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(54) **A METHOD AND APPARATUS FOR FILLING A POUCH**

(57) There is described a method of filling a flat pouch, the method comprising: folding a lower portion of the pouch relative to an upper portion about a fold line; forming a shaped fold by lifting a central region of the folded lower portion such that distal regions of the lower portion on either lateral side of the central region slope downwards away from the central region, wherein the

shaped fold is configured to maintain the pouch in an open configuration in which first and second layers of the pouch are separated over a top edge to form an opening into a cavity of the pouch; and filling the cavity of the pouch with product via the opening. An associated apparatus for performing the method is also described.

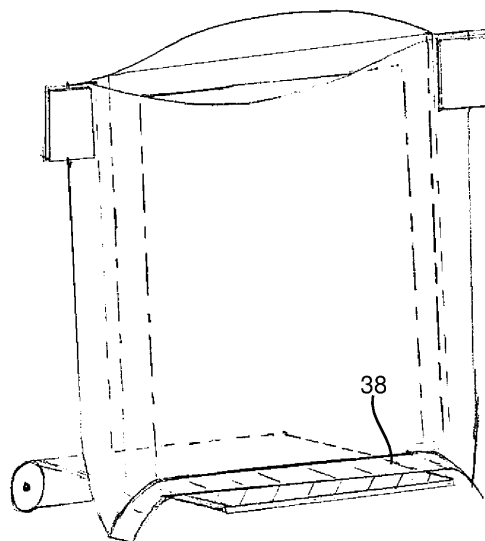


FIG. 9

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Description

BACKGROUND OF THE INVENTION

[0001] Flexible pouches are commonly used for packaging edible and non-edible items and have particular application in the packaging of pet food. In its simplest form, a flat pouch (i.e., a three-side seal pouch) is formed by two layers of packaging material which are sealed along three sides. The pouch can be filled through the fourth side which is subsequently sealed to enclose the contents.

[0002] Such pouches are often formed from packaging materials which have a laminated structure formed by multiple layers of different material which have desirable properties. For example, the packaging material may comprise an outer layer of Polyethylene Terephthalate (PET) which can be easily printed on, an aluminium foil (or metallised (e.g., MET-PET) film) layer which provides gas, aroma and water vapour barrier properties and a Polyethylene (PE) inner layer to provide a reliable seal. Such packaging materials are able to retain their form which can be beneficial during filling.

[0003] Such packaging materials are typically more difficult to recycle. It is therefore desirable to use mono-materials to improve sustainability. However, these materials have poor dead-fold properties which can make filling more problematic.

[0004] It is therefore desirable to provide a method and apparatus for filling a flat pouch which addresses or alleviates these issues.

SUMMARY OF THE INVENTION

[0005] According to an aspect, there is provided a method of filling a flat pouch, the method comprising: folding a lower portion of the pouch relative to an upper portion about a fold line; forming a shaped fold by lifting a central region of the folded lower portion such that distal regions of the lower portion on either lateral side of the central region slope downwards away from the central region, wherein the shaped fold is configured to maintain the pouch in an open configuration in which first and second layers of the pouch are separated over a top edge to form an opening into a cavity of the pouch; and filling the cavity of the pouch with product via the opening.

[0006] The method may further comprise forming a crease between the lower portion and the upper portion which forms the fold line.

[0007] The lower portion may be folded such that it extends perpendicularly to the upper portion.

[0008] The central region may be lifted by a fold forming plate which rotates and/or translates between a first stowed position and a second deployed position.

[0009] The fold forming plate may also fold the lower portion about the fold line.

[0010] The fold forming plate may rotate about an axis.

[0011] The axis may be positioned above the level of the fold line.

[0012] The first and second layers of the pouch may be separated over the top edge prior to forming the shaped fold.

[0013] The first and second layers of the pouch may be separate by a pair of vacuum cups which engage the first and second layers respectively and move away from one another in order to open the pouch.

[0014] The method may further comprise, prior to folding the lower portion, inserting a guide into the cavity of the pouch so as to prevent the upper portion from being deflected when the lower portion is folded relative to the upper portion.

[0015] The guide may be configured to receive the fold forming plate when in the second deployed position.

[0016] The guide may comprise a pair of fingers which are spaced laterally from one another such that the fold forming plate can be received therebetween.

[0017] The fold line may be adjacent to a bottom of the cavity.

[0018] Each of the first and second layers may be formed from a mono material.

[0019] According to an aspect, there is provided a pouch filling apparatus configured to perform the method of described above.

BRIEF DESCRIPTION OF DRAWINGS

[0020] For a better understanding of the invention, and to show more clearly how it may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

Figure 1 is a perspective view of a packaging pouch; Figure 2 is a side view of the pouch and showing a creasing assembly;

Figure 3 is a perspective view of the pouch being held by a pair of grippers;

Figure 4 is a perspective view of the pouch and an opening apparatus;

Figure 5 is a perspective view of the pouch and an air nozzle;

Figure 6 is a perspective view of the pouch and showing a guide before insertion into the pouch;

Figures 7 and 8 are perspective and side views of the pouch and a fold forming plate in a stowed position; Figure 9 and 10 are perspective and side views of the pouch and the fold forming plate in a deployed position;

Figure 11 is a perspective view of the pouch and a filling nozzle;

Figure 12 is a front view of the pouch and a heat-sealing apparatus;

Figure 13 is a front view of the sealed pouch; and Figure 14 is a flowchart of a method.

DETAILED DESCRIPTION OF THE INVENTION

[0021] Figure 1 shows a packaging pouch 2 which may be used with the method and apparatus of the present disclosure.

[0022] The pouch 2 is a flat pouch and comprises a first layer 4 of flexible packaging material and a second layer 6 of flexible packaging material. The first and second layers 4, 6 may be formed from the same material or from different materials. The first and second layers 4, 6 may be formed from a laminated composite material or from a mono-material.

[0023] The first and second layers 4, 6 are sealed along a bottom edge 8 and along opposing side edges 10a, 10b to form a cavity 12 which is left open along a top edge 14 to allow filling. The cavity 12 has a width W_1 measured between the opposing side edges 10a, 10b and a depth D_1 measured from the top edge 14 to the bottom edge 8.

[0024] The pouch 2 may be filled using a method and apparatus according to the present disclosure, as will be described below.

[0025] As shown in Figure 2, the apparatus comprises a creasing assembly. The creasing assembly comprises a female creasing platen 16 and a male creasing rule 20. The female creasing platen 16 comprises a groove 20 which is sized to receive a corresponding rib 19 provided on the male creasing rule 18. As shown in Figure 2, the pouch 2 is located between the female creasing platen 16 and the male creasing rule 18. The pouch 2 is arranged such that the groove 20 runs parallel to the bottom edge 8 and at or adjacent to the bottom of the cavity 12.

[0026] The male creasing rule 18 is brought towards the female creasing platen 16 and the rib 19 is received in the groove 20, thereby forming a crease 22 extending across the pouch 2, as seen in Figure 3. The crease 22 forms a fold line, as will be described further below.

[0027] As shown in Figure 3, the apparatus further comprises a pair of grippers 24a, 24b. The grippers 24a, 24b each comprise a pair of gripping jaws which are actuatable to selectively grip the pouch 2 against the first and second layers 4, 6. As shown, the grippers 24a, 24b grip the pouch 2 along the side edges 10a, 10b and adjacent the top edge 14.

[0028] As shown in Figure 4, the apparatus further comprises a pair of vacuum cups 26a, 26b which are provided on arms 27a, 27b.

[0029] The vacuum cups 26a, 26b are brought into contact with the first and second layers 4, 6 respectively adjacent to the top edge 14. The vacuum cups 26a, 26b engage the first and second layers 4, 6 via suction and move away from one another in order to open the pouch 2 by separating the first and second layers 4, 6 over the top edge 14. Further, to allow the first and second layers 4, 6 to be separated, the grippers 24a, 24b move towards one another, as shown. The movement of the grippers 24a, 24b may be actively controlled (e.g., using a suitable actuator) or passively controlled in response to the separation of the first and second layers 4, 6 creating a force

which draws the grippers 24a, 24b towards one another.

[0030] As shown in Figure 5, the apparatus may further comprise an air nozzle 28. The air nozzle 28 blows a jet of air into the cavity 12 in order to further space the first and second layers 4, 6 along the length of the cavity 12.

[0031] As shown in Figure 6, the apparatus further comprises a guide 30. The guide 30 comprises a pair of fingers 32a, 32b which are laterally spaced from one another. The fingers 32a, 32b define an inner width W_2 between opposing inwardly facing surfaces and an outer width W_3 between respective outwardly facing surfaces.

[0032] With the pouch 2 open, the guide 30 is inserted into the cavity 12. The outer width W_3 corresponds to (i.e., is slightly smaller than) the width W_1 of the cavity 12.

Accordingly, the fingers 32a, 32b are received within the cavity 12 and extend parallel to the side edges 10a, 10b. The guide 30 is inserted such that the fingers 32a, 32b extend into or towards bottom corners of the cavity 12 (which may be rounded in some examples), as shown in Figure 7. It will be appreciated that in other examples, the fingers 32a, 32b may be formed separately and not as part of a common guide 30.

[0033] With the fingers 32a, 32b in position, a fold forming plate 34 is brought under the bottom edge 8 of the pouch 2, as shown in Figure 7. The fold forming plate 34 is pivotably mounted about an axis 36. The axis 36 is located at or towards an edge of the fold forming plate 34 and is parallel but offset from a plane of the pouch 2.

[0034] The fold forming plate 34 is rectangular and has a width W_4 which is smaller than the inner width W_2 between the fingers 32a, 32b.

[0035] The fold forming plate 34 has a first, stowed position in which the fold forming plate 34 is angled downwards, as shown in Figures 7 and 8. For example, in the first position, the fold forming plate 34 may be angled downwards at 30 degrees from a horizontal direction (i.e., 120 degrees from a vertical direction; at the 4 o'clock position, as viewed in Figure 8). The fold forming plate 34 has a second, deployed position in which the fold forming plate 34 is angled horizontally, as shown in Figures 9 and 10. In other examples, the fold forming plate 34 may be angled upwards in the second position. For example, in the second position, the fold forming plate 34 may be angled upwards at 30 degrees from the horizontal direction (i.e., 60 degrees from the vertical direction; at the 2 o'clock position).

[0036] In the first position, the fold forming plate 34 is spaced from bottom edge 8 of the pouch 2. The fold forming plate 34 is rotated about the axis 36 towards the second position by a suitable actuator. During the transition from the first position to the second position, the fold forming plate 34 is brought into contact with the bottom edge 8 of the pouch 2.

[0037] The continued movement of the fold forming plate 34 to the second position causes a lower portion 38 of the pouch 2 to be folded about the crease 22 into a horizontal orientation, as can be seen in Figure 9. The fingers 32a, 32b support the pouch 2 and prevent the

remainder of the pouch 2 (i.e., an upper portion) from being deflected by the action of the fold forming plate 34 and thus is maintained in a vertical orientation. The lower portion 38 therefore extends perpendicularly to the remainder of the pouch 2.

[0038] The axis 36 of the fold forming plate 34 is positioned above the level of the crease 22 formed across the pouch 2, as depicted by line 37 in Figure 7. Accordingly, as the fold forming plate 34 transitions from the first position to the second position, as well as folding the lower portion 38 about the crease 22, the fold forming plate 34 also lifts a central region of the lower portion 38 upwards.

[0039] As described previously, the width W_4 of the fold forming plate 34 is smaller than the inner width W_2 between the fingers 32a, 32b and so the fold forming plate 34 can be received between the fingers 32a, 32b. Accordingly, the fold forming plate 34 can be received between the fingers 32a, 32b in order to lift the central region of the lower portion 38.

[0040] Distal regions of the lower portion 38 on either lateral side of the central region slope downwards away from the central region. As a result of the shape of the lower portion 38, the side edges 10a, 10b of the pouch 2 are drawn towards one another over a bottom portion of the pouch 2. To allow for this, the fingers 32a, 32b may be movable such that they translate towards one another or may be rotatable such that their distal ends move towards one another.

[0041] In other examples, the fingers 32a, 32b may be (at least partially) retracted as the fold forming plate 34 moves to the second position.

[0042] In other examples, the fold forming plate 34 may first rotate about the axis 36 and may then translate upwards to lift the central region of the lower portion 38.

[0043] With the fold formed in the bottom of the pouch 2, the guide 30 can be retracted to withdraw the fingers 32a, 32b from the cavity 12 of the pouch 2 and the fold forming plate 34 can be removed, as shown in Figure 11. The fold forming plate 34 may be returned to the first, stowed position or removed entirely from the vicinity of the pouch 2.

[0044] The shape of the fold formed in the bottom of the pouch 2 is effective in maintaining the pouch 2 in the open configuration with the first and second layers 4, 6 separated over the top edge 14 and along the length of the cavity 12. The vacuum cups 26a, 26b can therefore be disengaged from the first and second layers 4, 6 of the pouch 2. It will be appreciated that in other examples the vacuum cups 26a, 26b may be disengaged earlier in the process; for example, before or once the fingers 32a, 32b of the guide 30 have been inserted into the cavity 12. Further, in other examples, the act of folding the lower portion 38 may be effective in separating the first and second layers 4, 6 such that it is not necessary to use vacuum cups 26a, 26b or the like to first open the pouch 2.

[0045] The shape of the fold formed in the lower portion 38 of the pouch 2 has been found to provide a stable

geometry such that the fold is retained even after removal of the fold forming plate 34. The fold is effectively retained even with sustainable mono-materials which typically have poor dead-fold properties and can thus spring back to their original position.

[0046] As shown in Figure 11, the apparatus further comprises one or more fill nozzles 44. With the pouch 2 held in the open configuration by the fold formed in the bottom of the pouch 2, the pouch 2 can be filled with product via the or each nozzle 44. For example, the pouch 2 may be used for packaging pet food, with a first fill nozzle 44 delivering a liquid, such as gravy, and a second fill nozzle 44 delivering solids, such as meat, to the pouch 2. In other examples, a single nozzle 44 may be used to supply both liquid and solids to the pouch 2 by selectively connecting different supply lines/sources.

[0047] The apparatus further comprises a heat-sealing apparatus, as shown in Figure 12. The heat-sealing apparatus comprises a pair of jaw bars 46 (only a front jaw bar 46 is visible in Figure 12). The pouch 2 is introduced between the jaw bars 46 with the first layer 4 directed towards one of the jaw bars 46 and the second layer directed towards the other jaw bar 46. The jaw bars extend across the width of the pouch 2. The pouch 2 is positioned such that the jaw bars are adjacent and parallel to the top edge 14. The jaw bars 46 are movable relative to one another such that they can be brought into contact with the first and second layers 4, 6 thereby forcing the first and second layers 4, 6 towards one another in order to close the pouch 2. One or both of the jaw bars 46 are heated such that the first and second layers 4, 6 are welded to one another along a seal line 48 (see Figure 13) adjacent the top edge 14 in order to seal the pouch 2. The jaw bars 46 may be continuously heated or intermittently heated only when the jaw bars 46 are brought together.

[0048] As described previously, the shape of the fold formed in the bottom of the pouch 2 has been found to provide a stable geometry such that the fold is retained and does not readily spring back to its original position. An unstable fold which is liable to spring back can cause the contents of the pouch 2 to be ejected upwards into the region where the seal line 48 is formed. This can cause problems with the integrity of the seal since the heat-sealing apparatus may struggle to properly weld the first and second layers 4, 6 to one another in the presence of contaminants along the seal line 48. This can therefore lead to leakage of product from pouches. Pouches may be underfilled in order to reduce the risk of contaminants being present along the seal line; however, this increases material usage. The stable geometry provided by the fold disclosed herein allows the pouch 2 to be filled to a maximum level whilst ensuring the integrity of the seal and thereby minimizes material usage.

[0049] With the pouch 2 fully sealed, the fold formed in the bottom of the pouch 2 can then be removed, as shown in Figure 13. This ensures that multiple pouches 2 can be packaged together for efficient transportation and dis-

play.

[0050] Figure 14 shows a flow chart of an exemplary method of filling a flat pouch according to the present disclosure.

[0051] In a first step, S2, a lower portion of the pouch is folded relative to an upper portion about a fold line. A crease may be pre-formed between the lower portion and the upper portion which forms the fold line. The lower portion may be folded such that it extends perpendicularly to the upper portion. As described previously, a guide may be inserted into the cavity of the pouch so as to prevent the upper portion from being deflected when the lower portion is folded relative to the upper portion.

[0052] In a second step, S4, a central region of the lower portion is lifted to form a shaped fold with distal regions of the lower portion on either lateral side of the central region sloping downwards away from the central region. The shaped fold is configured to maintain the pouch in an open configuration in which first and second layers of the pouch are separated over a top edge to form an opening into a cavity of the pouch.

[0053] The central region may be lifted by a fold forming plate, as described previously, which rotates and/or translates between a first stowed position and a second deployed position. The fold forming plate may also fold the lower portion about the fold line. For example, the fold forming plate may fold and shape the lower portion in a single motion or may perform a first motion to fold the lower portion and a second motion to shape the fold.

[0054] In a third step, S6, the pouch can then be filled with product via the opening.

[0055] It will be appreciated that the method may be implemented using an apparatus as described previously.

[0056] It will be appreciated that the method and apparatus may be modified from that described above.

[0057] The various features of the apparatus described above may be implemented in separate modules or may be integrated into a single fill and seal machine. It will be appreciated that in other examples the apparatus may be an integral form-fill-seal machine which also manufactures the pouches themselves, rather than being provided with preformed pouches for filling and sealing.

[0058] It will be appreciated that the crease 22 may be formed with the pouch 2 lying flat in a horizontal orientation on the female creasing platen 16. Alternatively, the pouch 2 may be held by the grippers 24a, 24b in a vertical orientation when the crease 22 is formed. In other examples, the fold forming plate 34 may reliably form the fold in the bottom of the pouch 2 without requiring the preformed crease 22.

[0059] The arrangement of the guide 30 may differ from that shown. For example, the bifurcated section of the fingers 32a, 32b may extend only over a distance which is sufficient to receive the fold forming plate 34 therebetween as the fold forming plate 34 moves to the second, deployed position. The guide 30 may therefore have a body portion which extends further into the pouch 2 than

shown. For example, the body portion may extend to the level of the crease 22 or, if a preformed crease is not required, to where the lower portion 38 is folded. The body portion may therefore assist with the folding of the lower portion 38.

[0060] In other examples, the upper portion of the pouch 2 may be retained in any other way. For example, external grippers may be used to hold the pouch 2 above the crease 22 and to maintain the upper portion in a vertical orientation. Such external grippers may be used in addition to or instead of the guide 30.

[0061] In other examples, a pair of external grippers may grasp the distal regions of the lower portion 38 and bend them downwards away from the central region. These external grippers may also lift the central region in the same action and thus may provide an alternative (or additional) means to the fold forming plate 34.

[0062] The relative terms "upper" and "lower" used herein are defined with respect to the opening of the pouch through which filling takes place and are not necessarily reflective of how the pouch may be subsequently oriented for display and/or use (e.g., when opened).

Claims

1. A method of filling a flat pouch, the method comprising:
 - folding a lower portion of the pouch relative to an upper portion about a fold line;
 - forming a shaped fold by lifting a central region of the folded lower portion such that distal regions of the lower portion on either lateral side of the central region slope downwards away from the central region, wherein the shaped fold is configured to maintain the pouch in an open configuration in which first and second layers of the pouch are separated over a top edge to form an opening into a cavity of the pouch; and
 - filling the cavity of the pouch with product via the opening.
2. The method of claim 1, further comprising: forming a crease between the lower portion and the upper portion which forms the fold line.
3. The method of claim 1 or 2, wherein the lower portion is folded such that it extends perpendicularly to the upper portion.
4. The method of any one of the preceding claims, wherein the central region is lifted by a fold forming plate which rotates and/or translates between a first stowed position and a second deployed position.
5. The method of claim 4, wherein the fold forming plate

also folds the lower portion about the fold line.

6. The method of claim 4 or 5, wherein the fold forming plate rotates about an axis. 5
7. The method of claim 6, wherein the axis is positioned above the level of the fold line.
8. The method of any one of the preceding claims, wherein the first and second layers of the pouch are separated over the top edge prior to forming the shaped fold. 10
9. The method of claim 8, wherein the first and second layers of the pouch are separate by a pair of vacuum cups which engage the first and second layers respectively and move away from one another in order to open the pouch. 15
10. The method of any one of the preceding claims, further comprising, prior to folding the lower portion, inserting a guide into the cavity of the pouch so as to prevent the upper portion from being deflected when the lower portion is folded relative to the upper portion. 20 25
11. The method of claim 10 when appended to claim 4, wherein the guide is configured to receive the fold forming plate when in the second deployed position. 30
12. The method of claim 11, wherein the guide comprises a pair of fingers which are spaced laterally from one another such that the fold forming plate can be received therebetween. 35
13. The method of any one of the preceding claims, wherein the fold line is adjacent to a bottom of the cavity.
14. The method of any one of the preceding claims, wherein each of the first and second layers is formed from a mono material. 40
15. A pouch filling apparatus configured to perform the method of any one of the preceding claims. 45

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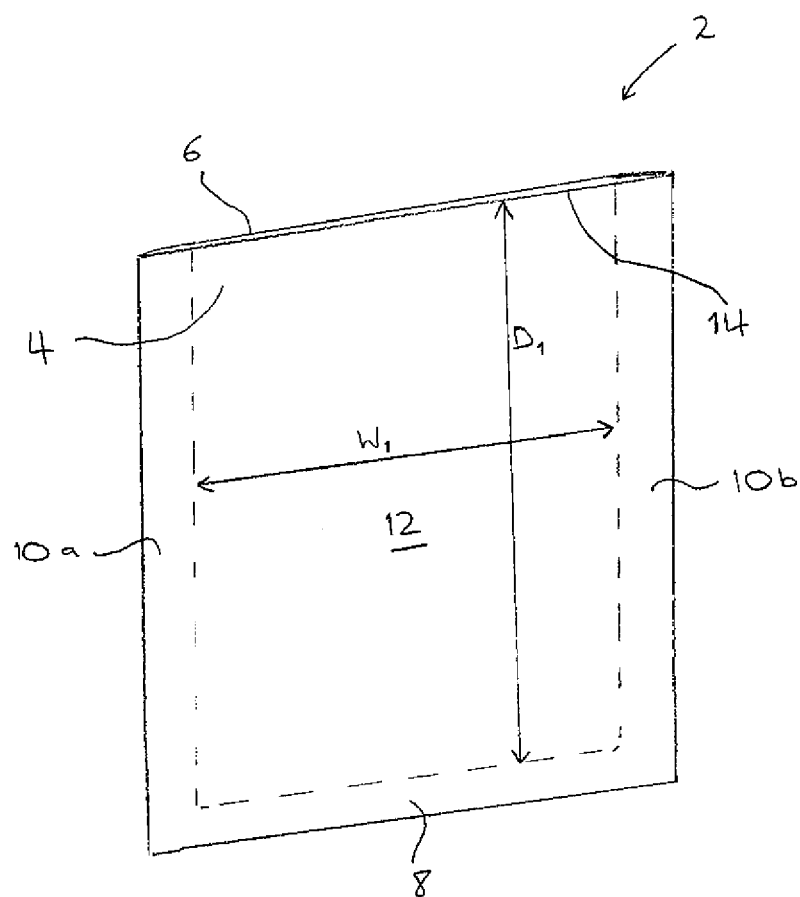


FIG. 1

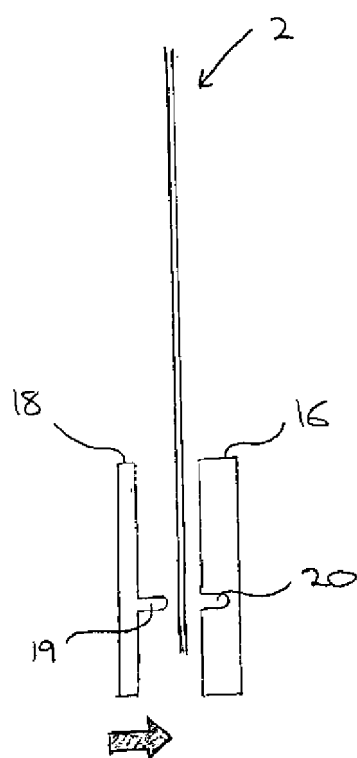


FIG. 2

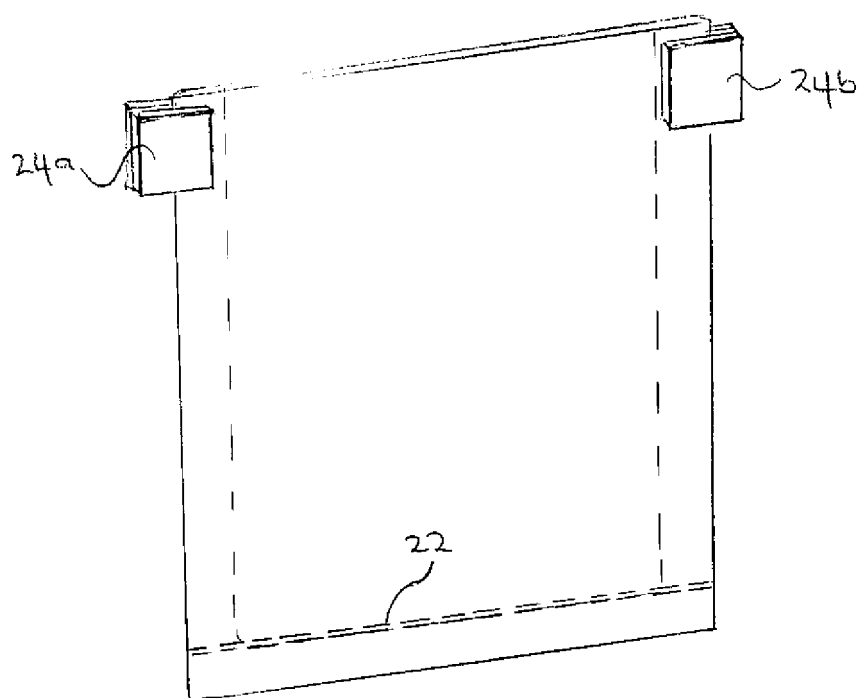


FIG. 3

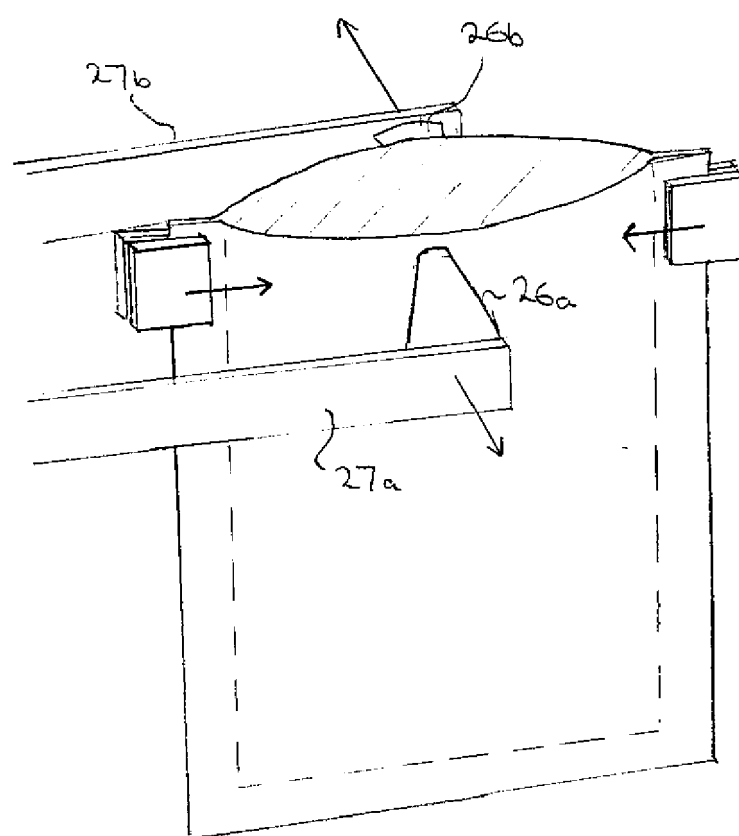


FIG. 4

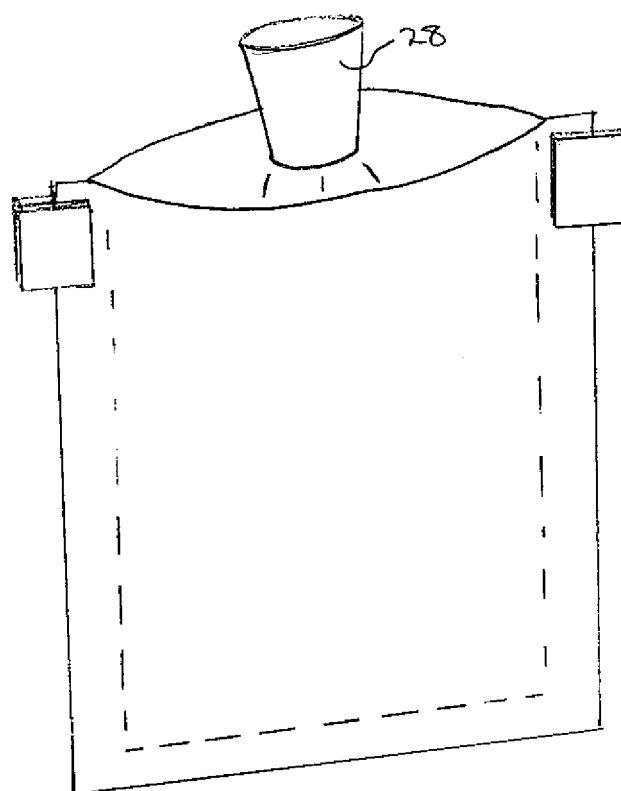
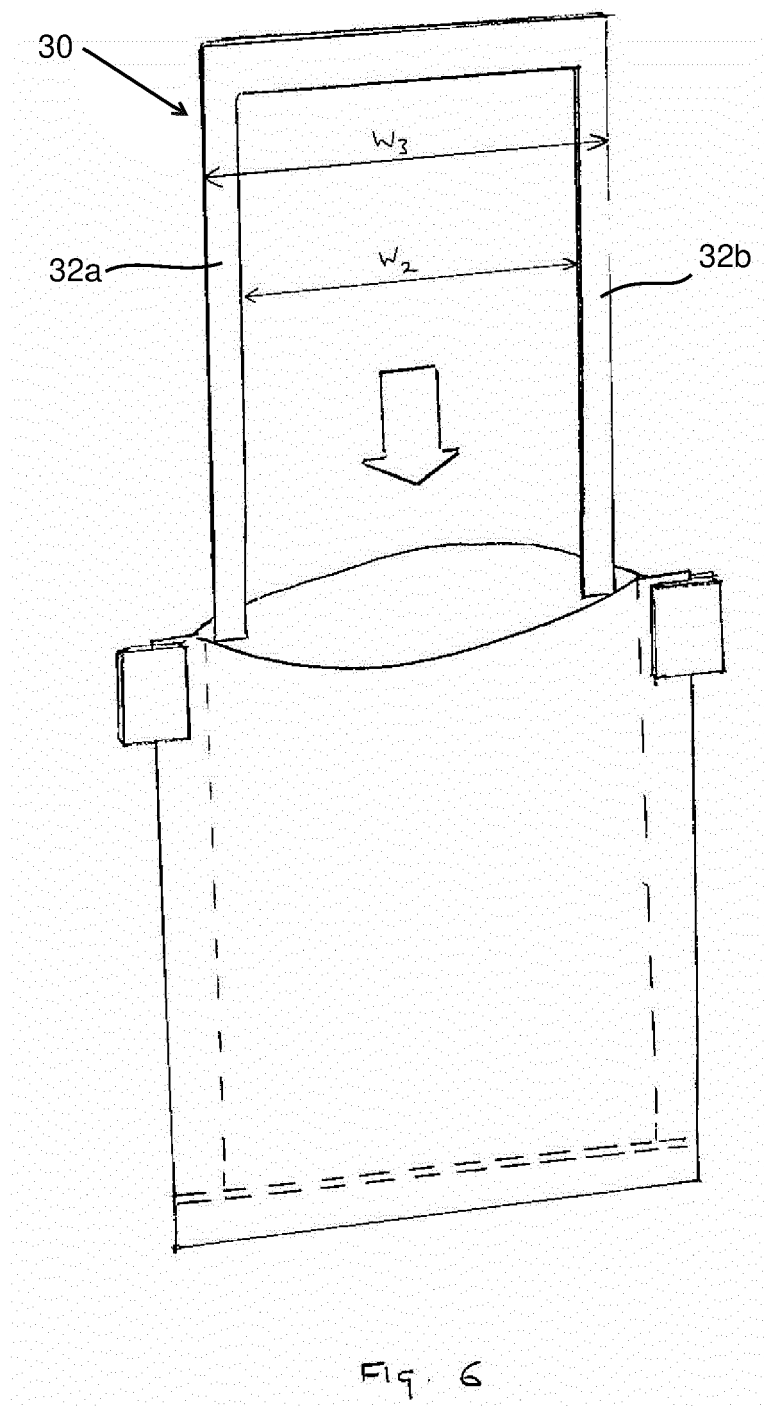
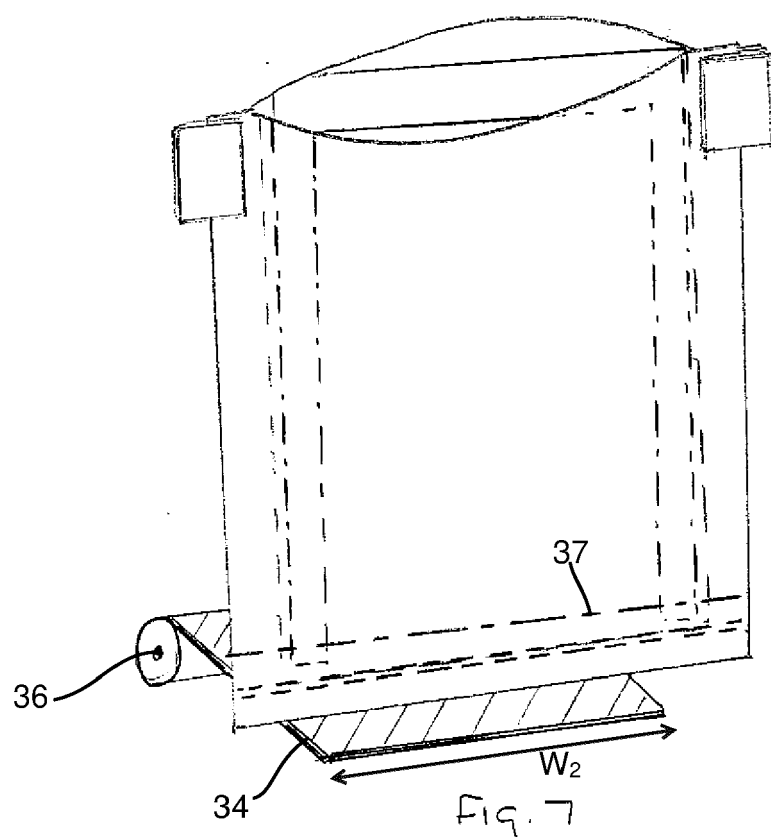


Fig. 5





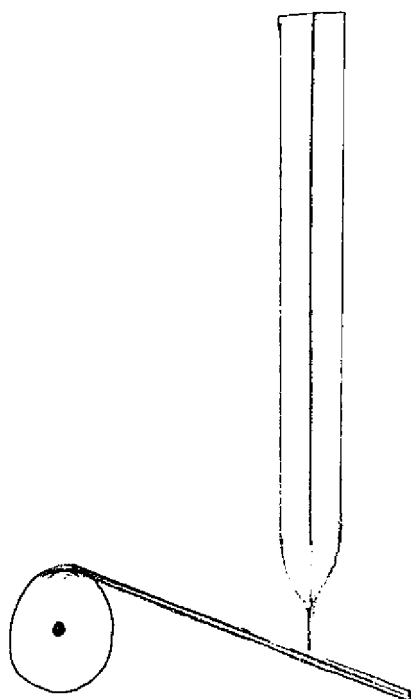


Fig. 8

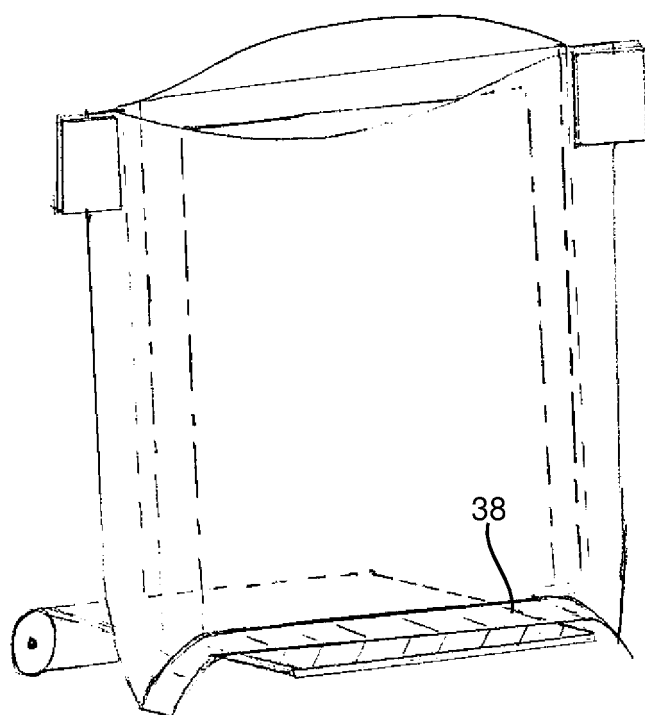


FIG. 9

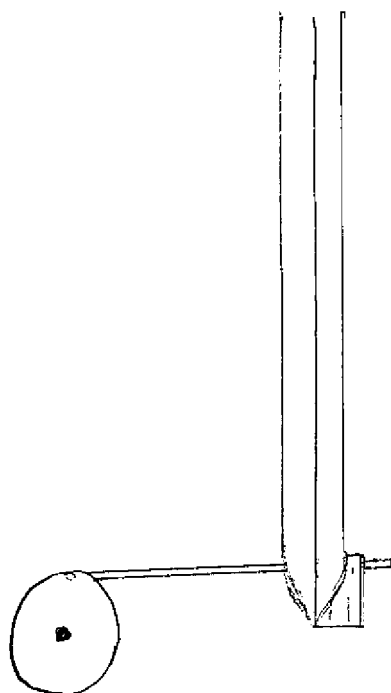


FIG. 10

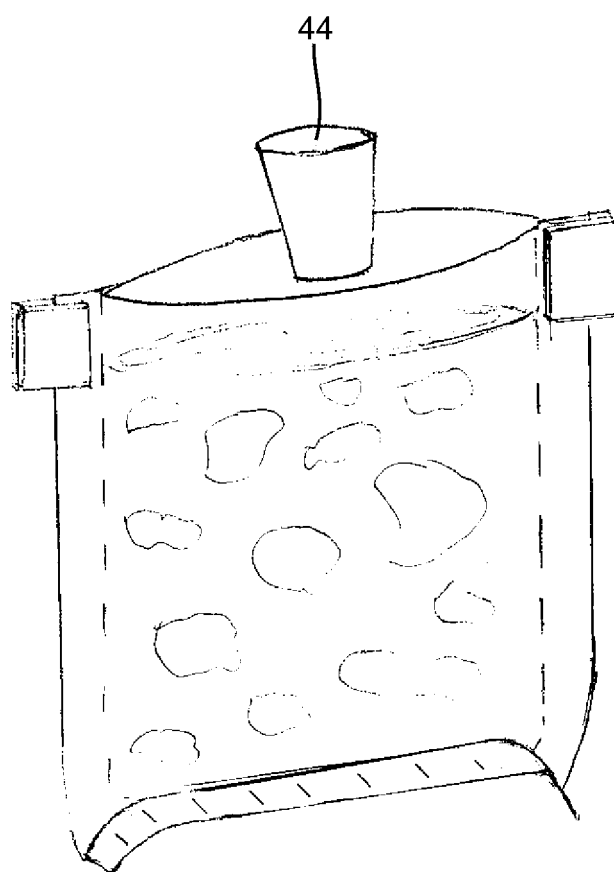


FIG. 11

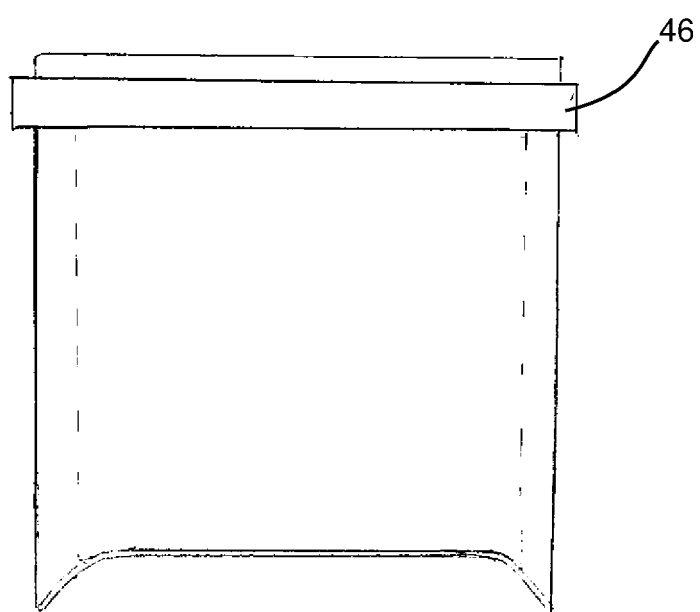


FIG. 12

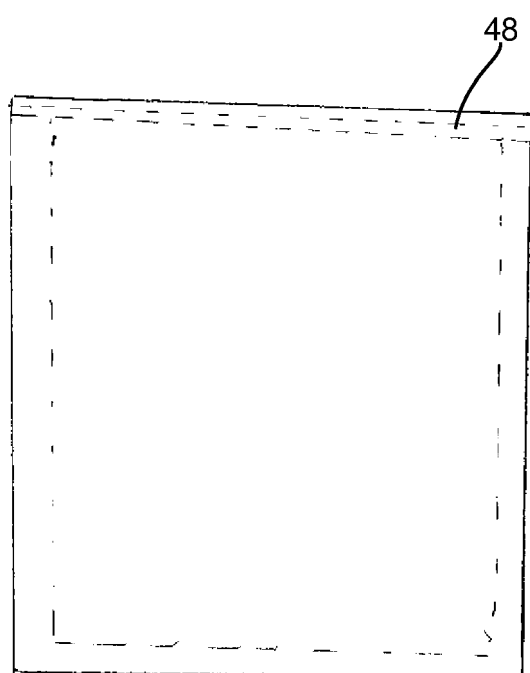


FIG. 13

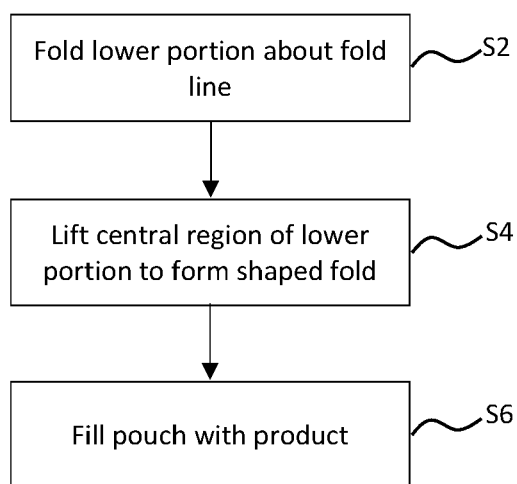


FIG. 14



EUROPEAN SEARCH REPORT

Application Number

EP 23 18 0169

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2009/232424 A1 (BIERSCHENK PATRICK JOSEPH [US] ET AL) 17 September 2009 (2009-09-17)	1, 3-8, 10-15	INV. B65B3/02 B65B43/30
Y	* paragraph [0039] - paragraph [0043]; figures 3-5 *	2, 9	B65B43/54 B65B61/24 B65D27/00
Y	DE 34 41 947 A1 (BOSCH GMBH ROBERT [DE]) 28 May 1986 (1986-05-28) * page 5 - page 7; figures 1-4 *	2, 9	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65B B65D B31F B31B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		15 February 2024	Kelliher, Cormac
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 O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 23 18 0169

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15-02-2024

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009232424 A1	17-09-2009	AU 2009223514 A1	17-09-2009
		BR PI0909153 A2	01-12-2015
		CA 2718223 A1	17-09-2009
		CN 102015276 A	13-04-2011
		EP 2268480 A2	05-01-2011
		RU 2010141360 A	20-04-2012
		US 2009232424 A1	17-09-2009
		US 2016159543 A1	09-06-2016
		US 2019218009 A1	18-07-2019
		WO 2009114386 A2	17-09-2009
		ZA 201006631 B	25-05-2011
DE 3441947 A1	28-05-1986	DE 3441947 A1	28-05-1986
		JP S61127422 A	14-06-1986

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82