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(71) Applicant:
THE PROCTER & GAMBLE COMPANY
Cincinnati, Ohio 45202 (US)

(72) Inventors:
• **Bitowft, Bruce Kevin**
61479 Glashütten (DE)

• **Erbe, Helmut Norbert**
67549 Worms (DE)
• **Becker, Michael**
63785 Obernburg am Main (DE)
• **Tischler, Heiko Armin Ernst Friedrich**
97074 Würzburg (DE)

(74) Representative:
Canonici, Jean-Jacques et al
Procter & Gamble European Service GmbH,
Sulzbacher Strasse 40-50
65824 Schwalbach am Taunus (DE)

(54) Process for packing absorbent articles and creating simultaneously a handle-element

(57) A process for packing flexible articles in a flexible bag (10) wherein said flexible bag (10) is sealed at its top panel (11) after introduction of said flexible articles leaving attached at least one flap (12) protruding from said top panel (11) of said flexible bag (10), said flap (12) comprises a grip area (14) and a grip area perimeter (15), characterised in that said flexible bag (10) is pre-made before said introduction of said flexible articles through an area corresponding to said top panel (11), a handle element (13) is shaped from said flap (12), said handle element (13) comprising a handle element perimeter (16).

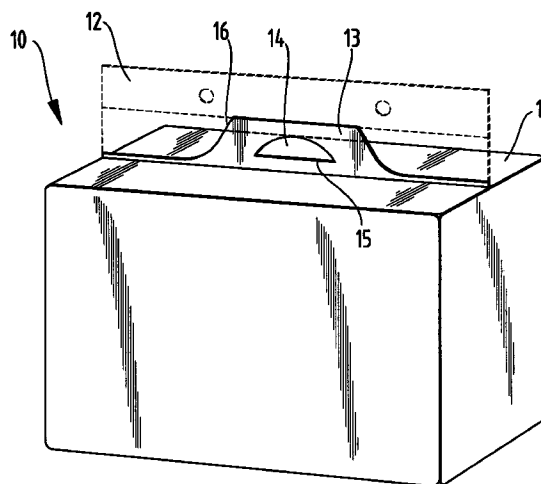


Fig. 1

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Description

Field of the invention

The invention relates to a process for packing absorbent articles in a pre-made flexible bag and subsequently creating a handle element on-line.

Description of the prior art

Flexible bags are widely used to pack many different types of consumer products. For instance, disposable diapers are typically packed in plastic bags. The resultant bags are generally cumbersome and difficult to carry. In order to facilitate consumer handling, handle elements are disposed on the outer surface of the flexible bags. It has been customary to provide separate handle elements of cardboard, moulded plastic or other suitable materials that are glued, stapled or heat welded to the bag. US 4,252,269 teaches a bag of polymeric plastic material that has an opening at one end and a gusset at the opposite end. Within the gusset, a handle is welded to the front and rear panels of the bag along a fold line. In US 4,539,705, the handle strip is inserted in the gusset during production of the bag and the ends of the handle strip are sealed to the adjacent wall panels of the bag by a heat seal. US 5,054,619 refers to an easy open flexible bag containing one or more stacks of flexible articles that comprises a longitudinally oriented carrying handle, which is formed independently of the bag. These handle elements are not entirely satisfactory for all purposes and are often impractical in terms of material utilisation, wastage of raw materials, complexity of process steps, stacking and packaging, and effectiveness in that the handle element can tear away from the carrier bag and expose the contents.

Nevertheless, some bags have been specifically designed with integral handle elements. US 5,026,173 describes a plastic bag having a side panel with a carry grip area in which a carry strip portion is located. The carry strip portion is formed between carry grip apertures or easily breakable weakening lines. The carry strip is coplanar with the side panel of the plastic bag and does not require seals of any kind. Protective and reinforcement strips are provided underneath the carry grip apertures in order to protect the contents of the plastic bag from external contamination. GB 1 575 921 teaches a bag provided with a carrier handle means where the handle is not located in loose flap members protruding from a sealed top panel, but in a flap participating in the wrapping of the articles. The products are first packaged in the bag, the flap portion is then folded over the top side of the products and thereafter the other flap portion is folded down along the vertical side of the bag and adhesively attached to this side. US 4,913,693 provides a bag that includes a side-to-side continuous handle, which is formed from pieces of material that make up the sidewalls of the bag and a

closed top formed from a separate piece of material. DE 2 051 833 describes a means of producing a package for hygienic articles comprising two strips of plastic, one wider than the other. The preferred production method consists of first forming a tube around the articles to be packed, then welding transversely to separate the tubes or packages while at the same time cutting the packages successively from one another. The resultant package may contain a handle and a tear-off opening. The handle lies between the welding seam used to seal the package shut and an additional seam, which is present for stability purposes.

The above prior art, however, does not teach a process for packing absorbent articles in a pre-made flexible bag by introducing the absorbent articles through an area corresponding to the top panel of the bag and by subsequently creating a handle element on-line from the excess trim material protruding from the top panel. Excess trim material is usually included in a bag design to account for variations in the height of the products to be packed and to allow for sealing variations. The exploitation of this excess trim material according to the present invention leads to such benefits as excellent material utilisation and a reduction in raw material wastage. The advantage of the pre-made bag lies in the flexibility that it offers to both suppliers, packagers and manufacturers. There is no tying effect and therefore no need exists for the combination of an on-line packaging and bag manufacturing step as described in the prior art document DE 2 051 833. The complexity of the manufacturing phase is thus greatly reduced. Furthermore, with the aid of suitable reinforcements and effective sealing techniques, a strong handle element mounting can be formed which results in improved consumer confidence.

Object and summary of the invention

It is an object of the present invention to provide a process for packing absorbent articles in a pre-made flexible bag by introducing the absorbent articles through an area corresponding to the top panel of the bag and by subsequently creating a handle element on-line from the excess trim material protruding from the top panel. A further object of the present invention is to provide a strong handle element mounting using suitable reinforcements and effective sealing techniques.

In accordance with the objects of the invention, a pre-made flexible bag for flexible articles is provided. Flexible articles are introduced into the flexible bag through an area corresponding to the top panel, which is subsequently sealed at its top panel. At least one flap protruding from the top panel is left attached. The flap comprises a grip area and a grip area perimeter. The flexible bag is pre-made before the introduction of the flexible articles and a handle element is shaped from the flap protruding from the top panel, the handle element comprising a handle element perimeter. The pre-

ferred embodiment comprises two flaps. The handle element comprises a seal running along the handle element perimeter. In order to allow fingers or hands to wrap around the handle, a grip area is formed. The reinforced handle element can comprise flaps that are sealed together in the entire area of the handle element except for the grip area or the flaps are further reinforced at the handle element perimeter or the flaps comprise a seal surrounding the grip area perimeter or the flaps comprise a seal abutting the entire grip area perimeter.

Brief description of the drawings

While the specification concludes with claims particularly pointing out and distinctly claiming the invention, it is believed that the invention will be better understood from the foregoing description in conjunction with the accompanying drawings in which:

Figure 1 is a front view of a pre-made flexible bag comprising a handle element made on-line.

Figure 2 is a front view of the various design configurations existing for the handle element of the pre-made flexible bag.

Figure 3 shows six different embodiments of sealing design configurations that are suitable for the handle element of the pre-made flexible bag.

Detailed description of the invention

As used herein, the term "pre-made" refers to a bag in which the front, back, top, bottom and side panels are all interconnected. As used herein, the term "grip area" describes the area designed for gripping that is either cut, punched or scored out. As used herein, the term "grip area perimeter" represents the edge of the grip area. As used herein, the term "handle element perimeter" represents the edge of the handle element.

Figure 1 shows a pre-made flexible bag 10 comprising flexible articles. The flexible articles may comprise disposable absorbent diapers, sanitary articles, incontinence pads or briefs, bandages and the like. The flexible articles are typically compressed to between 20 and 70 percent of their uncompressed volume and may be oriented either with all their waist features directed upwards towards the top panel 11 of the flexible bag 10 or with all their waist features directed downwards towards the bottom panel of the flexible bag 10 or the flexible articles may be alternated. The flexible bag 10 is preferably made from conventional flexible polymer such as polyethylene or oriented polypropylene and the film caliper ranges from 30 to 120 micrometres. The flexible bag 10 comprises a top panel 11, a bottom panel, a front panel, a back panel and a pair of side panels, which are all interconnected according to means

known in the art.

Typically, the pre-made flexible bag 10 to be used for containing the flexible articles is supplied either on wickets or on rolls, wickets being preferred. The flexible bag 10 is sealed at its top panel 11 after introduction of the flexible articles, leaving attached at least one flap 12, which protrudes from the top panel 11 of the flexible bag 10. The preferred embodiment comprises two flaps 12. These flaps 12 represent excess trim material. A handle element 13 is then shaped from the flaps 12, and comprises a handle element perimeter 16. The handle element 13 can combine both curved and straight portions as is depicted in Figure 2. Furthermore, the base of the handle element 13 can lie along a portion of the top panel 11 as is visible in embodiments (1), (2) and (4) of Figure 2 or the base of the handle element 13 can run along the entire length of the top panel 11 as is visible in embodiment (3) of Figure 2. The formation of the handle element 13 is preferentially carried out during or shortly after the top panel 11 has been sealed. The key features of the handle element 13 are the grip area 14, the grip area perimeter 15 and the handle element perimeter 16. The grip area 14 can be formed on-line by either cutting, punching or scoring out the desired shape, which is suitable for gripping by the end user, namely the consumer. Alternatively, grip holes can be cut, punched or scored out of the flaps 12. Several grip holes, preferably three or four, may be present and they can also be pre-made at the bag suppliers. The grip area perimeter 15 and the handle element perimeter 16 follow the contours of the selected shapes for the grip area 14 and the handle element 13, respectively.

Various sealing embodiments exist in order to reinforce the handle element 13 and support the weight of the flexible bag 10. With a film caliper ranging from 50 to 70 micrometres, the handle element 13 is capable of sustaining bag loads ranging from 2.5 to 4 kilograms without causing deformation or failure when being carried by the end user, namely the consumer. It is preferred that the base of the handle element 13 run along the entire length of the top panel 11 (for example, refer to embodiment (3) in Figure 2) such that the handle element 13 can better support the bag load and lead to improved stability.

Figure 3 shows six different embodiments of sealing design configurations that are suitable for the handle element 13. For each of the embodiments described below, the base of the handle element 13 comprises a seal 17, which is either the complete seal 17 or a portion of the seal 17 arising from the closure of the top panel 11 of the flexible bag 10. In the first embodiment, a seal 17 runs along the handle element perimeter 16. In the second embodiment, the flaps 12 are sealed together in the entire area of the handle element 13 except for the grip area 14. In the third embodiment, the flaps 12 are further reinforced at the handle element perimeter 16. In fact, the third embodiment comprises the first embodiment and further comprises seals 17 that are located in

the corners lying closest to the seal 17 of the base of the handle element 13 and the seal 17 running along the side of the handle element perimeter 16. It is feasible to place approximately one to three seals 17 per corner, the form of the seals 17 being either straight or curved. The fourth embodiment comprises the first embodiment plus a seal 17 surrounding the grip area perimeter 15. The seal 17 is preferably located a distance ranging from 5 to 25 millimetres from the grip area perimeter 15 and typically the seal 17 follows the contours of the shape selected for the grip area 14. The fifth embodiment similarly comprises the first embodiment plus a seal 17 abutting the entire grip area perimeter 15. The sixth embodiment, similar to the third embodiment, further comprises reinforcements at the handle element perimeter 16. More specifically, the sixth embodiment comprises both the first and fifth embodiments plus diagonal seals 17 that extend from a location on the seal 17 running along the outermost part of the handle element perimeter 16 to a location on the seal 17 of the base of the handle element 13. The seals 17 in all cases preferably range from three to four millimetres in width although any width is possible.

The sealing can be performed using conventional heat sealing techniques or alternatively, techniques such as ultrasound, crimping or pressure bonding can be employed. Heat sealing techniques tend to weaken the flaps 12 in the immediate vicinity of the sealed area due to the concentration of heat along the seal 17. In contrast, the other techniques rely less on heat and more on pressure and thus do not weaken adversely the flaps 12. It is also possible to vary the sealing pattern. Rather than having a single line comprising the sealing pattern, which is typical of the current heat sealing techniques, a pattern with alternating bonded zones and unbonded zones can be formed. The sealing pattern can comprise crosses, dashed lines, v-shapes, u-shapes, inverted shapes, to cite but a few of the many possibilities existing. The effect of the pattern results in an improved distribution of heat over a wider area and consequently, a stronger supporting film around the seals 17.

GLOSSARY

10	Flexible bag	45
11	Top panel	
12	Flap	
13	Handle element	
14	Grip area	50
15	Grip area perimeter	
16	Handle element perimeter	
17	Seal	

Claims

1. A process for packing flexible articles in a flexible bag (10) wherein said flexible bag (10) is sealed at

its top panel (11) after introduction of said flexible articles leaving attached at least one flap (12) protruding from said top panel (11) of said flexible bag (10), said flap (12) comprises a grip area (14) and a grip area perimeter (15), characterised in that said flexible bag (10) is pre-made before said introduction of said flexible articles through an area corresponding to said top panel (11), a handle element (13) is shaped from said flap (12), said handle element (13) comprising a handle element perimeter (16).

2. A process according to claim 1 wherein said flexible bag (10) comprises two of said flaps (12).
3. A process according to any of the preceding claims wherein said handle element (13) comprises a seal (17) running along said handle element perimeter (16).
4. A process according to any of the preceding claims wherein said flaps (12) are further sealed together in the entire area of said handle element (13), except for said grip area (14).
5. A process according to claims 1, 2 and 3 wherein said flaps (12) are further reinforced at said handle element perimeter (16).
6. A process according to claims 1, 2 and 3 wherein said flaps (12) comprise a seal (17) surrounding said grip area perimeter (15).
7. A process according to claims 1, 2 and 3 wherein said flaps (12) comprise a seal (17) abutting entire said grip area perimeter (15).

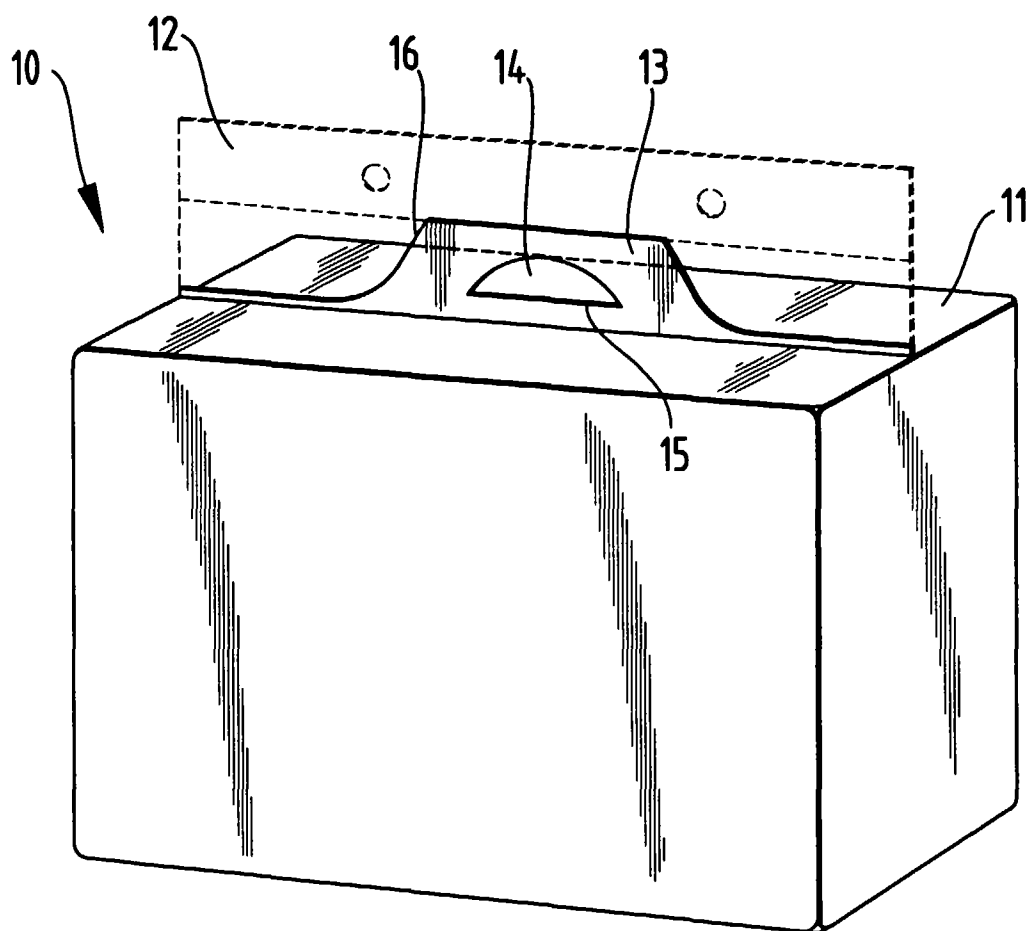
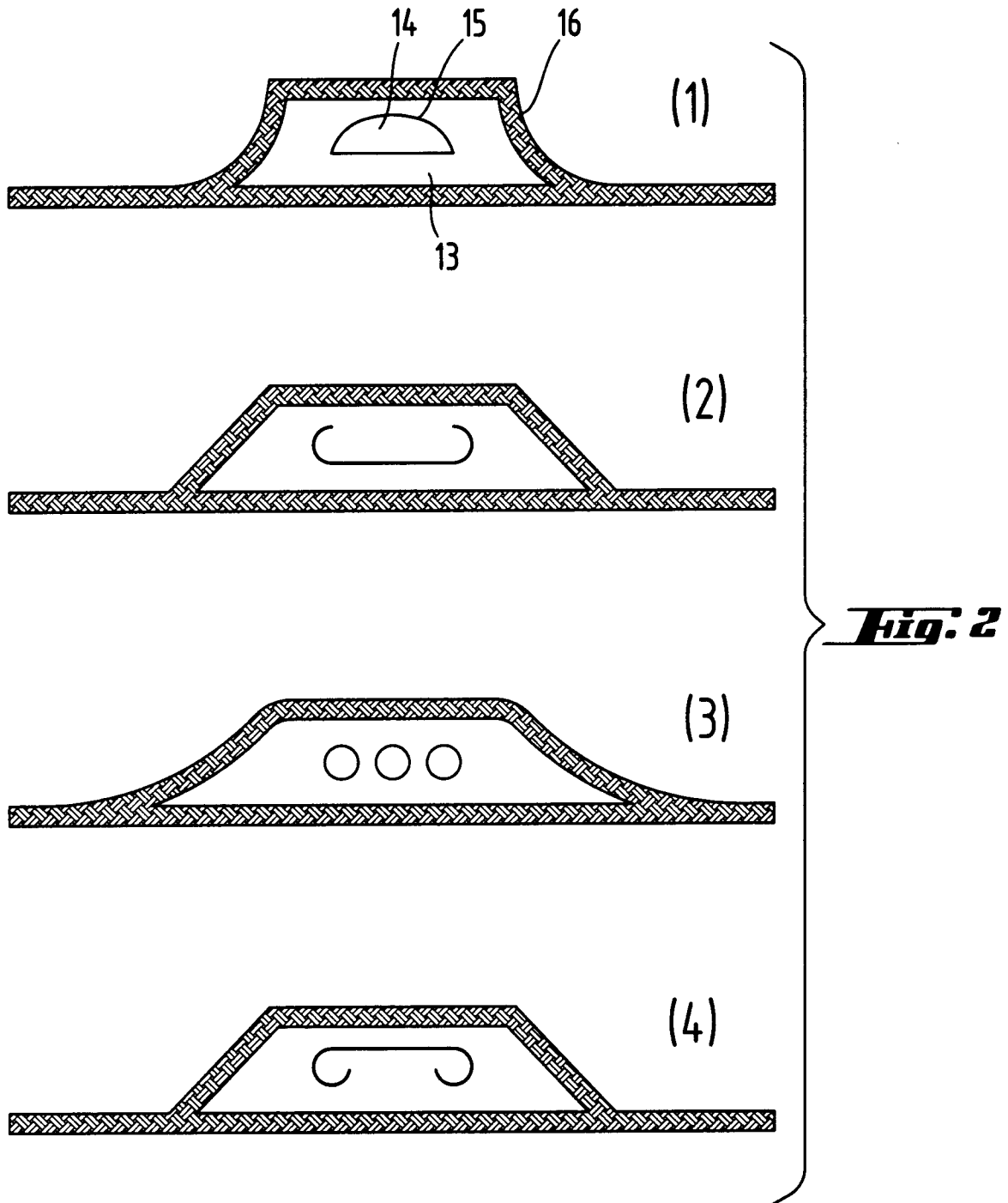
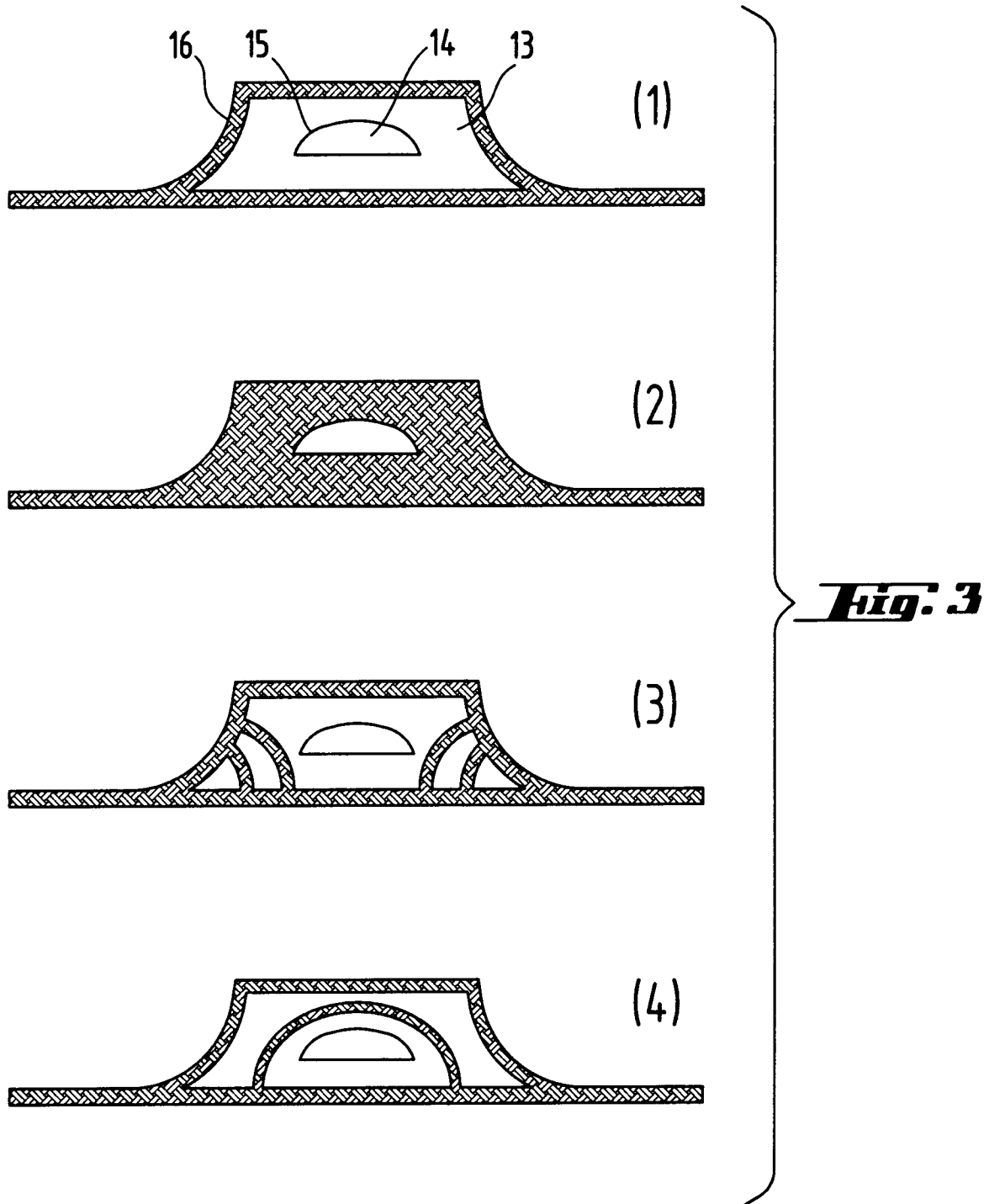
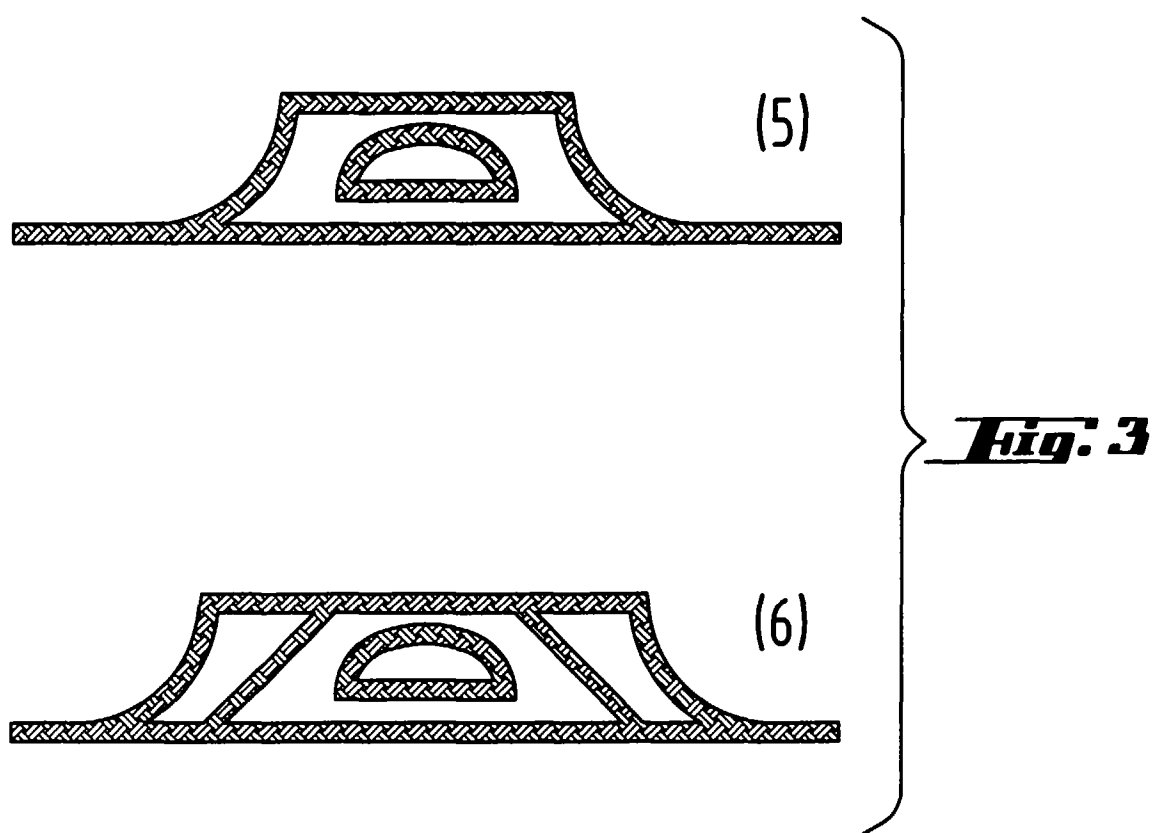


Fig. 1









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EUROPEAN SEARCH REPORT

Application Number
EP 96 11 2263

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.6)
Y	FR-A-2 648 784 (CIARROCCA) * page 5, line 4 - page 6, line 36; figures 5-7 *	1-3,6	B65B61/14
Y	US-A-3 732 661 (GOLDBERGER) * column 3, line 3 - line 34; figures 1,2 *	1-3,6	
Y	DE-U-94 11 588 (HENSEN) * the whole document *	6	
A	DE-A-23 57 667 (ICOPAC) * the whole document *	1,2	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6) B65B B65D
Place of search THE HAGUE		Date of completion of the search 3 January 1997	Examiner Claeys, H
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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