



(11) Publication number : **0 626 317 A1**

(12) **EUROPEAN PATENT APPLICATION**

(21) Application number : **94830242.7**

(51) Int. Cl.⁵ : **B65D 5/02, B65D 3/20**

(22) Date of filing : **24.05.94**

(30) Priority : **25.05.93 IT MI931076**

(43) Date of publication of application :
30.11.94 Bulletin 94/48

(84) Designated Contracting States :
BE CH DE ES FR GB GR LI

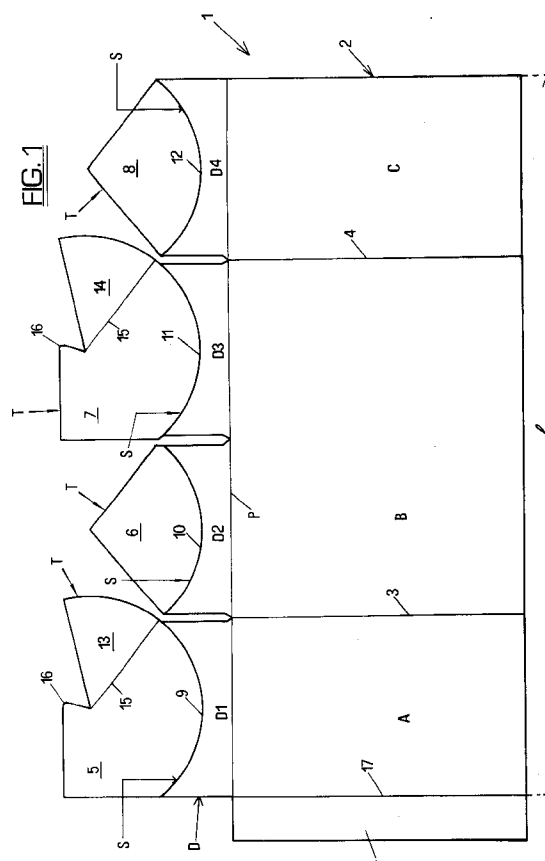
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(54) **Container made of cardboard or the like having a cylindrical shape and an automatic bottom.**

(57) The container is formed from a blank (1) having already the tongues (T) intended to form in a manner per se known the automatic bottom of the container. The blank (1) comprises a rectangular zone (2) with a glueing edge (L) intended to form the lateral wall of the container, a strip (D) projecting from the side of the rectangular zone (2) corresponding to the bottom of the container and having curved folding lines (S) from which the tongues (T) of the automatic bottom extend, each curved folding line (S) having a radius of curvature identical or different according to the cross-section of the cylindrical container to be formed. This strip (D) is folded against the rectangular zone (2) of the blank (1) and glued thereto. The tongues (T) of the automatic bottom have at least a curved side.



The present invention generally relates to containers made of cardboard or the like, having an automatic bottom and, more particularly, to a container of the above mentioned kind capable of taking a substantially cylindrical shape during the assembly.

The containers made of cardboard or the like, having an automatic bottom are already known. Their very important feature is to have a so-called "automatic bottom" that is a bottom which is self-forming during their assembly. In order to obtain the automatic bottom the blank intended to form the container is provided with suitably shaped bottom tongues having mutual engagement means. These bottom tongues are glued in pairs to each other and once the longitudinal edges of the blank have been glued therebetween and the assembly of the container is started by transforming it from a flattened or bidimensional shape, as it is put on the market, to the final open or tridimensional shape, the so glued bottom tongues are brought in such a position as to form the bottom wall of the container and are retained in this final position by the mutual engagement of the engagement means.

By means of this system containers having in plan view polygonal shapes, for example square, rectangular, pentagonal, esagonal shape etc. have been developed.

However, till now it was not possible to provide a container having an automatic bottom and a cylindrical shape.

The present invention aims at obviating this drawback by providing a blank for containers made of cardboard or the like, having a new design and capable of permitting the assembly of cylindrical containers, the term "cylindrical" meaning a solid formed by generatrices starting from points of a directrix formed by a closed line: circle, ellipse, oval...

More particularly, the blank according to the present invention is of the type having tongues intended to form the automatic bottom of the container and is characterized in that it comprises:

- a rectangular zone having a glueing edge on one of the sides perpendicular to the side corresponding to the bottom of the container and intended to form the lateral wall thereof,
- a strip projecting from the side of the rectangular zone corresponding to the bottom of the container and having at least three curved folding lines from which the tongues intended to form the automatic bottom extend, each curved folding line having an identical or different radius of curvature according to the cross-section of the cylindrical container to be formed,
- this strip being intended to be folded along a folding line which separates it from the rectangular zone of the blank and to be glued thereto,
- the bottom tongues having at least a curved

side and forming in a manner per se known by means of glueing and folding operations the automatic bottom of the container.

Advantageously, the rectangular zone has two folding lines perpendicular to the side thereof corresponding to the bottom of the container in order to allow the container to be put on the market in a flattened shape and to be opened in its final tridimensional shape upon the use.

According to a feature of the invention, the curved folding lines of the strip are in the form of circle arcs and have the same radius of curvature as that of the container to be formed.

According to another feature of the invention, the curved folding lines of the strip are ellipse segments.

According to a further feature of the invention, the curved folding lines of the strip are oval segments.

According to still another feature of the invention, a strip segment having a straight folding line can be provided.

This invention will be now described in greater detail in connection with the accompanying drawings, wherein:

Fig. 1 shows first blank for obtaining the right circular cylindrical container having an automatic bottom;

Fig. 2 shows a first mounting step of the container of Fig. 1;

Fig. 3 shows a second mounting step of the container of Fig. 1;

Fig. 4 is a cross-sectional view taken through the blank after the second mounting step of the container has been accomplished;

Fig. 5 shows the final mounting step of the container of Fig. 1;

Fig. 6 shows a second blank for obtaining the right circular cylindrical container having the automatic bottom;

Fig. 7 shows a first mounting step of the container of Fig. 6;

Fig. 8 shows a second mounting step of the container of Fig. 6;

Fig. 9 is a cross-sectional view taken through the blank of Fig. 6 after the second mounting step of the container has been accomplished;

Fig. 10 shows the final mounting step of the container of Fig. 6, looking from the bottom;

Fig. 11 shows the container of Fig. 10 in a plan view;

Fig. 12 shows a third blank for obtaining an elliptical cylindrical container having the automatic bottom;

Fig. 13 is a perspective view of the container obtained with the blank of Fig. 12;

Figs. 14 and 15 show the sectional profile of other containers obtained with the blank according to the present invention.

Fig. 1 shows a typical blank for obtaining a container having the shape of a right circular cylinder and provided with tongues, generally designated by T, intended to form in a manner per se known the automatic bottom. The blank is designated by 1 and has a zone 2 of rectangular shape intended to form the lateral wall of the container. This zone is divided in three portions A,B,C by two cross-folding lines 3,4. The rectangular zone 2 has on one shorter side thereof, in this case on the portion A, a glueing edge L. Projecting from the upper larger side of the rectangular zone 2 is a strip, generally designated by D, divided in four segments D1,D2,D3,D4 each of which terminates in one of the tongues T intended to form in a manner per se known the automatic bottom of the container and bearing here the reference numbers 5,6,7,8. This strip D is separated from the rectangular zone 2 by a longitudinal folding line P and the tongues T are separated from the relevant strip segment D1,D2,D3,D4 by curved folding lines, generally designated by S and bearing here the reference numbers 9,10,11,12. In this case the curved folding lines have the shape of an arc of circle and their radius of curvature correspond to that of the circular cylindrical container to be formed. The folding lines 9,10,11,12 in this case are four in number and their length corresponds to 1/4 of the blank length l and therefore 1/4 of the container circumference.

The tongues 5,6,7,8 have a specific shape adapted to form the engagement means of the automatic bottom and, in the blank of Fig. 1, these tongues are identical two by two. In particular, the tongue 5 has the same shape as that of the tongue 7 and the tongue 6 has the same shape as that of the tongue 8. The tongues 6 and 8 have substantially a triangular shape, whereas the tongues 5 and 7 have a composite rectilinear and curvilinear shape. In particular, each of the tongues 5,7 has a triangular tab 13 and 14, respectively and a toothed portion 16. The substantially triangular tabs 13,14 are defined by an inner folding line 15 and have a curved side which has the same radius of curvature as that of the circular cylindrical container to be formed.

Fig. 2 shows the first mounting step of the circular cylindrical container with automatic bottom starting from the blank 1. This step consists in folding the strip segments D1,D2,D3,D4 along the folding line P against the rectangular zone 2 and in glueing them thereto by leaving free the tongues 5,6,7,8.

Fig. 3 shows a second mounting step of the container. This step consists in glueing the glueing edge L to the opposite outer side of the rectangular zone 2 so as to obtain a closed element and in glueing the tabs 13,14 to the triangular tongues 6,8 so that the tabs 13,14 cover exactly the half portion of said triangular tongues, as can be seen in the cross-section of Fig. 4 wherein the zones marked by crosses designate the glueings. Once this operation is terminated,

the so obtained blank is folded along the folding lines 3,4 to form the container in the flattened condition, as it is put on the market.

Fig. 5 shows the final mounting step of the container. This step consists in opening the so glued blank by exerting an inwardly directed pressure on the cross-folding lines 3 and 4. In so doing, the tongues 5,6,7,8 automatically open inwardly until the toothed portion 16 of the tongues 5,7 engage therebetween, thus retaining the formed bottom.

Fig. 6 shows a second typical starting for obtaining a modification of the right circular cylindrical container provided with six tongues T intended to form in a manner per se known the automatic bottom. This blank is designated by 21 and has also a rectangular zone 22 intended to form the lateral wall of the container. This zone is divided also in three portions A,B,C by two cross-folding lines 23,24. The rectangular zone 22 has on one shorter side thereof, in this case on the portion A, a glueing edge L. Projecting from the upper larger side of the rectangular zone 22 is a strip D divided in three segments D1,D2,D3, each of which is provided with the tongues T, bearing here the reference numbers 25,26,27,28,29,30 intended to form the automatic bottom. This strip is separated from the rectangular zone 22 by a folding line P.

In particular, the strip segment D1 has the tongue 25, the strip segment D2 has the tongues 26,27,28 and the strip segment D3 has the tongues 29 and 30. All the tongues are separated from the relevant strip segments by curved folding lines S, bearing here the reference numbers 31,32,33,34,35,36. Here again the curved folding lines have the shape of an arc of circle and their radius of curvature correspond to that of the circular cylindrical container to be formed. The folding lines 31,36 in this case are six in number and their length corresponds to 1/6 of the blank length l and therefore to 1/6 of the container circumference.

The tongues 25-30 have a specific shape adapted to form the automatic bottom and, also in the blank of Fig. 6, these tongues are identical two by two. In particular, the tongue 25 has the same shape as that of the tongue 28, the tongue 26 has the same shape as that of the tongue 29 and the tongue 27 has substantially the same shape as that of the tongue 30. The tongues 25,28 have substantially a triangular shape with curved sides and the tongues 26,29 have substantially the shape of a rhombus with curved sides, divided in two tabs E,F by an inner folding line 37, whereas the tongue 27 has the shape of a circle, the radius of curvature of which corresponds to that of the container to be formed and the tongue 30 has the shape of a circle segment.

Fig. 7 shows the first mounting step of the circular cylindrical container with automatic bottom starting from the blank 21 of Fig. 6. This step consists in folding the strip segments D1,D2,D3, along the folding line P against the rectangular zone 22 and in glueing

them thereto by leaving free the bottom tongues 25-30.

Fig. 8 shows the second mounting step of the container starting from the blank 21 of Fig. 6. This step consists in glueing the edge L to the opposite edge of the rectangular zone 22 so as to obtain a closed element and in glueing the tongues 25,28 to the tabs F of the tongues 26,29. Then the circular tongue 27 is folded along the diametral folding line 38 and the semicircular portion G of this tongue to the tongue 30 having the shape of a circle segment which now, after the closed element has been formed, is in front of the circular tongue 27, as can be seen from the cross-section shown in Fig. 9. Once this operation is terminated, the so obtained blank 21 is folded along the cross-folding lines 23,24 to form the container in the flattened condition, as it is put on the market.

Fig. 10 shows the final mounting step of the container. This step consists in opening the so glued blank by exerting an inwardly directed pressure on the cross-folding lines 23 and 24. In so doing, the tongues 26,27 and 29 automatically open and the tongue 30 overlaps the circular tongue 27 in order to impart the necessary dimensional stability to the finished container.

In Fig. 10 the container is viewed from the bottom so as to show the tongues 26 and 29 which overlap the circular tongue 27.

In Fig. 11 the container is viewed from the top, so as to show the tongue 30 having the shape of circular segment which overlaps the circular tongue 27.

In this case the engagement means shown in the blank of Fig. 1 are not provided, but in their place there are the tongues 27 and 30, which impart the dimensional stability to the circular cylindric container once it has been open from the flattened condition to the final tridimensional shape.

Fig. 12 shows a third typical blank for obtaining a container having an elliptical cylindrical shape provided, as in the embodiment of Fig. 6, with six tongues T intended to form in a manner per se known the automatic bottom. This blank is designated by 121 and has also a rectangular zone 122 intended to form the lateral wall of the container. This zone is divided also in three portions A,B,C by two cross-folding lines 123,124. The rectangular zone 122 has on one shorter side thereof, in this case on the portion A, a glueing edge L. Projecting from the upper larger side of the rectangular zone 122 is also a strip D divided in three segments D1,D2,D3, each of which is provided with the tongues T, bearing here the reference numbers 125, 126,127,128,129,130 and intended to form the automatic bottom. This strip is separated from the rectangular zone 122 by a folding line P.

In particular, the strip segment D1 has the tongue 125, the strip segment D2 has the tongues 126,127,128 and the strip segment D3 has the tongues 129 and 130. All the tongues are separated from

the relevant strip segments by curved folding lines S, bearing here the reference numbers 131,132,133, 134, 135, 136, which represent the six ellipse segments in which the elliptic cylindrical container to be formed has been divided.

The tongues 125-130 correspond to the tongues 25-30 of the blank of Fig. 6 and are intended to form the automatic bottom. As far as the shapes of the tongues are concerned, they correspond to those of Fig. 6. In particular, the tongue 125 has the same shape as that of the tongue 128, the tongue 126 has the same shape as that of the tongue 129 and the tongue 127 has substantially the same shape as that of the tongue 130. The tongues 125,128 have substantially a triangular shape with curved sides and the tongues 126,129 have substantially the shape of a rhombus with curved sides, divided in two tabs E,F by an inner folding line 137, whereas the tongue 127 has the shape of an ellipse, and the tongue 130 has the shape of an ellipse sector.

The mounting of the container according to Fig. 12 occurs exactly in the same manner as that of the container of Fig. 6, the sole difference being given by the fact that the base of the cylinder in this case corresponds to an ellipse and not to a circle.

In Fig. 13 the elliptical cylindrical container with the formed automatic bottom is shown in perspective view.

Of course, although only three embodiments of the present invention have been described, illustrating a circular cylindrical container formed starting from four and from six strip segments each having a curved folding line and an elliptical cylindrical container formed starting from six strip segments each having a curved folding line, it is apparent that the curved folding lines can be eight or more in number.

In Fig. 14 there is diagrammatically shown, for example, the cross-section of an oval cylindrical container and, if in the strip D also a segment having a straight folding line is provided, a cylindrical container having a flat wall portion can be obtained, as illustrated in Fig. 15.

From the foregoing, it can be seen that by means of the blank according to the present invention it is possible to obtain a cardboard container or the like having the generic external shape of a cylinder in the mathematical sense expressed in the introductory portion of the description and provided with automatic bottom, what it was not possible to obtain using the blanks provided with tongues for the automatic bottom till now used.

Claims

1) Container made of cardboard or the like, having generally a cylindrical shape and an automatic bottom, obtained from a blank with tongues intended

to form the automatic bottom of the container, characterized in that the blank comprises:

- a rectangular zone (2) having a glueing edge (L) on one of the sides perpendicular to the side corresponding to the bottom of the container and intended to form the lateral wall thereof,
- a strip (D) projecting from the side of the rectangular zone (2) corresponding to the bottom of the container and having at least three curved folding lines (S) from which the tongues (T) intended to form the automatic bottom extend, each curved folding line (S) having an identical or different radius of curvature according to the cross-section of the cylindrical container to be formed,
- this strip (D) being intended to be folded along a folding line (P) which separates it from the rectangular zone (2) of the blank (1) and to be glued thereto,
- the bottom tongues (T) having at least a curved side corresponding to the curved folding lines (S) and forming in a manner per se known by means of glueing and folding operations the automatic bottom of the container.

2) Container according to claim 1, characterized in that said rectangular zone (2) has two folding lines (3,4) perpendicular to the side corresponding to the bottom of the container in order to allow the container to be put on the market in a flattened shape and to be opened in its final tridimensional shape upon the use.

3) Container according to claims 1 and 2, characterized in that said curved folding lines (S) of the strip (D) are four in number (9,10,11,12) and there are four bottom tongues (5,6,7,8) extending therefrom, said curved folding lines (9,10,11,12) being in the form of arc of circle and having the same radius of curvature as that of the container to be formed.

4) Container according to claim 3, characterized in that the bottom tongues (5,6,7,8) are identical two by two.

5) Container according to claims 3 and 4, characterized in that at least a pair of bottom tongues (5,6,7,8) is provided with engagement means (16) for closing the automatic bottom.

6) Container according to claims 3 and 4, characterized in that a pair of bottom tongues (6,8) have substantially a triangular shape.

7) Container according to claims 1 and 2, characterized in that said curved folding lines (S) of the strip (D) are six in number (31,32, 33,34,35,36) and there are six bottom tongues (25,26,27,28,29,30) extending therefrom, said curved folding lines (31,32,33,34,35,36) being in the form of arc of circle and having the same radius of curvature as that of the container to be formed.

8) Container according to claim 7, characterized in that four of the bottom tongues (25,26,28,29) are identical two by two, the bottom tongue (27) has a cir-

cular shape and the bottom tongue (30) has a segment circular shape having the same radius of curvature as that of the bottom tongue (27) and that of the container to be formed.

9) Container according to claims 1 and 2 characterized in that said curved folding lines (S) of the strip (D) are six in number (131,132, 133,134,135,136) and there are six bottom tongues (125,126,127, 128,129,130) extending therefrom, said curved folding lines (131, 132,133,134,135,136) being in the form of ellipse segments.

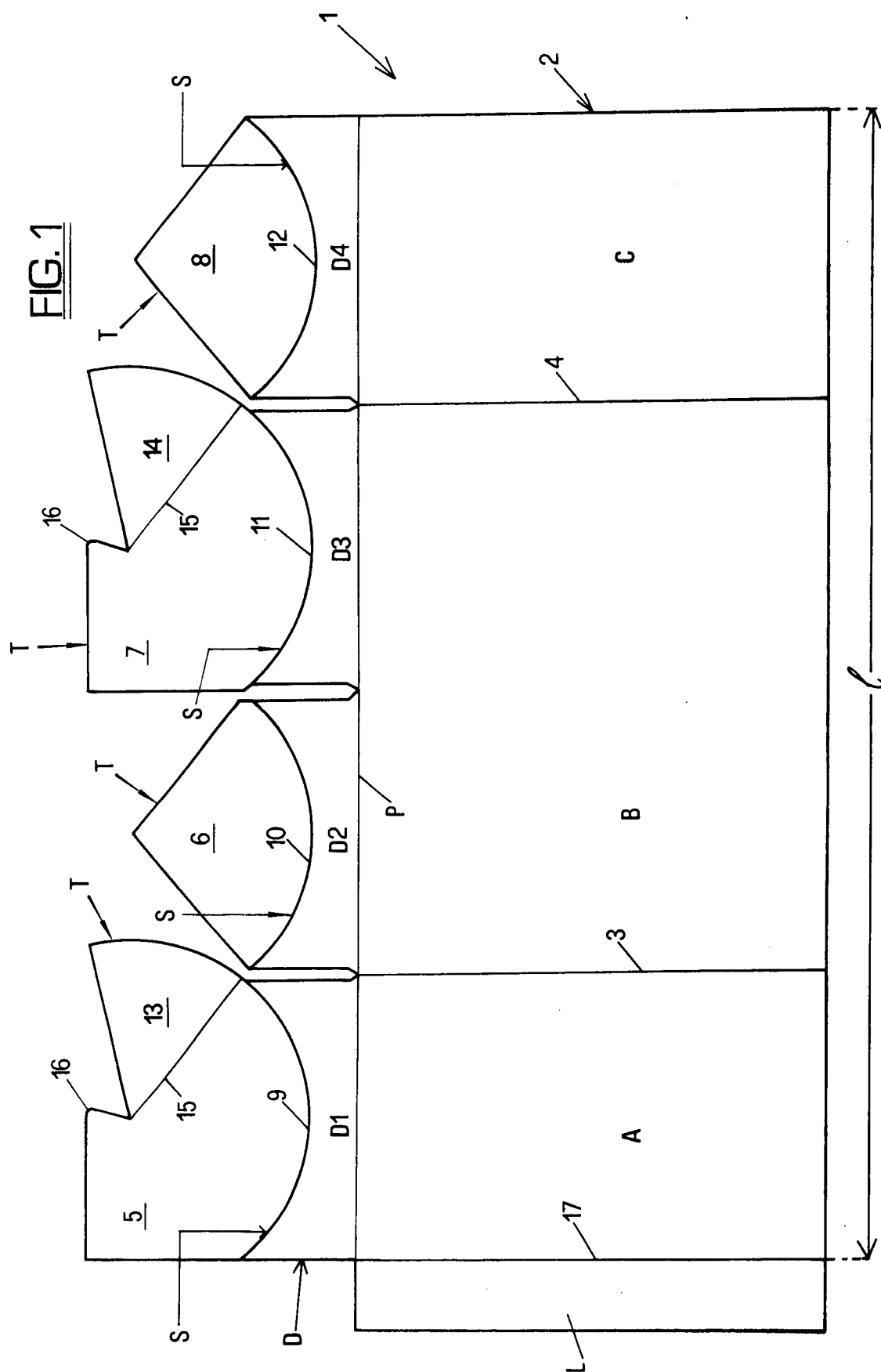
10) Container according to claim 9, characterized in that four bottom tongues (125,126,128,129) are identical two by two, the bottom tongue (127) has an elliptical shape and the bottom tongue (130) has a sector ellipse shape.

11) Container according to claim 1, characterized in that said curved folding lines (S) of the strip (D) are oval segments.

12) Container according to one of the preceding claims, characterized in that a strip segment having a straight folding line can be provided.

13) Container according to one of the claims 7-12, characterized in that a pair of bottom tongues (25,28; 125,128) have substantially a curvilinear triangular shape.

14) Container according to claims 1 and 7-12, characterized in that a pair of bottom tongues (26,29; 126,129) have substantially a curvilinear rhombic shape.



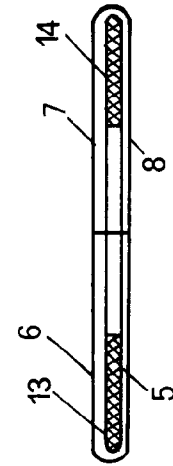
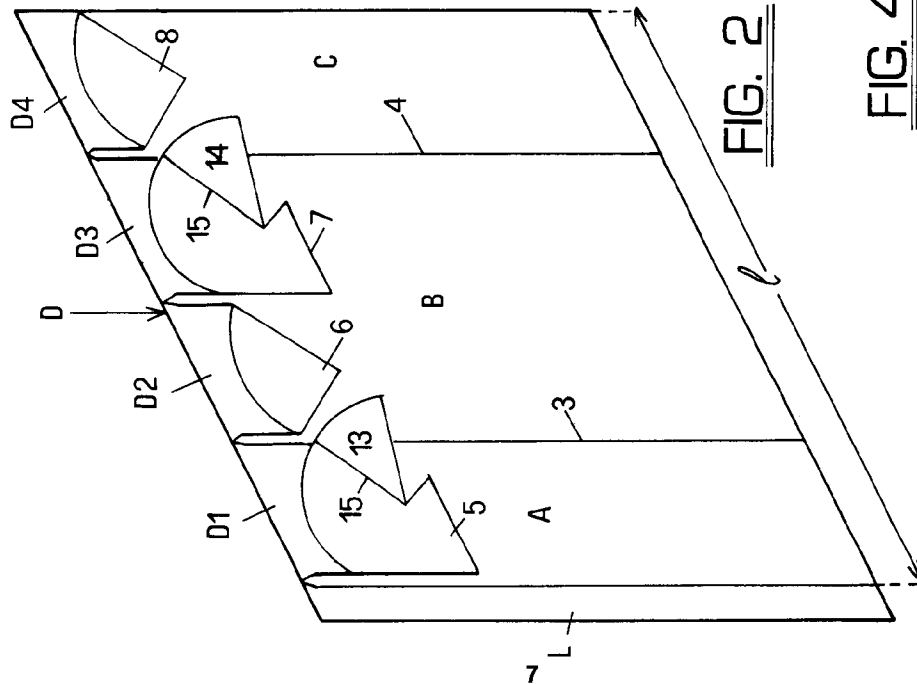


FIG. 4

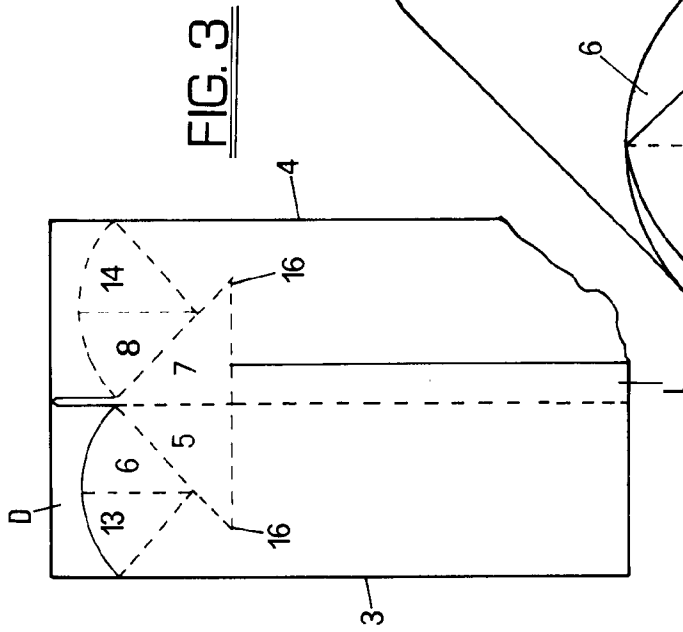


FIG. 3

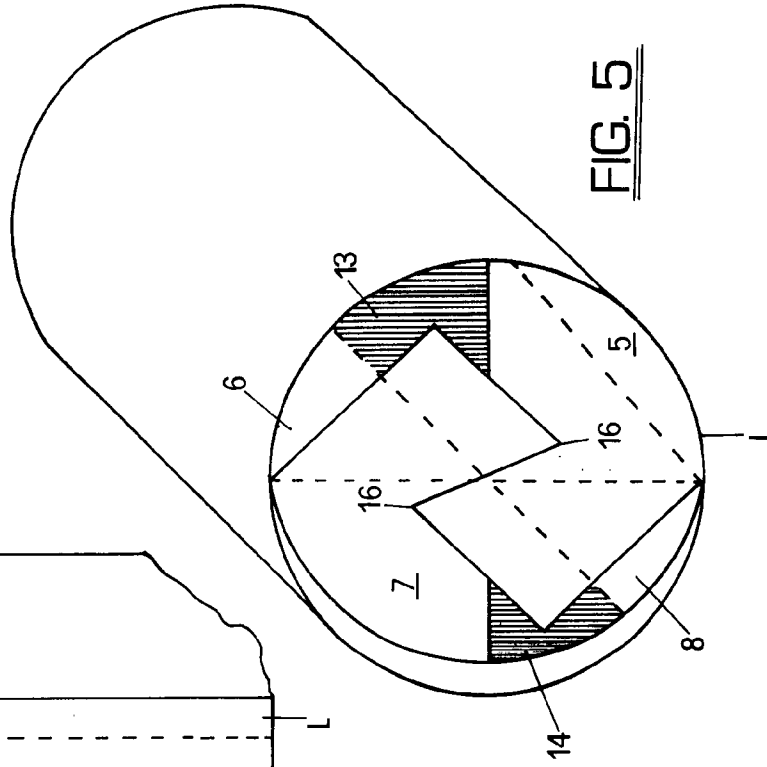
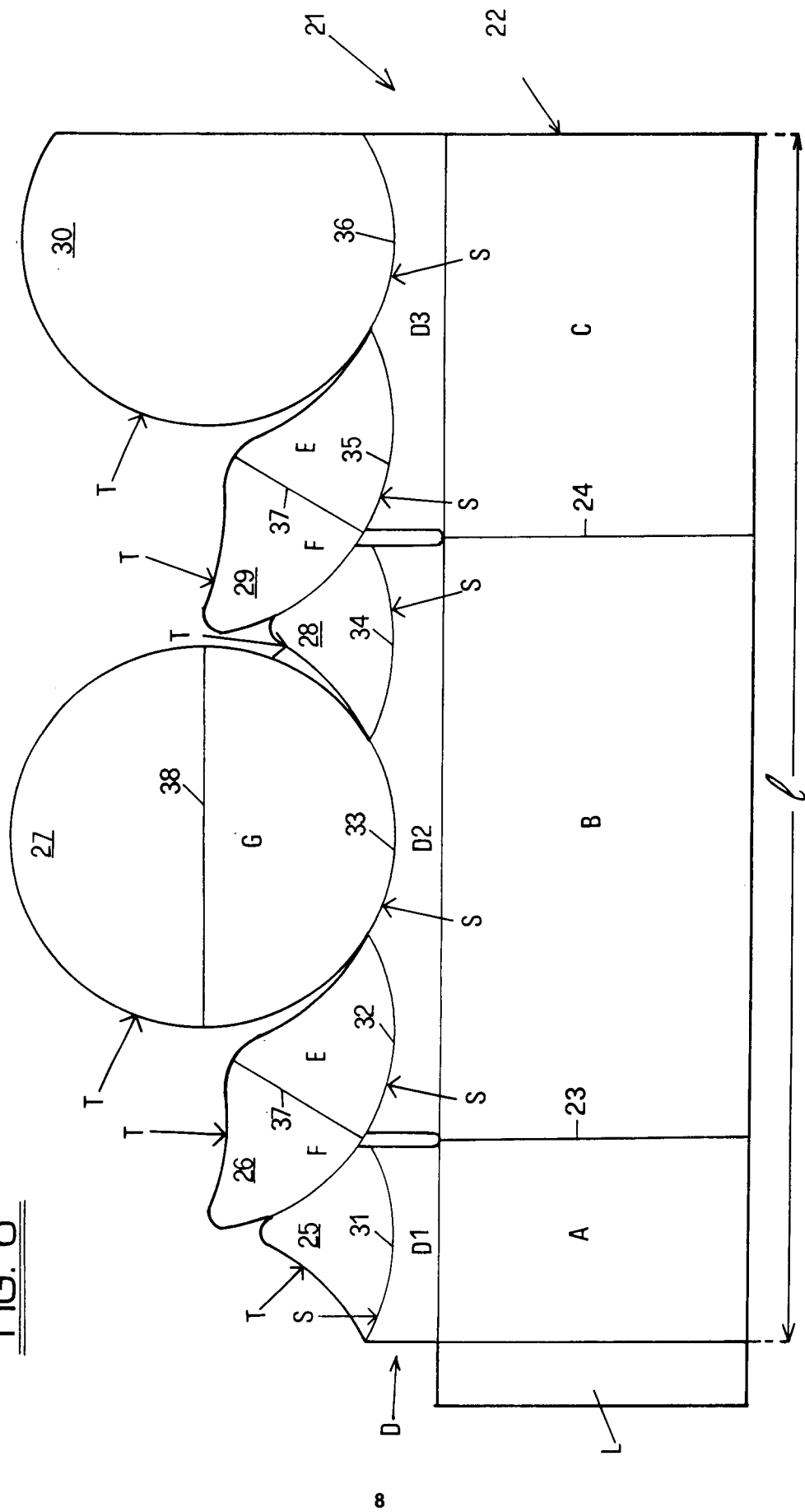


FIG. 5

FIG. 6



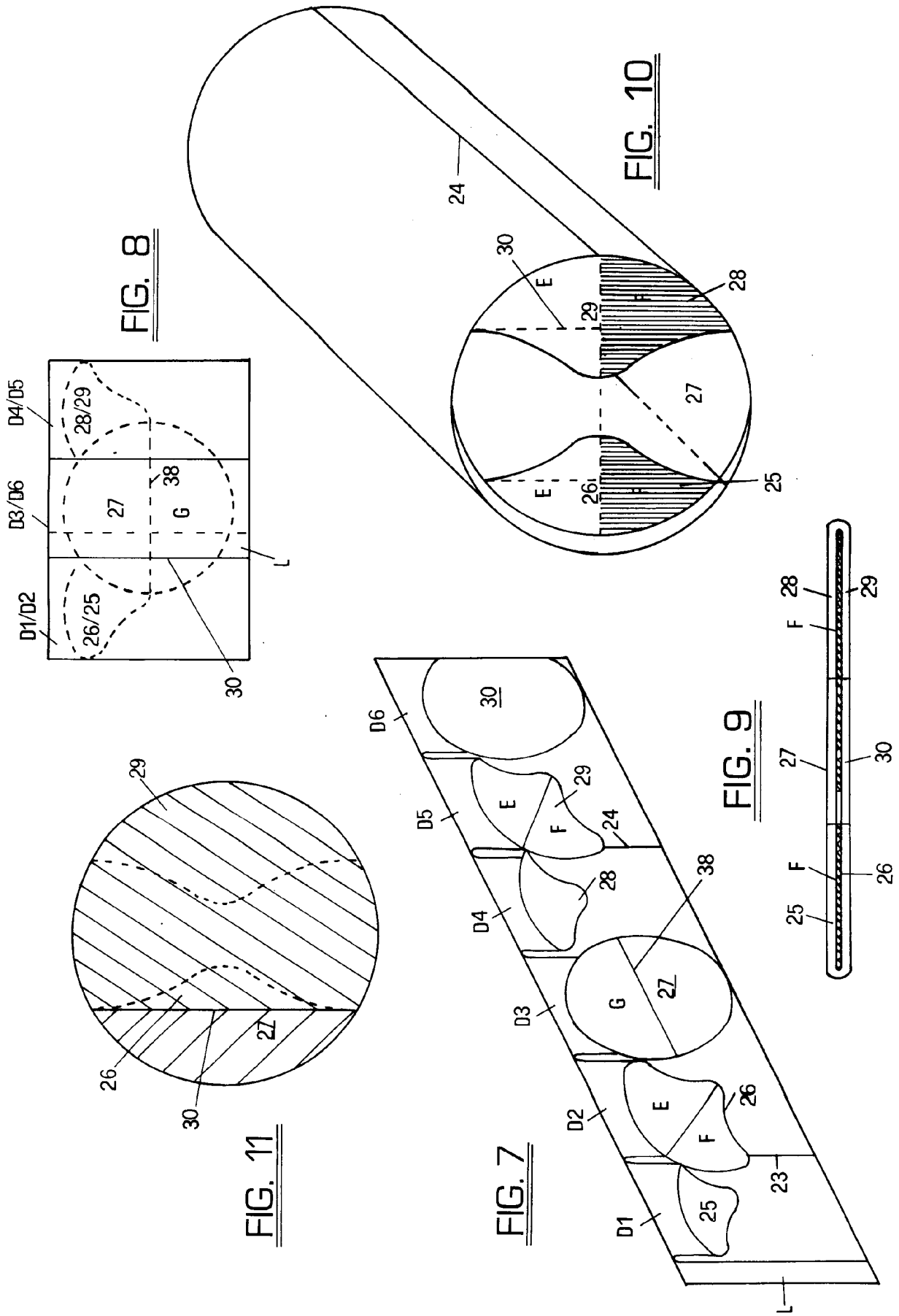


FIG. 12

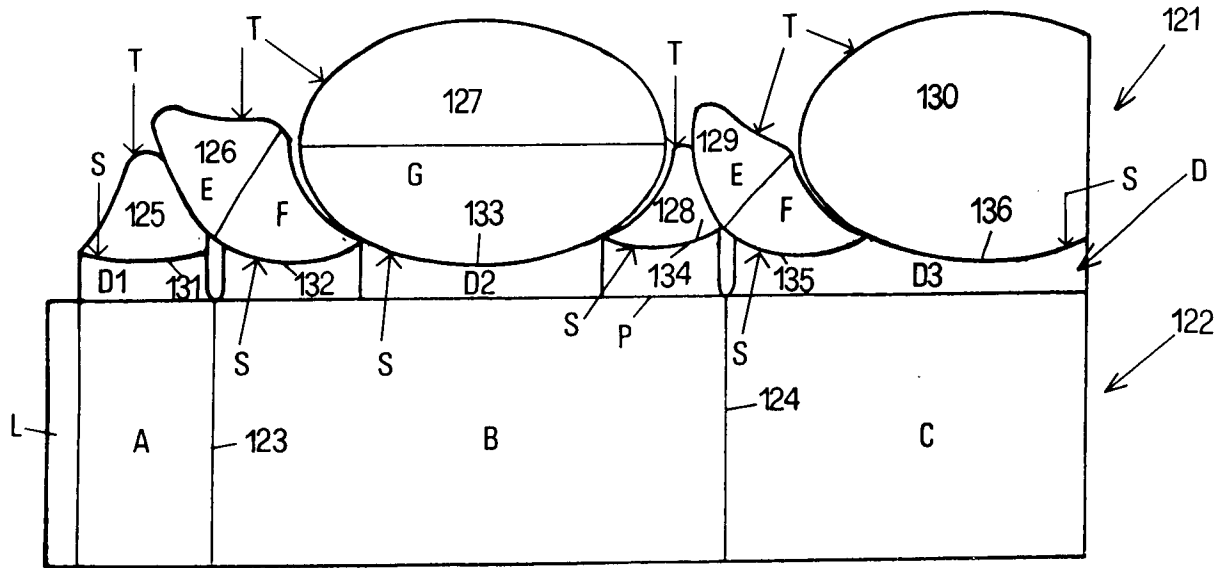


FIG. 13

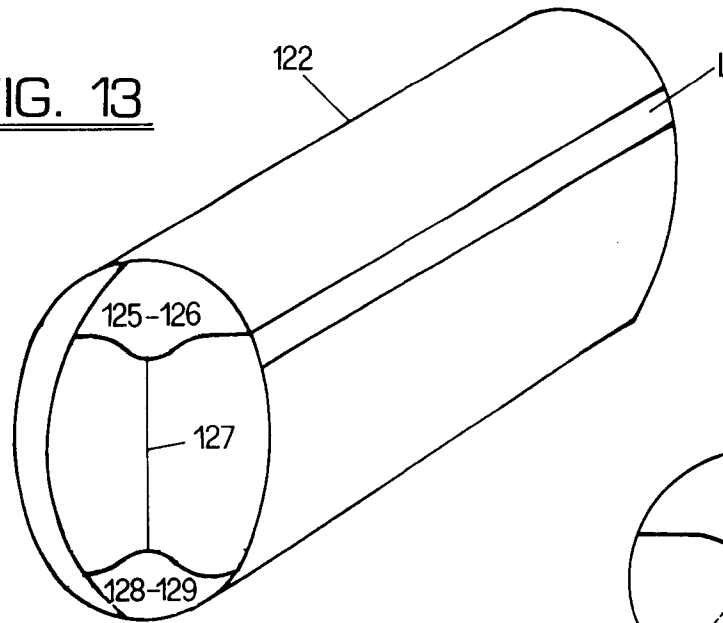


FIG. 14

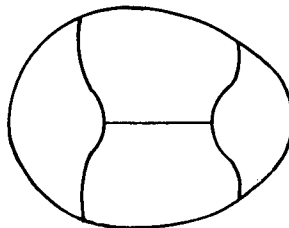
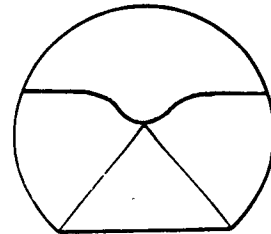


FIG. 15





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 83 0242

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)
Y	DE-A-40 33 947 (SEUFERT THORSTEN) * the whole document *	1-6	B65D5/02 B65D3/20
Y	FR-A-2 375 100 (NICOLLET SA) * the whole document *	1-6	
A	US-A-2 189 436 (ROSENFELD) * figures *	1,3-6	
A	US-A-3 912 331 (TURNER ET AL.) * abstract; figures *	1,2	
			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 31 August 1994	Examiner Gino, C
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