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(54) Flexible pouch contoured to facilitate pouring.

(57) A flexible self-standing pouch (10) made from at least one layer of plastic material bonded to form a closed inner chamber for storing liquid. Peripheral portions of the wall material are contoured and then bonded to form a closed pouring spout (34) at a corner of the pouch. The configuration of the spout is defined by the contour of the sealing in the vicinity of that pouch corner. The pouring spout is opened by cutting the pouch corner at an angle. The bonded peripheral edge (14, 16, 18, 20) has a generally rectangular contour except for an inwardly curved portion corresponding to a recess (24) in the wall material, which recess partly defines the spout configuration. This recess has a maximum height which is greater than the maximum depth measured in a direction transverse to the direction along which the height is measured. Further, the recess may either begin at the top of the pouch or at a point along the side which is spaced from the top. A juncture portion along the top of the pouch and a juncture portion along the rim of the recess define the configuration of the open pouring spout, which open spout is intended to be inserted in the open neck of a container to be filled.

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FLEXIBLE POUCH CONTOURED TO FACILITATE POURING

This invention relates to a flexible pouch made of laminated material used for refilling other containers.

The use of flexible pouches liquids made of laminations of plastic material to dispense liquids is well known. One such pouch is disclosed in U.S. Patent No. RE 24,251.

A pouch made of metallic foil and having a contoured pouring spout is disclosed in U.S. Patent No. 3,907,164. However, this conventional package has a reduced storage capacity due to the shape of the container and has no means for facilitating the pouring of liquid from the container into the neck of another container. The latter disadvantage is because when the pouch is turned to the pouring position, its pouring spout does not make use of the contoured configuration. On the contrary, the contour merely serves to define the pouring spout and not to receive or fit into the neck of another container.

An object of the invention is to overcome the foregoing disadvantages of conventional pouches for storing liquids.

The present invention aims to provide a heat-sealed pouch which has a contoured configuration which facilitates the pouring of liquid from the pouch into another container.

The invention also aims to provide a pouch having a spout which can be mass-produced from webs of sheet-like material with a minimum of wasted material.

According to the present invention a flexible pouch for storing liquids has at least one corner thereof a configurationa of spout-like shape adapted, on being cut across the said configuration, to afford a spout. The said corner is preferably defined by edges inclined to each other and the spout-like configuration is afforded by a recess in at least one of the said edges.

In a preferred form of the invention a flexible self-standing pouch for storing liquid therein, comprises first and second wall means made of non-rigid sheet material, the said first wall means having a first peripheral edge and the said second wall means having a second peripheral edge, the said first peripheral edge being bonded to the said second peripheral edge to form a sealed juncture, the said first and second wall means and the said sealed juncture defining a closed chamber, the said juncture comprising a top portion connected to a first side portion, the said first side portion in turn comprising an inwardly curved portion which defines at least part of a recess in the said pouch, opposing portions of the said first and second wall means forming a spout portion suitable for use as a spout when the said opposing portions of the said wall means are cut along a line extending from a point along the said recess to a point along the top of the pouch, e.g. a top portion of the juncture.

The said first and second wall means need not be integrally connected and the said juncture will then have a closed contour. When the first and second wall means are integral and the pouch is made by folding over the sheet material the juncture will be afforded by the adhered region around most of the periphery of the pouch but by the fold line over the rest of the periphery.

Thus the said juncture may further comprise a second side portion connected to the said top portion and a bottom portion connected to the said first and second side portions.

The said recess may have a semicircular configuration and may be spaced a predetermined distance from an end of the said top portion.

Alternatively the said first side portion may further comprise first and second substantially straight portions connected to the said inwardly curved portion, the said first substantially straight portion being arranged adjacent to an end of the said top portion.

The said top portion may be substantially straight, and the said top portion and said first substantially straight portion may form an angle therebetween which is less than 90 degrees.

A flexible pouch in accordance with the present invention is preferably a self-standing flexible pouch made from at least one layer of plastic material e.g. heat-sealed to form a closed inner chamber for storing liquid. Alternatively a pouch in accordance with the invention may have laminated walls comprising a layer of foil adhered to a layer of plastic.

A pouch in accordance with preferred embodiments of the invention has a peripheral edge formed by fin-sealing two layers of wall material together. In accordance with one preferred embodiment, two sheets of wall material are fin-sealed together along their entire peripheries. In accordance with another preferred embodiment, one portion of the peripheral edge of a folded single sheet of wall material is fin-sealed to the remaining portion of the peripheral edge of that single sheet.

A self-standing pouch in accordance with preferred embodiments of the invention may be gusseted at its bottom to enable the pouch to stand in an upright. position when filled with liquid.

Peripheral portions of the wall material are preferably contoured and then adhered e.g. by heat-sealing, sonic welding or adhesive to form a closed pouring spout at a corner of the pouch. The

configuration of the spout is conveniently defined by the contour of the heat sealing or adhesion in the vicinity of that pouch corner. The pouring spout may be opened by cutting the spout configuration at the pouch corner at an angle.

In accordance with preferred embodiments of the invention, the juncture has a generally rectangular contour, except for an inwardly curved portion which defines at least a portion of a recess in the pouch wall. This recess in turn defines a part of the spout configuration. The recess preferably has a maximum height which is greater than the maximum depth measured in a direction transverse to the direction along which the height is measured; the height preferably being measured along the side peripheral edge of the pouch. In accordance with one preferred embodiment, the recess may begin at the top of the pouch. In accordance with another preferred embodiment, the recess may begin at a point along the side which is spaced from the top.

In accordance with the preferred embodiments of the invention, a juncture portion along the top of the pouch and a juncture portion along the rim of the recess define the configuration of the open pouring spout, which open spout is intended to be inserted in the open neck of a container to be filled.

In accordance with another preferred embodiment of the invention, a second recess is formed on the opposite side of the pouch, thereby defining a second closed pouring spout.

Such a recess may be of a different configuration to the first recess. The or each recess preferably is spaced from the top edge of the pouch.

Preferably one side of the recess e.g. the top side forms the bottom edge of the spout and preferably is parallel or substantially parallel to the top edge of the pouch.

One preferred form of recess is largely triangular in form.

The invention may be put into practice in various ways and a number of specific embodiments will be described by way of example to illustrate the invention with reference to the accompanying drawings in which:

Figure 1 is a side view of a flexible pouch with closed pouring spout in accordance with a first preferred embodiment of the invention;

Figure 2 is a partial side view of the flexible pouch of Figure 1 with the spout open and a partial sectional view of the neck of a container to be filled in which the open spout has been inserted;

Figure 3 is a perspective view of the flexible pouch of Figure 1 with the spout open;

Figure 4 is a side view of a flexible pouch with closed pouring spout in accordacne with a second preferred embodiment of the invention;

Figure 5 is a partial side view of the flexible pouch of Figure 4 with the spout open and a partial sectional view of the neck of a container to be filled in which the open spout has been inserted;

Figure 6 is a perspective view of the flexible pouch of Figure 4 with the spout open;

Figure 7 is a side view of a flexible pouch with reinforcement in accordance with a third preferred embodiment of the invention;

Figure 8 is a partial side view of the flexible pouch of Figure 1 with the spout open and a partial sectional view of the neck of a container to be filled in which the open spout has been inserted;

Figure 9 is a perspective view of the flexible pouch of Figure 1 with the spout open; and

Figure 10 is a side view of a flexible pouch with reinforcement in accordance with a fourth preferred embodiment of the invention.

In accordance with the first preferred embodiment of the invention depicted in Figures 1 to 3, pouch 10 is constructed from two sheets 12 of flexible wall material which are sealed together along their peripheral edges to form a closed inner chamber for holding liquid. The wall material is preferably transparent or translucent plastic of a type which will not react with the ingredients in the liquid to be stored in the pouch chamber.

During manufacture, two sheets 12 of wall material having the same shape are arranged against each other with their peripheries mutually overlapping. The corresponding peripheral edges 14, 16, 18 and 20 are bonded by heat sealing, sonic welding, adhesive or like means to form a closed inner chamber of the pouch. The bottom edge 20 is gusseted along a contour 22 to enable the pouch to stand upright when filled with liquid.

Alternatively the chamber could be formed from a single sheet of wall material by folding the wall material and then bonding the overlapping portions of the periphery of the single sheet.

After the first bonding operation, a recess 24 is formed in the respective sheets of wall material by cutting along the side peripheral edge 16. This recess has a maximum height, measured along the said peripheral side edge 16, which is greater than the maximum depth measured in a direction transverse to the direction along which the height is measured. Further, in accordance with the first preferred embodiment of the invention, the recess begins at the top of the pouch. After the recess 24 is formed, the respective sheets of wall material are bonded along the rim of the recess to again close off the pouch chamber.

In accordance with the first preferred embodiment of the invention, the bonded edge of the recess has a generally inwardly curved portion 28 with generally straight portions 30 and 32 extending therefrom.

The recess 24 defines a closed pouring spout

34. As can be seen in Figure 1, the closed spout 34 can be rounded to improve the strength and appearance of the spout.

The contour depicted in Figure 1 maximizes the storage capacity of the pouch, enhances the structural strength at the pouring spout and permits refilling of containers having necks of different diameters.

Figure 2 depicts the refilling of a container 40 by inserting the open spout of the pouch 10 in an open neck 42. The spout 34 is opened by cutting along the line A--A (see Figure 1). The cut A--A should desirably be made at an angle of 30 to 60 degrees with respect to the top peripheral edge 18, preferably 45 degrees. A 45-degree cut permits the liquid contents of the pouch to be readily drained through the spout opening 44 and into the neck 42 of the container 40.

In accordance with the first preferred embodiment, the generally straight portions 30 and 32 lie at an angle of between 25 and 30 degrees relative to the side peripheral edge 16. However, the portions 30 and 32 can lie at an angle of less than 25 degrees relative to the side peripheral edge 16. However, as the angle of the portion 30 relative to the edge 16 is decreased, the angle between the portion 30 and the top edge 18 is correspondingly increased. In turn, a wider angle between the portion 30 and the top edge 18 means that the spout opening 44 can be inserted into the neck 42 of the container 40 to a corresponding lesser depth. Since the spout 34 is flexible, the greater the depth of insertion of the spout opening 44 into the neck 42, the lesser is the risk that the spout opening 44 will fall out of the neck 42 in the event that the pouch 10 is jostled during refilling of the container 40. Thus a smaller angle between the portion 30 and the edge 18 will reduce the risk of spillage for a given neck diameter of the container being refilled.

In accordance with the second preferred embodiment of the invention depicted in Figures 4 to 6, the pouch 110 is constructed from two sheets 112 of flexible wall material which are bonded together along their peripheral edges to form a closed inner chamber for holding liquid. The wall material is preferably transparent or translucent plastic of a type which will not react with the ingredients in the liquid to be stored in the pouch chamber.

During manufacture, two sheets 112 of wall material having the same shape are arranged against each other with their peripheries mutually overlapping. The corresponding peripheral edges 114, 116, 118 and 120 are bonded by heat sealing, sonic welding, adhesive or like means to form a closed inner chamber of the pouch. The bottom edge 120 is gusseted along the contour 122 to enable the pouch to stand upright when filled with liquid.

Alternatively the chamber could be formed from a single sheet of wall material by folding the wall material and then bonding the overlapping portions of the periphery of the single sheet.

After the first bonding operation, recesses 124 and 125 are formed in the respective sheets of wall material by cutting along the side peripheral edges 112 and 116 respectively. Each recess has a maximum height, measured along the said peripheral side edge 116, which is greater than the maximum depth measured in a direction transverse to the direction along which the height is measured. Further, in accordance with the second preferred embodiment of the invention, each recess begins at a point spaced from the top peripheral edge 118 of the pouch. After recesses 124 and 125 are formed, the respective sheets of wall material are bonded along the edges 126 and 127 respectively of the recesses to again close off the pouch chamber.

In accordance with the second preferred embodiment of the invention, the bonded edges 126, 127 of the recesses 124, 125 have a generally semicircular shape. The recesses 124 and 125 respectively define closed pouring spouts 134 and 135.

Figure 5 depicts the refilling of a container 140 by inserting the open spout of the pouch 110 in the open neck 142. The spout 34 is opened by cutting along the line B--B (see Figure 4). The cut B--B should desirably be made at an angle of 30 to 60 degrees with respect to the top peripheral edge 118, preferably 45 degrees, and should be placed so that the top peripheral edge 118 and the rim 127 of the recess 125 are both cut. A 45-degree cut permits the liquid contents of the pouch to be readily drained through the spout opening 144 and into the neck 142 of the container 140.

In accordance with the second preferred embodiment, the recess 125 is spaced relative to the top peripheral edge 118 such that the spout opening 144 has the desired dimension when the cut B--B is made. This also applies to the spacing of the recess 124 from the top peripheral edge 118.

The provision of a second recess 124 is advantageous, but is not essential to the invention. However, because of the collapsible nature of a pouch made of flexible sheets of wall material, folds in the pouch can entrap some fluid so that the trapped fluid will not drain out of the open spout 144. In that event, the spout 134 can be opened by cutting to provide an alternate path for drainage of the previously trapped fluid from the pouch 110 nto the container to be refilled.

The second recess can be formed simultaneously with formation of the first recess in the pouch. Moreover, if the pouches are formed in

succession by bonding sheet material unrolled from continuous webs, the recesses in different pouches can be advantageously formed simultaneously.

Numerous modifications are possible in the light of the above disclosure. For example, the preferred pouch 10 includes sheets walls 12 which are bonded together at their peripheral edges 14-20 to define an inner chamber. A bottom edge 20 is gusseted along the contour 30 to provide a self-standing feature. Alternatively, the pouch could be formed from a single folded sheet bonded at its overlapping edges, and a contoured gusseted insert. Similarly, although the spout 34 is preferably opened by a cut A--A at a 45-degree angle relative to the peripheral edge 18, this angular relation is not critical.

In accordance with the third preferred embodiment of the invention depicted in Figures 7 to 9, pouch 210 is constructed from two sheets 212 of flexible wall material which are sealed together along their peripheral edges to form a closed inner chamber for holding liquid. The wall material is preferably transparent or translucent plastic of a type which will not react with the ingredients in the liquid to be stored in the pouch chamber.

During manufacture, two sheets 212 of wall material having the same shape are arranged against each other with their peripheries mutually overlapping. The corresponding peripheral edges 214, 216, 218 and 220 are bonded by heat sealing, sonic welding, adhesive or like means to form a closed inner chamber of the pouch. The bottom edge 220 may be gusseted along the contour 230 to enable the pouch to stand upright when filled with liquid.

Alternatively, the chamber could be formed from a single sheet of wall material by folding the wall material and then bonding the overlapping portions of the periphery of the single sheet.

After the first bonding operation, a recess 234 is formed in the respective sheets of wall material by cutting into the side peripheral edge 216. This recess has a maximum height measured along the said side peripheral edge 216 which is greater than the maximum depth measured in a direction transverse to the direction along which the height is measured. Further, in accordance with the first preferred embodiment of the invention, the recess begins at a point spaced from the top of the pouch. After the recess 234 is formed, the respective sheets of wall material are bonded by heat sealing, sonic welding, adhesive or like means along the rim of the recess to again close off the pouch chamber.

In accordance with this preferred embodiment of the invention, the bonded edge of the recess 234 has a generally iwnardly curved portion 228 with generally straight portions 226 and 232 extending therefrom. The portion 226 is substantially parallel to top peripheral edge 218 of the pouch.

The recess 234 defines a closed pouring spout 224. The contour depicted in Figure 7 maximizes the storage capacity of the pouch, enhances the structural strength at the pouring spout and permits refilling of containers having necks of different diameters.

Figure 8 depicts the refilling of a container 242 by inserting the open spout of pouch 210 in open neck 240. The spout 224 is opened by cutting along line A--A (see Figure 7). The cut A--A should preferably be made at an angle of 30 to 60 degrees with respect to the top peripheral edge 218, more preferably 45 degrees. A 45-degree cut permits the liquid contents of the pouch to be readily drained through spout opening 236 and into neck 240 of container 242.

In accordance with a fourth preferred embodiment of the invention depicted in Figure 10, pouch 210 is constructed from two sheets 212 of flexible wall material which are bonded together along their peripheral edges to form a closed inner chamber for holding liquid. The wall material is preferably transparent or translucent plastic of a type which will not react with the ingredients in the liquid to be stored in the pouch chamber.

During manufacture, two sheets 212 of material having the same shape are arranged against each other with their peripheries mutually overlapping. The corresponding peripheral edges 214, 216, 218 and 220 are bonded to form a closed inner chamber of the pouch. The bottom edge 220 may be gusseted along the contour 230 to enable the pouch to stand upright when filled with liquid.

After the first bonding operation, the recesses 234 and 235 are formed in the respective sheets of wall material by cutting along side peripheral edges 216 and 214 respectively. Each recess has a maximum height measured along the said side peripheral edge 214 or 216 which is greater than the maximum depth measured in a direction transverse to the direction along which the height is measured. Further, in accordance with the embodiment of Figure 10, each recess begins at a point spaced from the top peripheral edge 218 of the pouch. After recesses 234 and 235 are formed, the respective sheets of wall material are bonded along the edges of the recesses to again close off the pouch chamber. Recesses 234 and 235 respectively define closed pouring spouts 224 and 225.

The second recess can be formed simultaneously with formation of the first recess in the pouch. Moreover, if the pouches are formed in succession by bonding sheet material unrolled from continuous webs, the recesses in different pouches can be advantageously formed simulta-

neously.

The walls can be formed from 12-micron-thick polyethylene terephthalate film laminated to 152-micron-thick linear low-density polyethylene film, whereas the reinforcement strip with stiffening rib can be formed with a 150-micron-thick polyethylene strip secured to the walls by adhesive. The dimensions of the pouch in a preferred embodiment are as follows: width -- 130 mm; height -- 230 mm; width of juncture -- 5 mm; height of spout -- 18 mm; length of reinforcing strip -- 11.5 cm (115 mm); width of stiffening rib -- 1.2 mm.

Claims

1. A flexible pouch (10) for storing liquids having at at least one corner thereof a configuration (34) of spout-like shape adapted, on being cut across the said configuration, to afford a spout.

2. A pouch as claimed in Claim 1 in which the said corner is defined by edges (16,18) inclined to each other and the spout-like configuration is afforded by a recess (24) in at least one of the said edges.

3. A flexible self-standing pouch for storing liquid therein, comprising first and second wall means (12) made of nonrigid sheet material, the said first wall means having a first peripheral edge (14-20) and the said second wall means having a second peripheral edge (14-20), the said first peripheral edge being bonded to the said second peripheral edge to form a sealed juncture, the said first and second wall means and the said sealed juncture defining a closed chamber, the said juncture comprising a top portion (18) connected to a first side portion (16), the said first side portion in turn comprising an inwardly curved portion which defines at least part of a recess (24) in the said pouch, opposing portions of the said first and second wall means forming a spout portion suitable for use as a spout when the said opposing portions of the said wall means are cut along a line extending from a point along the said recess to a point along the top of the pouch.

4. A pouch as claimed in Claim 2, characterized in that the said recess has a maximum height which is greater than the maximum depth measured in a direction transverse to the direction along which the height is measured.

5. A pouch as claimed in Claim 3 or Claim 4, characterized in that the said first and second wall means are not integrally connected and the said juncture has a closed contour.

6. A pouch as claimed in Claim 3, 4 or 5, characterized in that the said juncture further comprises a second side portion (14) connected to the said top portion and a bottom portion (20) connected to the said first and second side portions.

7. A pouch as claimed in any one of Claims 1 to 6, characterized in that the said pouch is gusseted (22,122).

8. A pouch as claimed in any one of Claims 2 to 7, characterized in that the said recess has a semicircular configuration (124,125) and is spaced a predetermined distance from an end of the said top portion.

9. A pouch as claimed in any one of Claims 3 to 8, characterized in that the said first side portion further comprises first and second substantially straight portions connected to the said inwardly curved portion, the said first substantially straight portion being arranged adjacent to an end of the said top portion.

10. A pouch as claimed in Claim 9, characterized in that the said top portion is substantially straight, the said top portion and the said first substantially straight portion forming an angle therebetween which is less than 90 degrees.

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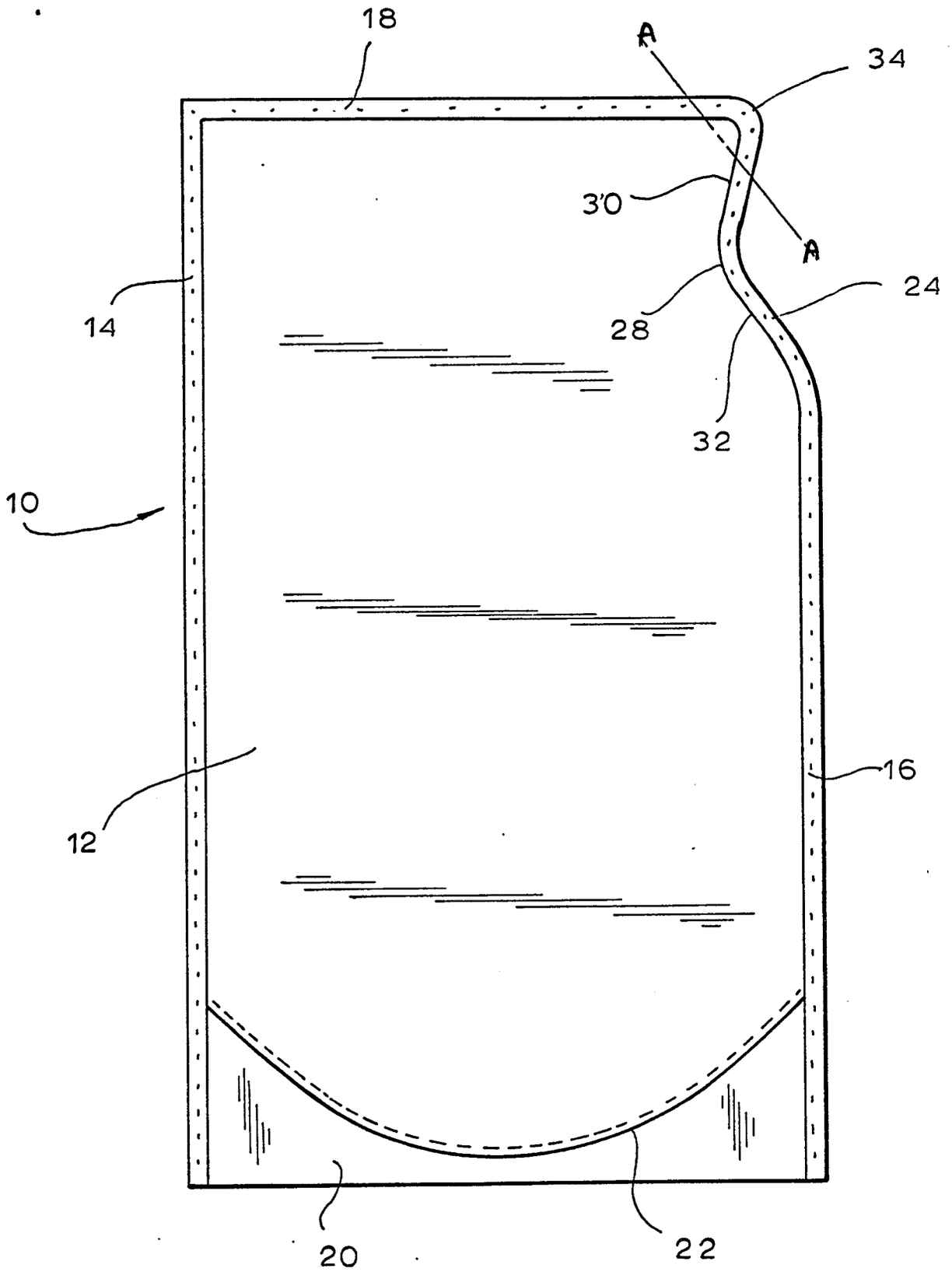

FIG. 1

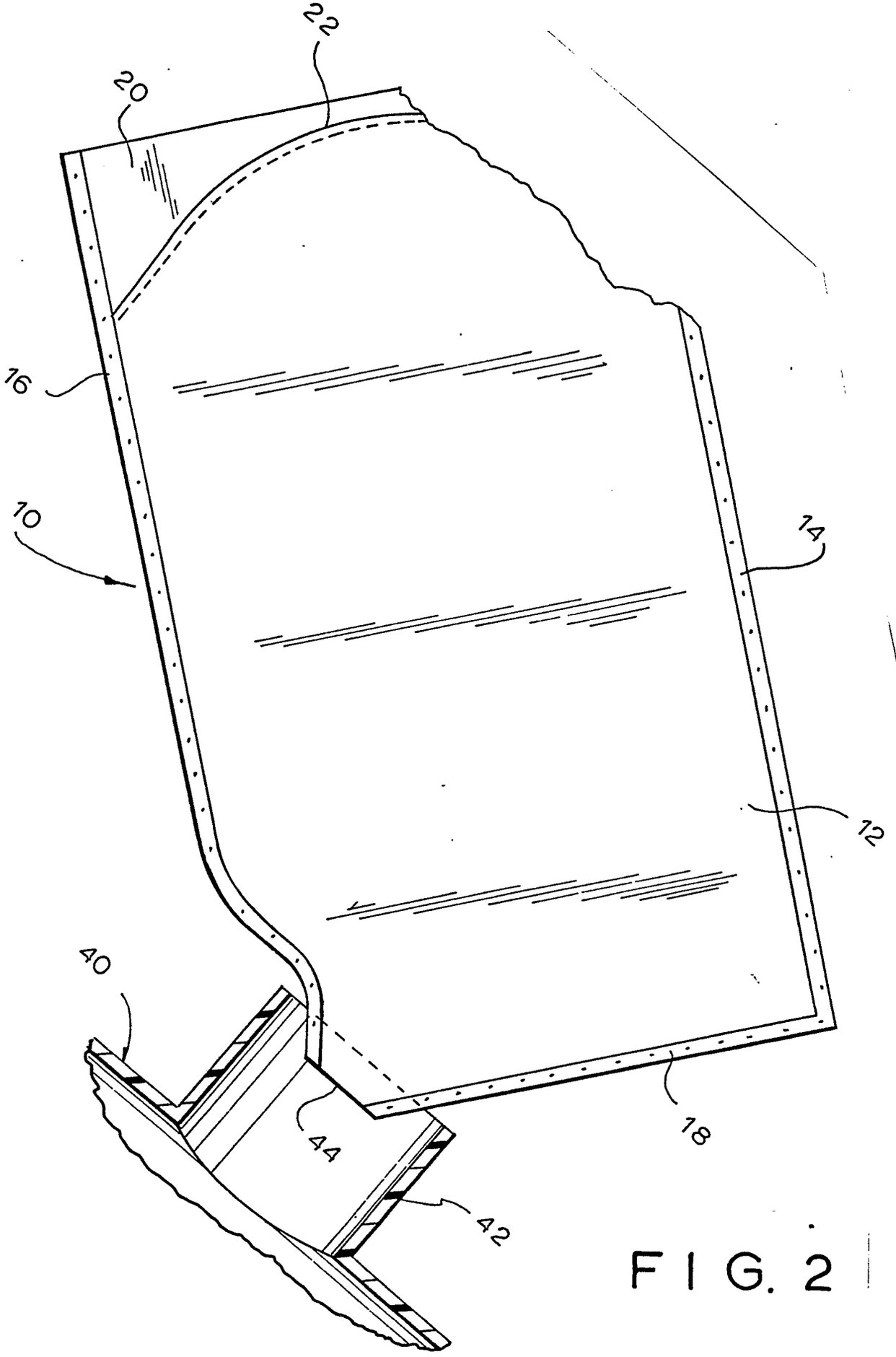

FIG. 2

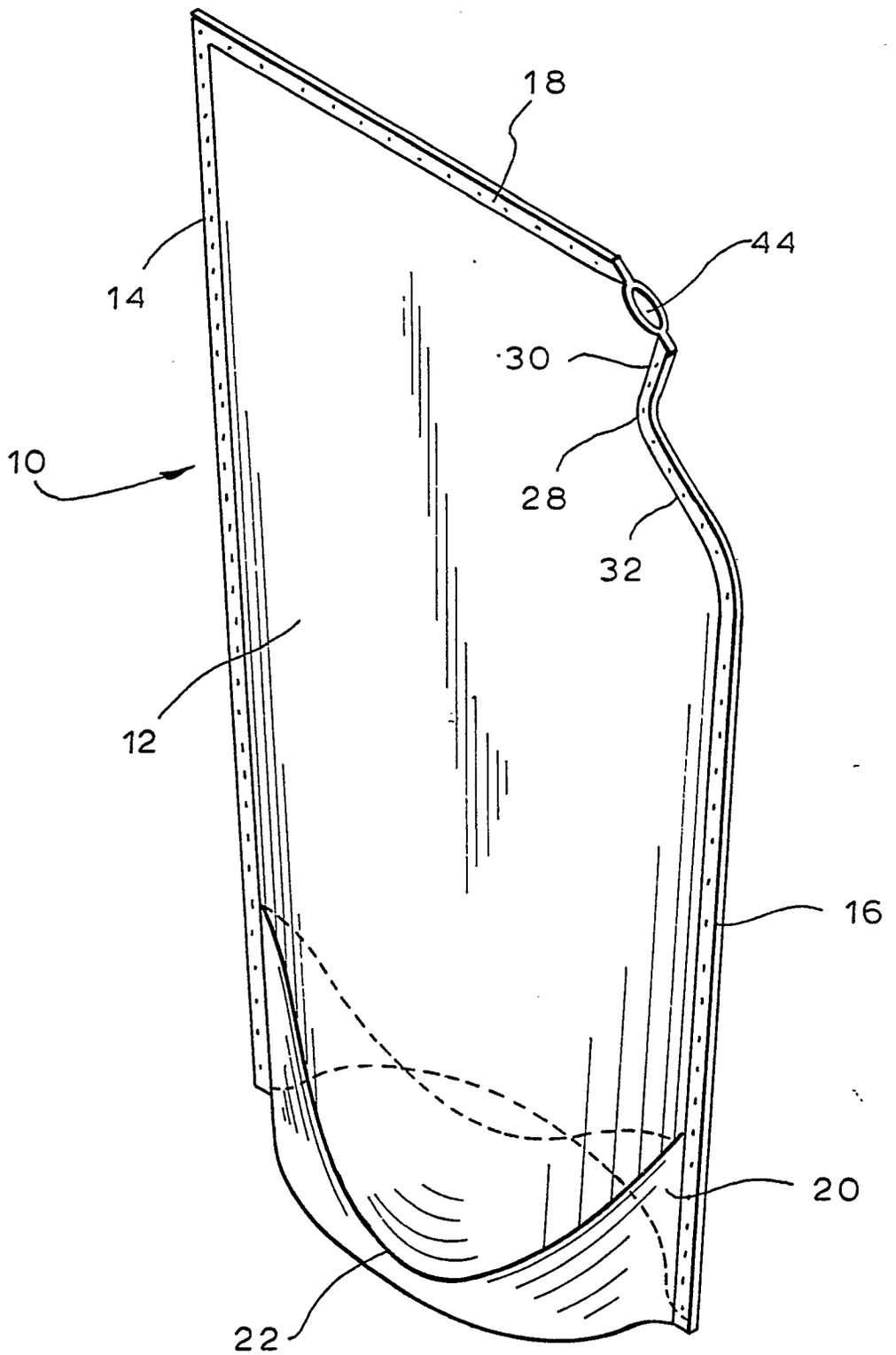

FIG. 3

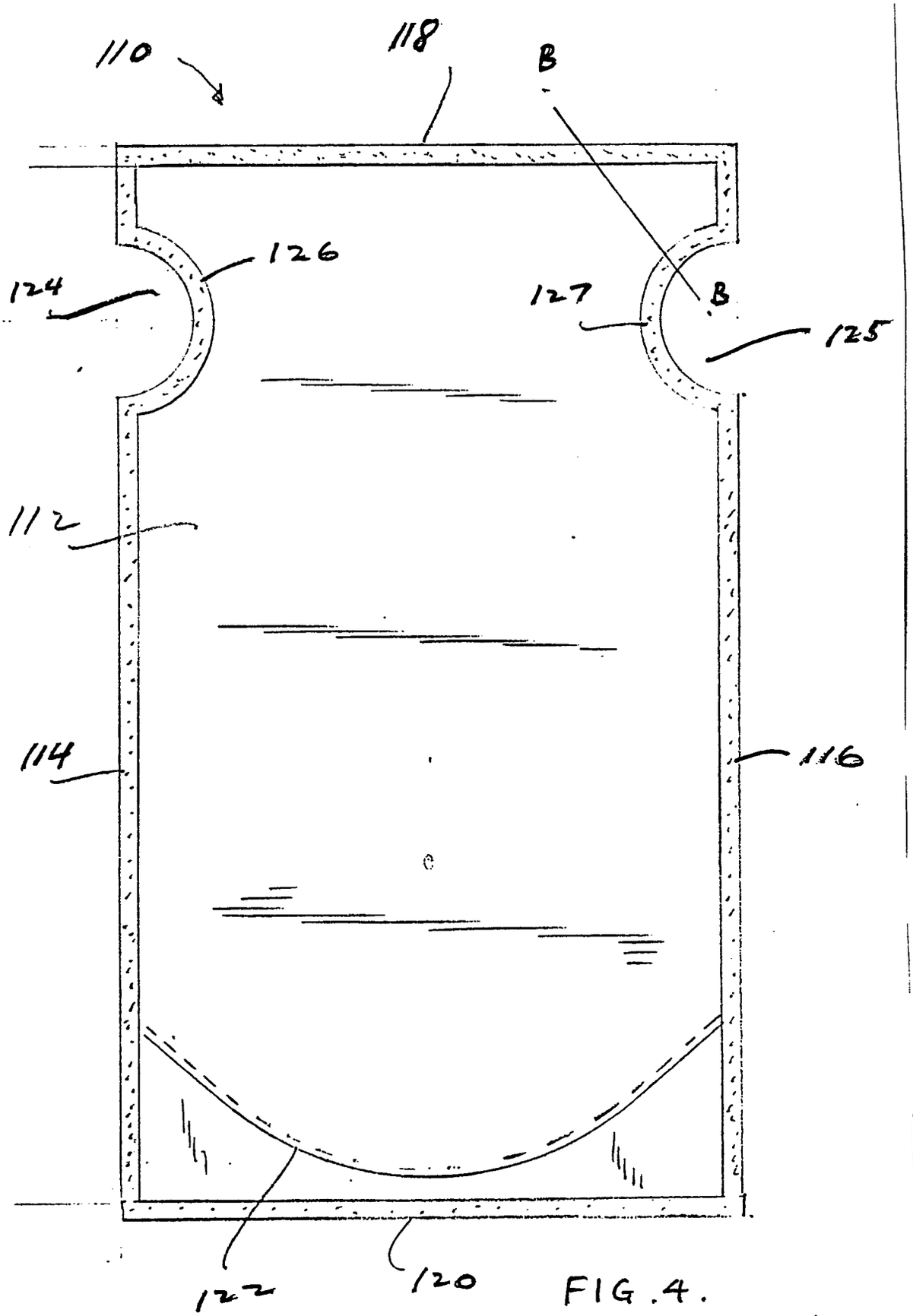

FIG. 4.

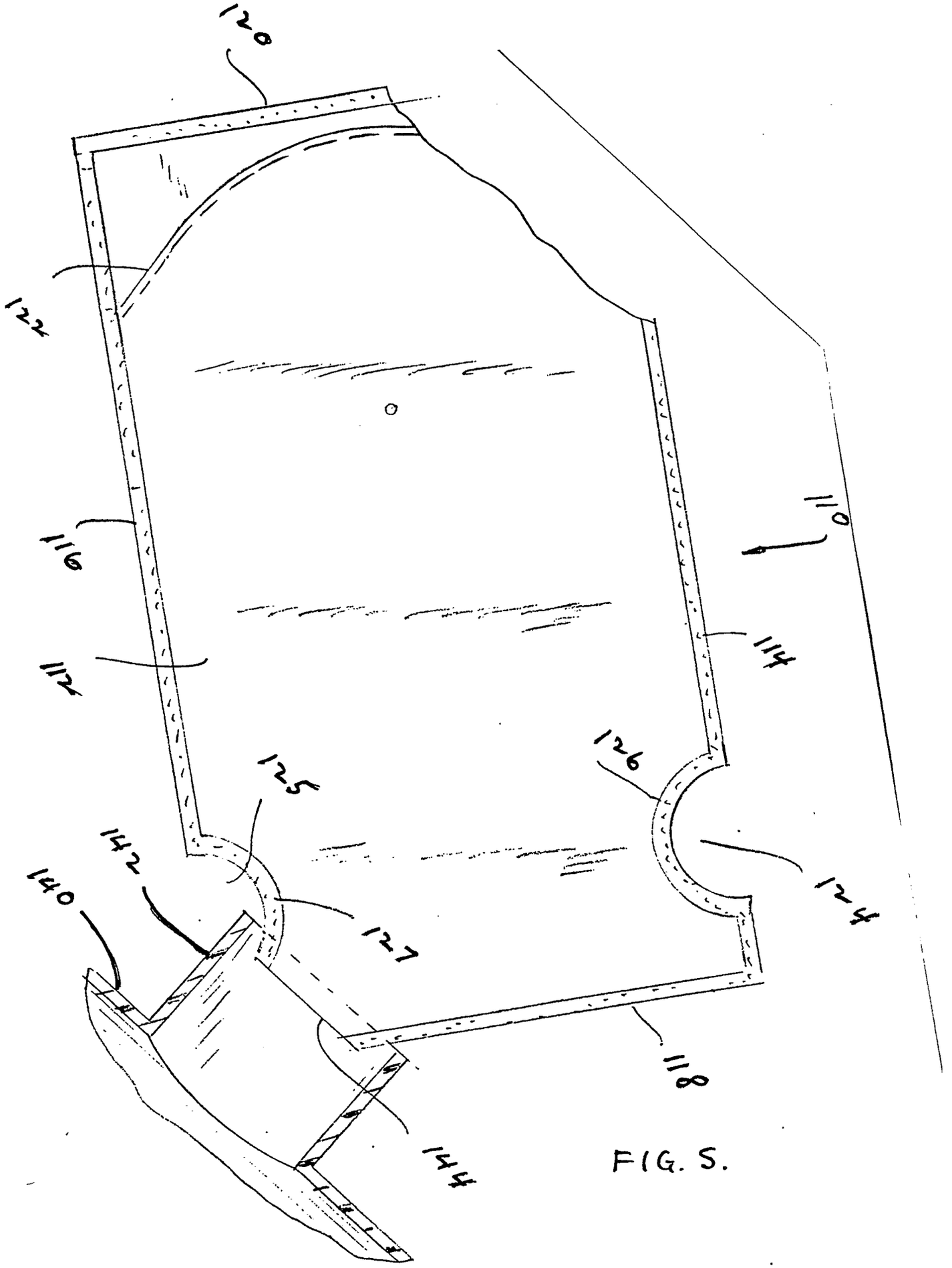

FIG. 5.

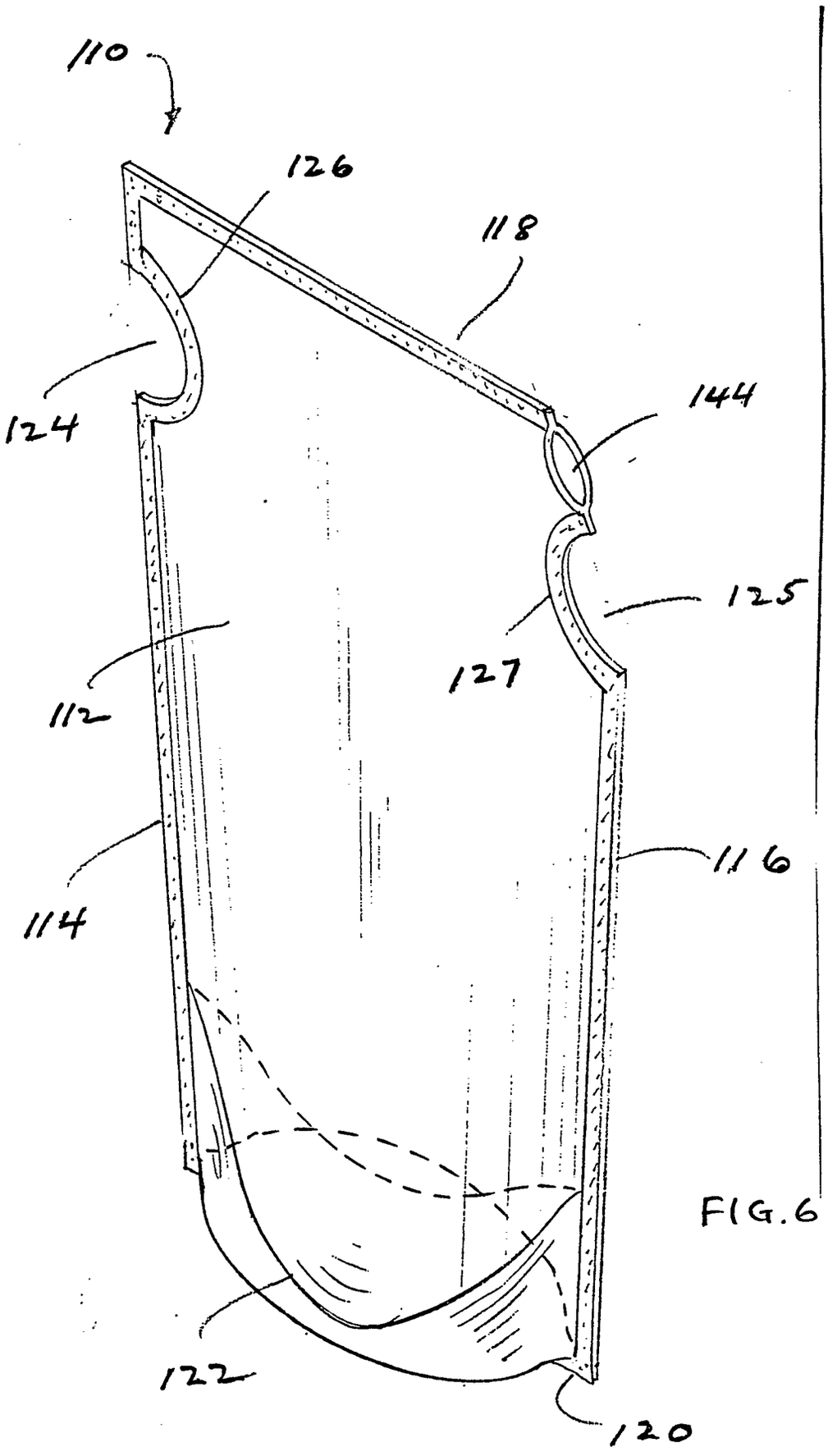

FIG.6.

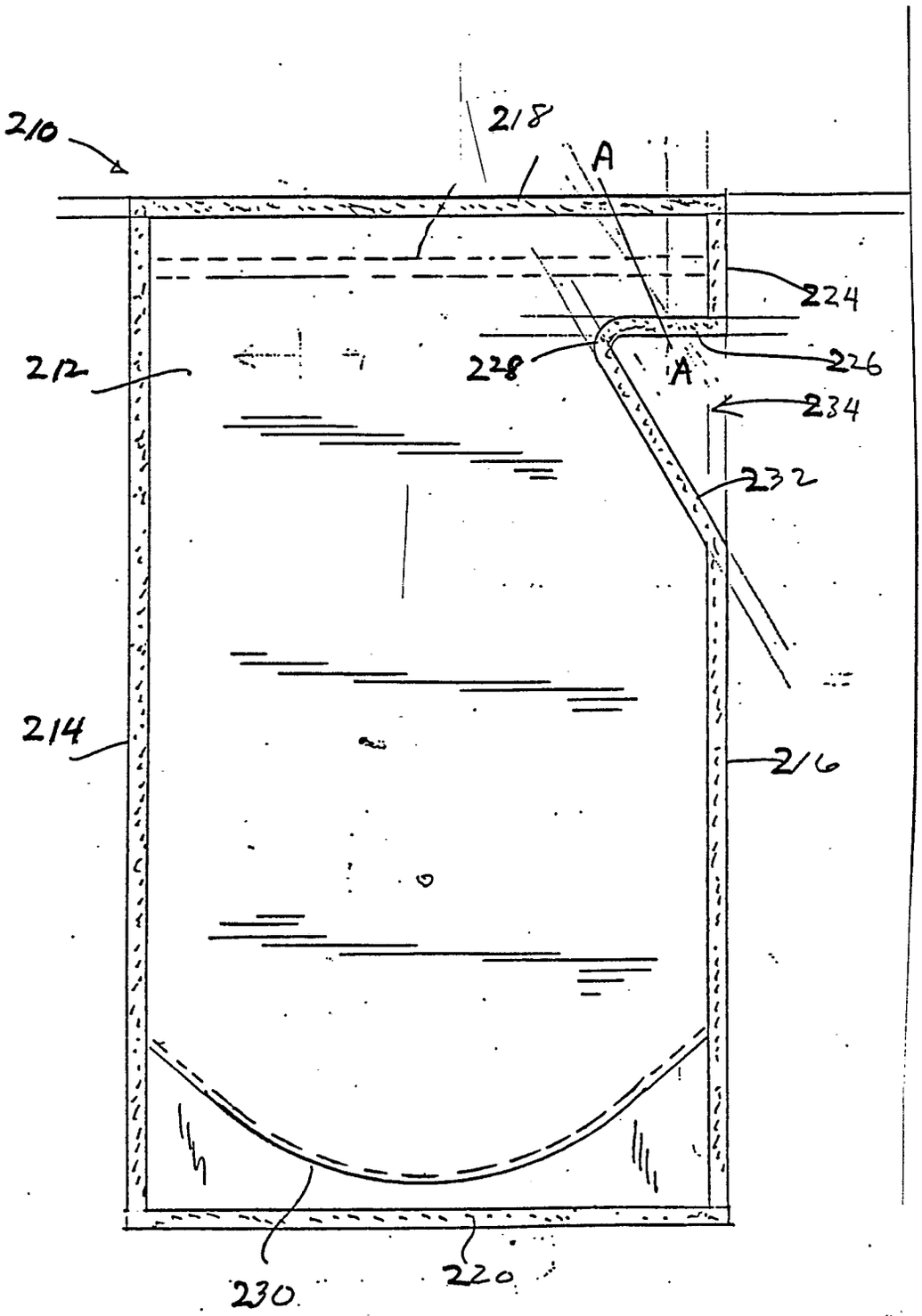

FIG.7.

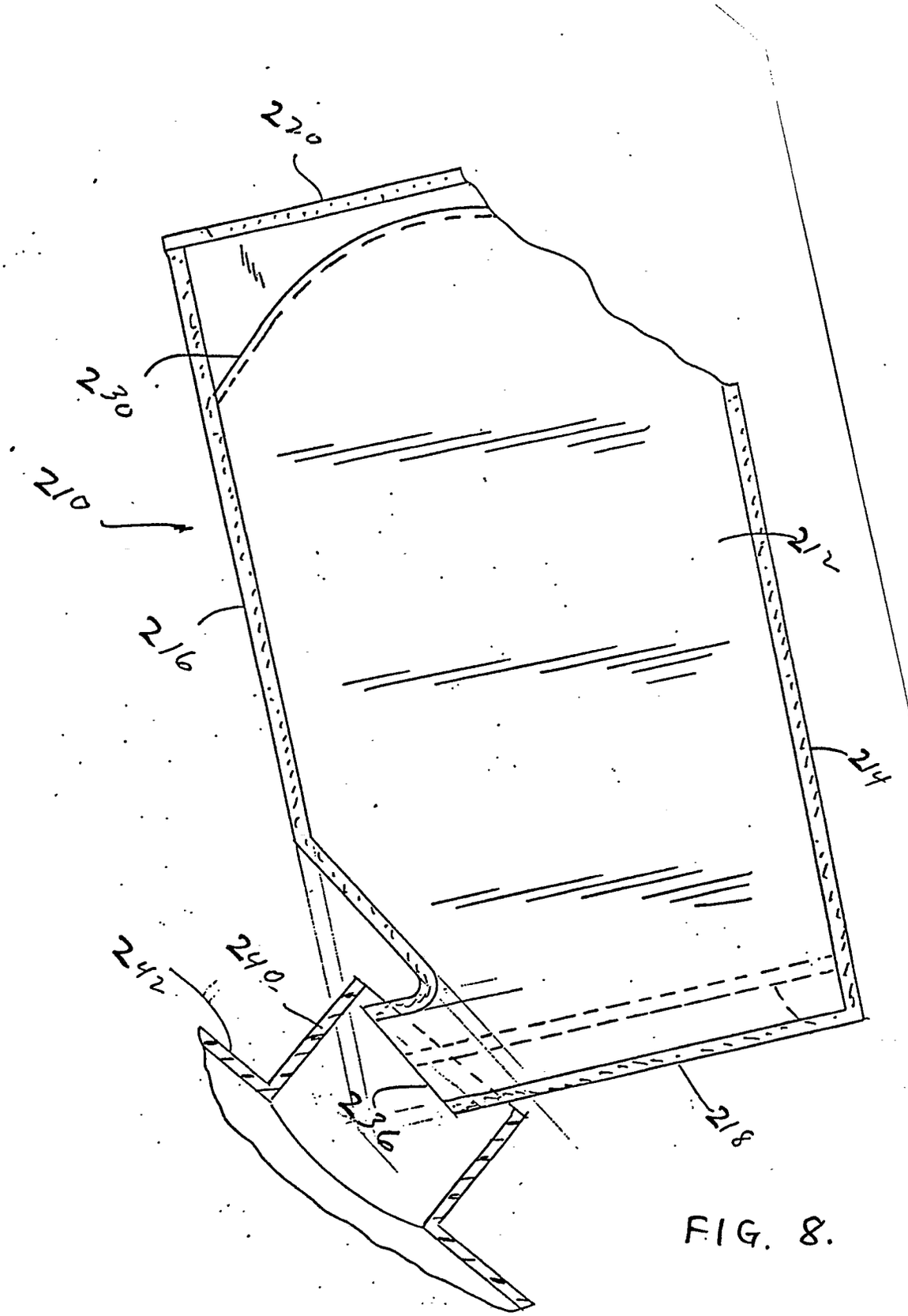

FIG. 8.

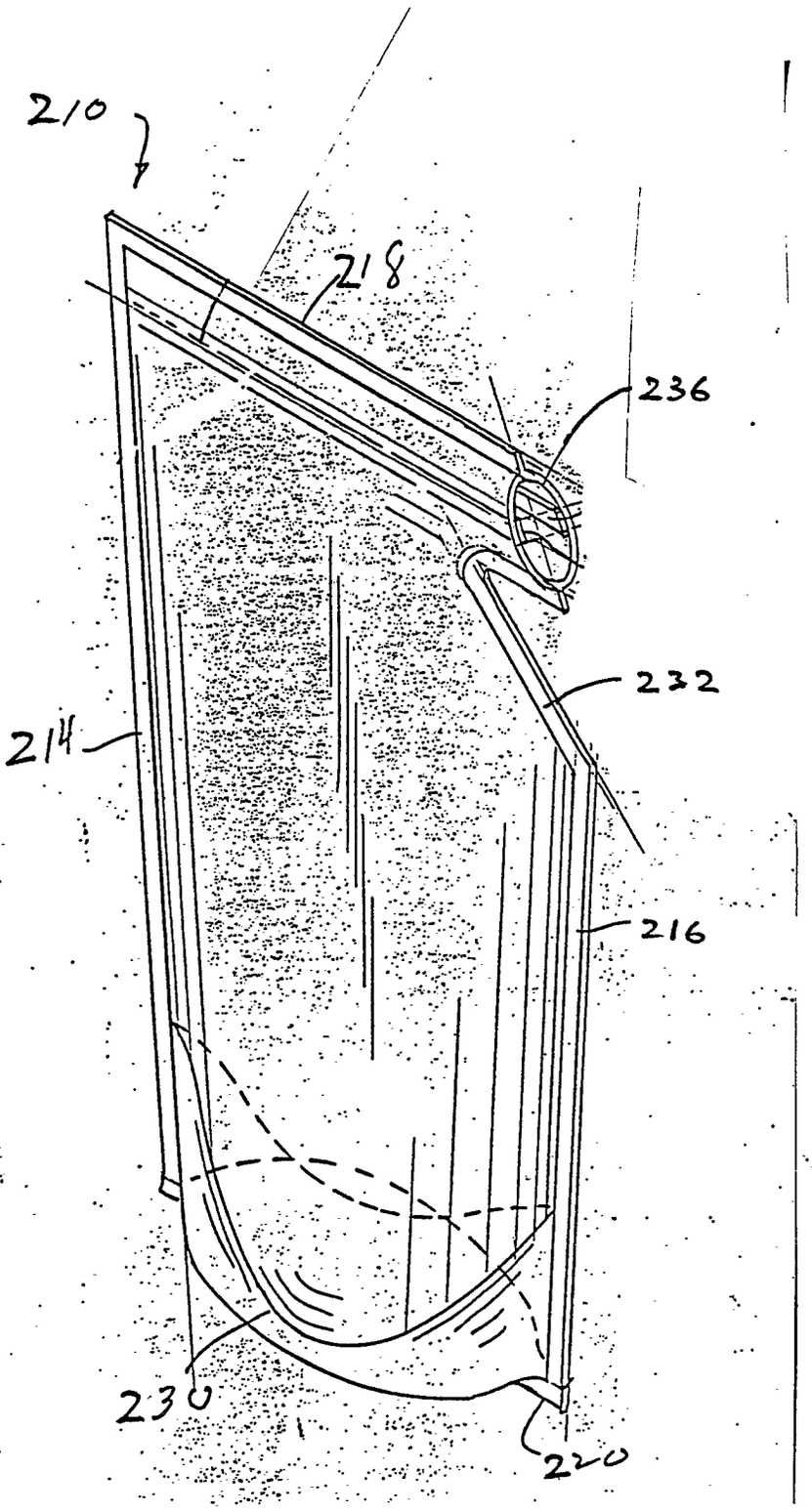

FIG. 9.

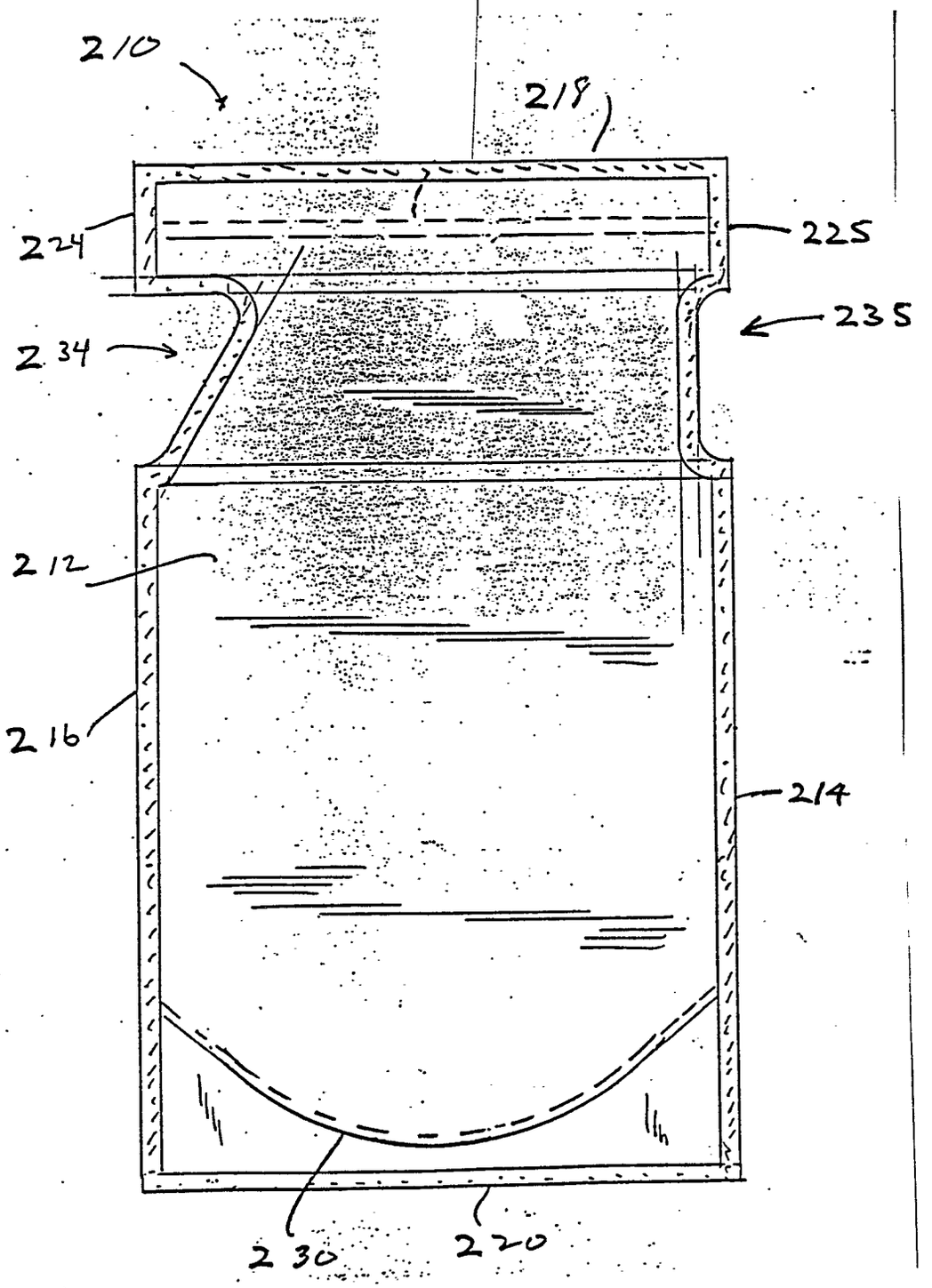

FIG. 10.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 30 3022

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)
X	FR-A-1 206 053 (MORETTI) * Page 2, left-hand column, paragraph 13; right-hand column, paragraph 2; figure 1 *	1,2,4,6,9,10	B 65 D 30/00 B 65 D 33/38
X	AU-B- 550 138 (PURCIVAL) * Page 2, line 29 - page 3, line 7; fig. *	1,2,4-6	
A		9,10	
X	US-A-3 412 918 (SHERMAN) * Column 1, line 56 - column 2, line 9; figures 1,2 *	1-3,6,7	
X	GB-A- 690 614 (RADIO HEATERS) * Page 2, lines 23-32; figure 3 *	1,2,4,6,8	
X	DE-A-1 586 766 (KALLE) * Page 6; figures 1-3 *	1,2,7	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 65 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28-06-1990	LEONG C.Y.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P0401)