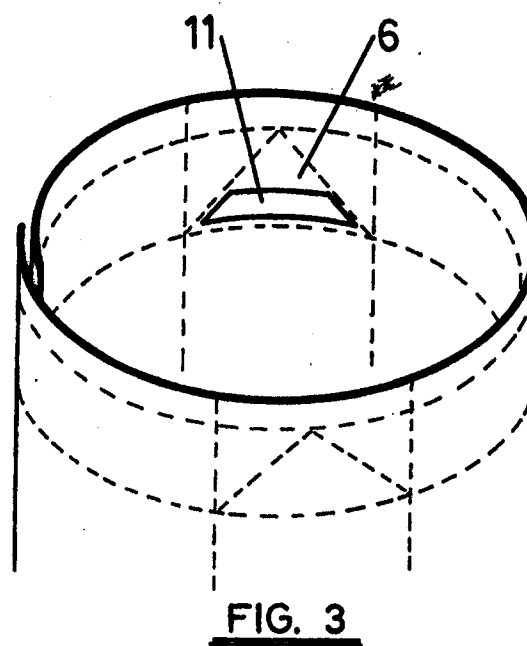
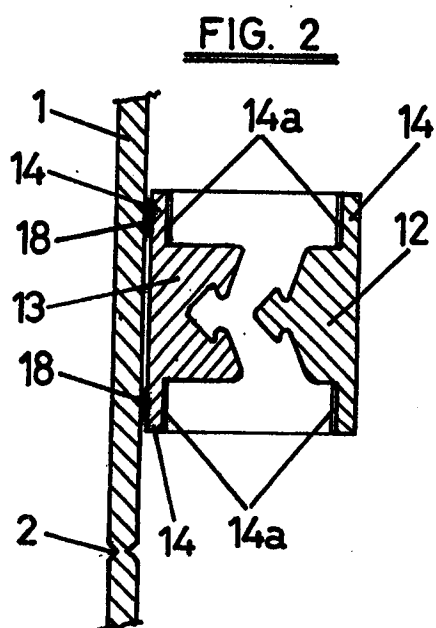
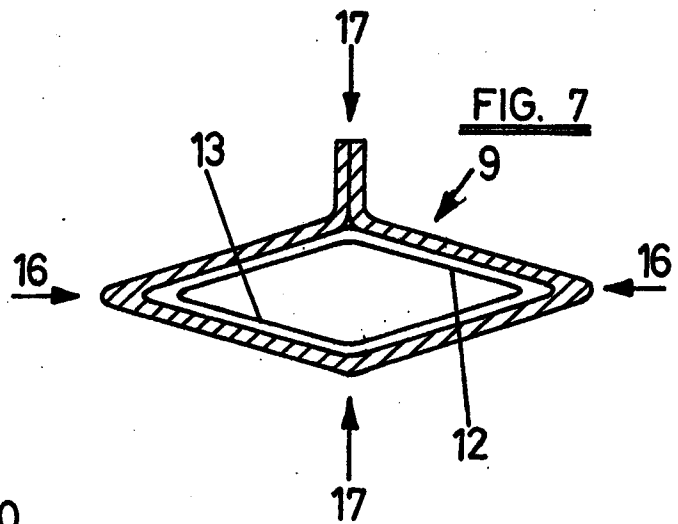
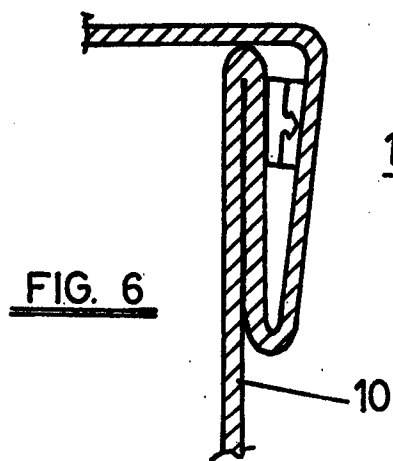
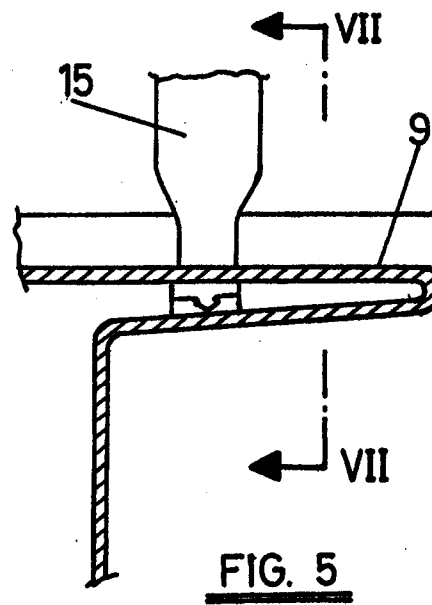
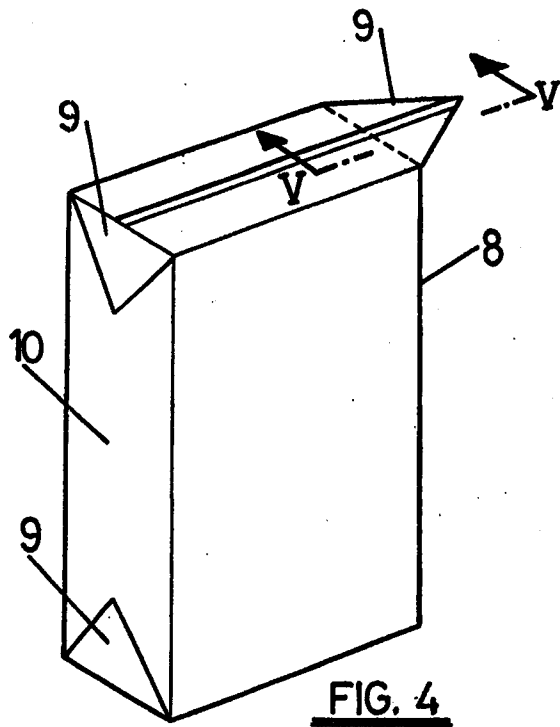
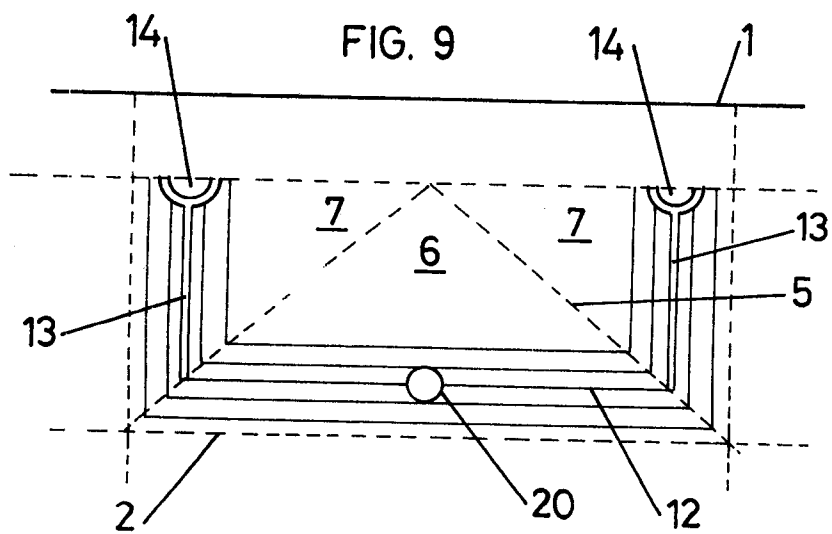
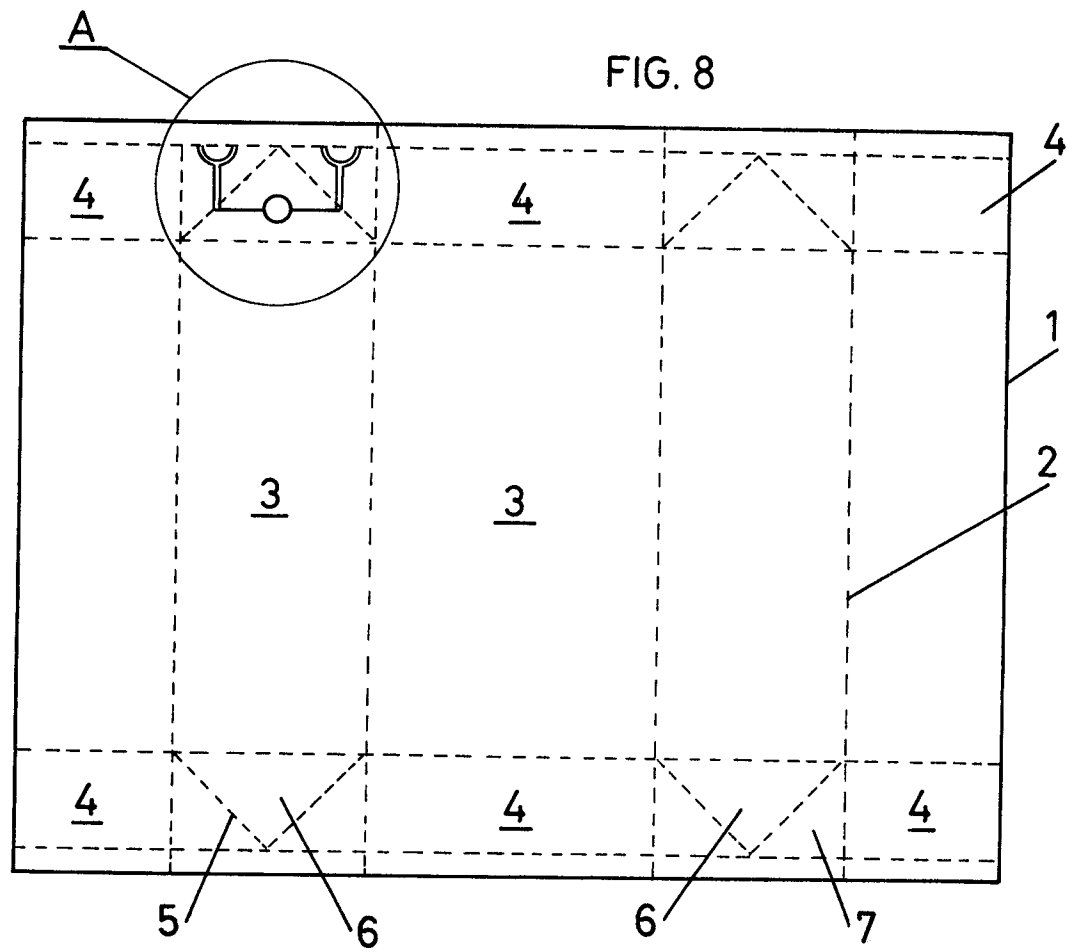


FIG. 1









European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 93 50 0014

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	DE-A-4 018 264 (ROSENSTATTER) * claims 1-5; figures 1-5 *	1,4,5,7	B65D5/06
A	US-A-4 332 344 (STRODTFOFF) * column 1, line 51 - column 3, line 27; figures 1-4 *	1-7	
A	EP-A-0 389 130 (WILSON) * page 6, line 22 - page 7, line 13; claim 1; figures 12,13 *	1-7	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B65D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27 APRIL 1993	Examiner VANTOMME M.A.
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