(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 712 468 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.10.2006 Bulletin 2006/42

(21) Application number: **05466020.4**

(22) Date of filing: **01.12.2005**

(51) Int Cl.:
B65B 9/06 *(2006.01)* ***B65B 9/12*** *(2006.01)*
B65B 9/20 *(2006.01)*

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **13.04.2005 CZ 20050232**
31.10.2005 CZ 20050681

(71) Applicant: **Velteko, s.r.o.**
258 77 Vlasim (CZ)

(72) Inventors:
- **Zajic, Miloslav**
  258 01 Vlasim (CZ)
- **Smid, Frantisek**
  257 64 Zdislavice (CZ)

(74) Representative: **Langrova, Irena**
Skretova 48
301 00 Plzen (CZ)

(54) Method and apparatus for forming tube-like bags

(57) On the band-shaped package material (1) a first stiffening lengthwise welded edge (5) is formed in a formation station (2). Then the package material (1) is formed on a profiling collar (3) into a lengthwise unclosed tube (6). A second longitudinal fold is formed by a spacing member (7), in first longitudinal welding jaws (9) a second stiffening lengthwise welded edge (8) is welded and formed. At the same time, the tube (6) is welded in the longitudinal direction in second longitudinal welding jaws (11) whereby a third stiffening lengthwise welded edge (12) is formed. As to the bags (19) provided with a closure a feeder (17) inserts between the inner surfaces of the package material (1) the closure (16) before welding the third stiffening lengthwise welded edge (12). Upon welding the third stiffening lengthwise welded edge (12) the closure (16) is tightly joined to the package material (1). The tube (6) is closed by transversal welding jaws (13) which form the first transversal weld (14). The goods to be packed are dosed into the transversally and lengthwise closed tube (6) by means of a filling tube (4). Upon transversal closing the tube (6) the bag (15) formed and filled up in the previous working cycle is simultaneously closed and separated from the tube (6).

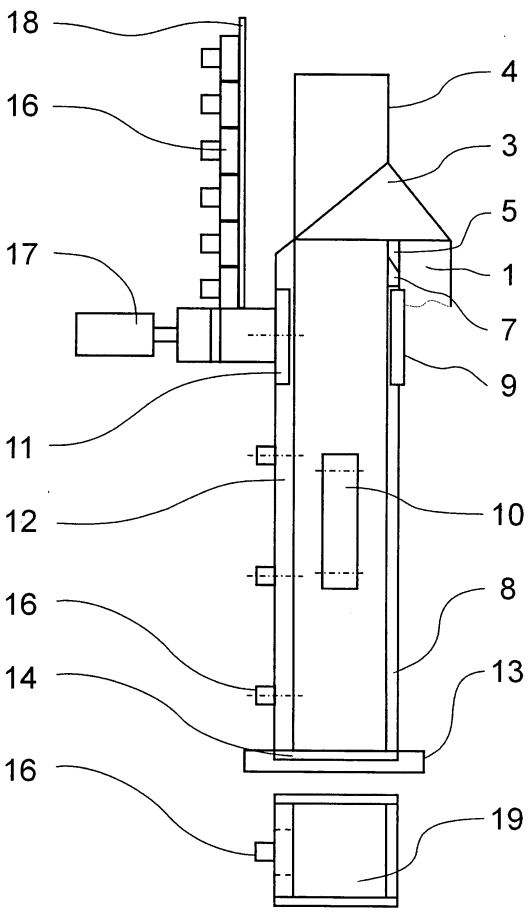

Fig. 7

EP 1 712 468 A2

Description

Field of the invention

[0001] The invention relates to a method of forming tube-like bags made of a single roll of a band-shaped package material in particular to the bags having stiffened welded edges including bags provided by closures and to a device for carrying out this method.

Description of prior art

[0002] Various methods and devices for forming tube-like bags stiffened by welded edges formed by rolling a band-shaped package material to form a tube, which is then welded in the longitudinal and transverse direction are known. In the transverse welding the bag filled with goods to be packed is closed and simultaneously a new weld is formed on a subsequent bag before its filling. Before closing the bag package material may be provided with two or more longitudinal folds that may not only close the tube in its longitudinal direction but also properly stiffen the bag. Dependent on the arrangement of the device structure the welded edges stiffen either the bottom or the envelope of the bags. The published patent application EP 1 142 786 A2 describes a device for forming a bag comprising three longitudinal folds on the tube of the package material. The object thereof is in particular the configuration of longitudinal jaws where two jaws are disposed on one side of a filling pipe and form welded edges stiffening the bottom of the bag while one jaw is located on the other side of the filling pipe and forms a weld on the upper bag wall. The published patent application DE 101 59 053 A1 discloses a method of making bags having lengthwise welded edges. Its object is particularly a structure where all welded edges of a package material are made before the rolling of this material into a tube.

[0003] Certain disadvantage of the known solutions is that when forming bags of small sizes it is difficult to properly locate all necessary longitudinal welding jaws in a limited space around a relatively small filling pipe. When using a package material that may be welded on both sides there is a danger that the individual welded edges will be attached to the package material. In the event of such an attachment, the transverse weld would be also damaged and the appearance of the bags would be worsened.

Summary of the invention

[0004] Said disadvantages are to a substantial extent eliminated by using a method of forming tube-like bags provided with stiffening lengthwise welded edges formed from a single role of a band-shaped package material. The object of the invention is that primarily a first stiffening lengthwise welded edge is formed on the band-shaped package material. Thereafter, the package material including the first stiffening lengthwise welded edge is rolled into an unclosed tube on which a second stiffening lengthwise welded edge and a third stiffening lengthwise welded edge is formed. The third stiffening lengthwise welded edge may be situated in the bottom or on the top of the bag. In the process of forming the tube-like bags having stiffening lengthwise welded edges and provided with a closure then, before the welding of the third stiffening lengthwise welded edge, firstly the closure is inserted between the inner surfaces of the band-shaped package material, whereupon the third stiffening lengthwise welded edge is formed. In this way the closure is tightly joined to the inner surfaces of the band-shaped package material and a bag provided with the stiffening welded lengthwise welded edges and the closure is formed.

[0005] A device for performing said method comprises a station for forming and welding the first stiffening lengthwise welded edge, a profiling collar for profiling the tube, a filling pipe including a spacing member for forming the second stiffening lengthwise welded edge, first longitudinal welding jaws for welding the second stiffening lengthwise welded edge, second longitudinal welding jaws for welding the third stiffening lengthwise welded edge, a tube feeding equipment and transversal welding jaws provided with a separating knife. The station for forming and welding the first stiffening lengthwise welded edge is located ahead of the profiling collar. The spacing member, the first longitudinal welding jaws for welding the second stiffening lengthwise welded edge and the second longitudinal welding jaws for welding the third stiffening lengthwise welded edge are located behind the profiling collar. The device for forming and welding the tube-like bags having the stiffening lengthwise welded edges provided with a closure comprises a feeder including a supply line for the supply of closures. The station for forming and welding the first stiffening lengthwise welded edge, the first longitudinal welding jaws, the second longitudinal welding jaws, the feeder, the tube feeding equipment, and the transversal welding jaws including the separating knife are adapted for both the discontinuous and continuous passage of the package material through the device.

[0006] One advantage of the method and device according to this invention is that in the area surrounding the filling pipe not all longitudinal welding jaws are situated what enables to produce even very small bags of a package material capable to be welded on one side only or on both sides using both the discontinuous or continuous movement of the package material. Another advantage is the possibility to use a suitable closure inserted into the third stiffening lengthwise welded edge. The closure may be located either on the top or in the bottom part of the bag. The bag provided with a closure is suitable specifically for packing liquids.

Brief description of the drawings

[0007] The invention is further explained in more de-

tails by means of the accompanying drawings in which:

Fig. 1 - shows schematically a structure of a device through which the method of manufacture of tube-like bags with a third stiffening lengthwise welded edge located in the bottom of the bag is carried out;
Fig. 2 - is a sectional view of a filling pipe along a plane A-A;
Fig. 3 - shows a bag having stiffening lengthwise welded edges whereby the third lengthwise welded edge is located in the bottom of the bag;
Fig. 4 - shows a schematic structure of the device through which the method of manufacture of tube-like bags with a third stiffening lengthwise welded edge located on the top of the bag is carried out;
Fig. 5 - is a sectional view of a filling pipe along a plane B-B;
Fig. 6 - shows a bag having stiffening lengthwise welded edges whereby the third lengthwise welded edge is located on the top of the bag;
Fig. 7 - shows a schematic structure of a device through which the method of manufacture of tube-like bags with a third stiffening lengthwise welded edge and a closure located on the top of the bag is carried out; and
Fig. 8 - shows a bag comprising stiffening welded edges and a closure.

Detailed description of embodiments of the invention

[0008] In forming tube-like bags formed from a single role of a band-shaped package material 1 more specifically bags 15 stiffened by three stiffening lengthwise welded edges 5, 8 and 12 (Fig. 3), primarily a first longitudinal fold is formed on a band-shaped package material 1 (Fig. 1), which fold is welded and a first stiffening lengthwise welded edge 5 is formed. The package material 1 including the first stiffening lengthwise welded edge 5 is formed into a tube 6 which remains unclosed in its longitudinal direction and is rolled around a filling pipe 4. A second longitudinal fold is then formed on the filling pipe 4 and this fold is subsequently welded to form a second stiffening lengthwise welded edge 8. Simultaneously, the tube 6, which is still being unclosed in its longitudinal direction is welded in the longitudinal direction and in the bottom of the bag 15 a third stiffening lengthwise welded edge 12 is formed.

[0009] In forming tube-like bags made from a single role of a band-shaped package material 1, more specifically bags 20 stiffened by three stiffening lengthwise welded edges 5, 8 and 12 (Fig. 6), primarily the first longitudinal fold is formed on the band-shaped package material 1 (Fig. 4), which fold is welded and the first stiffening lengthwise welded edge 5 is formed. The package material 1 including the first stiffening lengthwise welded edge 5 is formed into the tube 6 which is still unclosed in its longitudinal direction and is rolled around the filling pipe 4. The second longitudinal fold is then formed on the filling pipe 4 and this fold is subsequently welded to form the second stiffening lengthwise welded edge 8. Simultaneously, the tube 6, still being unclosed in its longitudinal direction is welded lengthwise and the third stiffening lengthwise welded edge 12 is formed on the top of the bag 20.

[0010] In forming tube-like bags 19 stiffened by three stiffening lengthwise welded edges 5, 8 and 12 and provided with a closure 16 (Fig. 8) primarily the first longitudinal fold is formed on the band-shaped package material 1 (Fig. 7), which fold is welded and the first stiffening lengthwise welded edge 5 is formed. The package material 1 including the first stiffening lengthwise welded edge 5 is formed into the tube 6 which is still unclosed in its longitudinal direction and is rolled around the filling pipe 4. The second longitudinal fold is then formed on the filling pipe 4 and this fold is subsequently welded to form the second stiffening lengthwise welded edge 8. Before welding the third stiffening lengthwise welded edge 12 the closure 16 is inserted between the inner surfaces of the band-shaped package material 1. Subsequently, upon welding the second stiffening lengthwise welded edge 12 the closure 16 is tightly joined to the inner surfaces of the band-shaped package material 1.

[0011] A device for forming bags 15 stiffened by three stiffening lengthwise welded edges 5, 8 and 12 comprises a formation station 2 (Fig. 1) for forming and welding the first stiffening lengthwise welded edge 5 on the band-shaped package material 1. After the formation station 2 a profiling collar 3 is situated to form the band-shaped package material 1 into an unclosed tube 6 comprising the first stiffening longitudinal edge 5. A profiling collar 3 is connected with the filling pipe 4 which is disposed below the profiling collar 3. To the filling pipe 4, in the area below the profiling collar 3, a forming spacing member 7 for forming the second stiffening longitudinal welded edge 8 is fixed. Below the spacing member 7 first longitudinal welding jaws 9 for welding the second stiffening lengthwise welded edge 8 are situated. On the opposite side of the filling pipe 4 second longitudinal welding jaws 11 (Fig. 2) are disposed to weld a third stiffening welded edge 12. Below the longitudinal welding jaws 9 and 11 for welding the second and the third stiffening longitudinal welded edges 8 and 12 opposite one or more walls of the filling pipe 4 a feeding equipment 10 for moving the tube 6 is situated. Below the filling pipe 4 transversal welding jaws 13 for making a transverse weld 14 are situated. The transversal welding jaws 13 include a separating knife for the separation of the filled up bag 15 from the remaining part of the tube 6.

[0012] A device for forming bags 20 stiffened by three stiffening lengthwise welded edges 5, 8 and 12 comprises a formation station 2 (Fig. 4) for forming and welding the first stiffening lengthwise welded edge 5 on the band-shaped package material 1. After the formation station 2 a profiling collar 3 is situated to form the band-shaped package material 1 into an unclosed tube 6 comprising the first stiffening longitudinal edge 5. The profiling collar

3 is connected with a filling pipe 4, which is disposed below the profiling collar 3. To the filling pipe 4, in the area below the profiling collar 3, a forming spacing member 7 for forming the second stiffening longitudinal welded edge 8 is fixed. Below the spacing member 7 first longitudinal welding jaws 9 for welding the second stiffening lengthwise welded edge 8 are situated. On the opposite side of the filling pipe 4 second longitudinal welding jaws 11 (Fig. 5) are disposed to weld the third stiffening welded edge 12. Below the longitudinal welding jaws 9 and 11 for welding the second and the third stiffening longitudinal welded edges 8 and 12 opposite one or more walls of the filling pipe 4 a feeding equipment 10 for moving the tube 6 is situated. Below the filling pipe 4 transversal welding jaws 13 for making a transverse weld 14 are situated. The transversal welding jaws 13 include a separating knife for the separation of the filled up bag 20 from the remaining part of the tube 6.

[0013] A device (Fig 7) for forming bags 19 (Fig. 8) stiffened by three stiffening lengthwise welded edges 5, 8 and 12 and provided with a closure 16 includes in addition a feeder 17 comprising a supply line 18 for supplying the closures 16. The feeder 17 is located in the area of the second longitudinal welding jaw 11 for welding the third stiffening lengthwise welded edge 12.

[0014] The function of the device (Fig. 1) for forming the tube-like bags 15 stiffened by three stiffening lengthwise welded edges 5, 8 and 12 where the first and the third stiffening lengthwise welded edges 5 and 12 are situated in the bottom and the second lengthwise welded edge is situated on the upper part of the bag 15 (Fig. 3) is as follows. The band-shaped package material 1 is unrolled from a single roll and continues to the formation station 2. In the formation station 2 the first stiffening lengthwise welded edge 5 is formed and welded. The band-shaped package material 1 comprising the first stiffening welded edge 5 is supplied to the profiling collar 3 in which the material is formed into the tube 6 unclosed in the longitudinal direction, which tube further passes to the filling pipe 4. The second longitudinal fold is then formed on the spacing member 7, which is located at the filling pipe 4. The second longitudinal fold is welded in the first longitudinal welding jaws 9 and the second stiffening lengthwise welded edge 8 is thus formed. On the opposite side of the filling pipe 4 (Fig. 2) in the second longitudinal welding jaws 11 the still unclosed tube 6 is simultaneously closed by a longitudinal weld to form the third stiffening lengthwise welded edge 12. In this way a tube-like bag 15a stiffened by three stiffening lengthwise welded edges 5, 8 and 12 is formed. Upon welding the second and the third stiffening longitudinal edges 8 and 12 the tube 6 is simultaneously closed also in the transversal direction by the transverse welding jaws 13 by which a transverse weld 14 is formed on the tube 6. The goods to be packed are dosed from the inner space of the filling pipe 4 into the transversally and lengthwise welded tube 6 surrounding the filling pipe 4 . Upon closing the tube 6 in the transversal direction the bag formed in the previous working cycle is simultaneously closed and separated from the tube 6. On the completed bag 15 (Fig. 3) the both transverse welds 14 form also lateral reinforcements. The first stiffening lengthwise welded edge 5 and the third stiffening lengthwise welded edge 12 reinforce the bottom of the bag 15. The second stiffening lengthwise welded edge 8 reinforces the top of the bag 15. The tube 6 comprising the goods dosed is transported by means of a feeding equipment 10 in the direction of the longitudinal axis of the filling pipe 4 along a path equal to the width of the bag 15 and the whole process of forming the tube-like bags 15 having the stiffening longitudinal edges 5, 8 and 12 is repeated.

[0015] The function of the device (Fig. 4) for forming the tube-like bags 20 stiffened by three stiffening lengthwise welded edges 5, 8 and 12 where the first stiffening lengthwise welded edge 5 and the second stiffening lengthwise welded edge 8 are situated in the bottom and the third lengthwise welded edge 12 is situated on the upper part of the bag 20 (Fig. 6) is as follows. The band-shaped package material 1 is unrolled from a single roll and continues to the formation station 2. In the formation station 2 the first stiffening lengthwise welded edge 5 is formed and welded on the band-shaped package material 1. The band-shaped package material 1 comprising the first stiffening welded edge 5 is supplied to the profiling collar 3 in which the material is formed into the tube 6 still unclosed in the longitudinal direction, which tube further passes to the filling pipe 4. The second longitudinal fold is formed on the spacing member 7, which is located at the filling pipe 4. The second longitudinal fold is welded in the first longitudinal welding jaws 9 and the second stiffening lengthwise welded edge 8 is thus formed. On the opposite side of the filling pipe 4 (Fig. 5) in the second longitudinal welding jaws 11 the still unclosed tube 6 is simultaneously closed by a longitudinal weld to form the third stiffening lengthwise welded edge 12. In this way the tube-like bag 20 stiffened by three stiffening lengthwise welded edges 5, 8 and 12 is formed. Upon welding the second stiffening longitudinal edge 8 and the third stiffening longitudinal edge 12 the tube 6 is simultaneously closed also in the transversal direction by means of the transverse welding jaws 13 by which the transverse weld 14 is formed on the tube 6. The goods to be packed are dosed from the inner space of the filling pipe 4 into the transversally and lengthwise welded tube 6 surrounding the filling pipe 4. Upon closing the tube 6 in the transversal direction the bag 20 formed in the previous working cycle is simultaneously closed and separated from the tube 6. On the completed bag 20 (Fig. 6) the both transverse welds 14 form also lateral reinforcements. The first stiffening lengthwise welded edge 5 and the second stiffening lengthwise welded edge 8 reinforce the bottom of the bag 20. The third second stiffening lengthwise welded edge 12 reinforces the top of the bag 20. The tube 6 comprising the goods dosed is transported by means of the feeding equipment 10 in the direction of the longitudinal axis of the filling pipe 4 along a path equal

to the width of the bag 20 and the whole process of forming the tube-like bags 20 with the stiffening longitudinal edges 5, 8 and 12 is repeated.

[0016] The function of the device (Fig. 7) for forming the tube-like bags 19 stiffened by three stiffening lengthwise welded edges 5, 8 and 12 provided with the closure 16 where the closure 16 is placed on the upper part of the bag 19 is the same as far as the process of forming the first stiffening lengthwise welded edge 5 and the second stiffening lengthwise welded edge 8 is concerned. The structure of the profiling collar enables to place the third stiffening lengthwise welded edge 12 on the top of the bag. The closures 16 for the tube-like bags 19 provided with closures are supplied by the supply line 18 to the feeder 17 which is located in the area of the second welding jaw 11 for welding the third stiffening lengthwise welded edge 12. Before welding the third stiffening lengthwise welded edge 12 the feeder 17 inserts the closure 16 between the inner surfaces of the band-shaped package material 1. Subsequently, the closure 16 is tightly joined to the inner surfaces of the band-shaped package material 1 by means of the second longitudinal welding jaw 11 when the third stiffening lengthwise welded edge 12 is welded. Together with welding the second and the third stiffening lengthwise welded edges 8 and 12 the tube 6 is closed also in its transversal direction by means of the welding jaws 13, which form the transversal weld 14 on the tube 6. The goods to be packed are dosed from the inner space of the filling pipe 4 into the transversally and lengthwise welded tube 6 surrounding the filling pipe 4. Upon closing the tube 6 in the transversal direction the bag 19 formed and filled up in the previous working cycle is simultaneously closed and separated from the tube 6. On the completed bag 19 (Fig. 8) the both transverse welds 14 form also lateral reinforcements. The first stiffening lengthwise welded edge 5 and the second stiffening lengthwise welded edge 8 reinforce the bottom of the bag 19. The third stiffening lengthwise welded edge 12 reinforces the top of the bag 19. The tube 4 comprising the goods dosed is transported by means of the feeding equipment 10 in the direction of the longitudinal axis of the filling pipe 4 along a path equal to the width of the bag 19 and the whole process of forming the tube-like bags 19 with the stiffening longitudinal edges 5, 8 and 12 is repeated.

Industrial applicability

[0017] The invention is designed for the use in packing technologies in particular for packing goods into a tube-like bags formed of a single roll of a band-shaped package material and having stiffening lengthwise welded edges.

List of reference characters

[0018]

1 band-shaped package material
2 formation station 2 for forming and welding the first stiffening lengthwise welded edge 5
3 profiling collar 3 for forming the tube 6
4 filling pipe
5 the first stiffening lengthwise welded edge
6 tube 6 of the package material 1
7 spacing member
8 second stiffening lengthwise welded edge
9 first longitudinal welding jaws 9 for welding the second stiffening lengthwise welded edge 8
10 tube 6 feeding equipment 10
11 second longitudinal welding jaws 11 for welding the second stiffening lengthwise welded edge 12
12 third stiffening lengthwise welded edge
13 transversal welding jaws 13 provided with a separating knife
14 transverse weld
15 bag having the third stiffening welded edge located in the bottom
16 closure
17 feeder
18 supply line
19 bag comprising a closure
20 bag having the third stiffening edge located on the top

Claims

1. A method of forming tube-like bags (15),(20), having stiffening lengthwise welded edges (5), (8), (12), made from a single role of a band-shaped packing material **characterized in that** on the band-shaped package material (1) primarily a first stiffening lengthwise welded edge (5) is formed, whereupon the package material (1) including the first stiffening lengthwise welded edge (5) is rolled into an unclosed tube (6) on which a second stiffening lengthwise welded edge (8) and a third stiffening lengthwise welded edge (12) is formed.

2. A method of forming tube-like bags (20), having stiffening lengthwise welded edges (5), (8), (12), **characterized in that** before welding the third stiffening lengthwise welded edge (12) a closure (16) is inserted between the inner surfaces of the band-shaped package material (1) and then the third stiffening lengthwise welded edge (12) is formed whereby the closure (16) is tightly joined to the inner surfaces of the band-shaped package material (1) and a tube-like bag (19) comprising the stiffening lengthwise welded edges (5), (8), (12), and closure (16) is made.

3. A device for performing the method according to claim 1 comprising a station (2) for forming and welding the first stiffening lengthwise welded edge (5) a profiling collar (3) for profiling the tube (6), a filling

pipe (4) including a spacing member (7) for forming the second stiffening lengthwise welded edge (8), first longitudinal welding jaws (9) for welding the second stiffening lengthwise welded edge (8), second longitudinal welding jaws (11) for welding the third stiffening lengthwise welded edge (12), a tube feeding equipment (10) and transversal welding jaws (13) provided with a separating knife **characterized in that** the station (2) for forming and welding the first stiffening lengthwise welded edge (5) is located ahead of the profiling collar (3) while the spacing member (7), the first longitudinal welding jaws (9) for welding the second stiffening lengthwise welded edge (8) and the second longitudinal welding jaws (11) for welding the third stiffening lengthwise welded edge (12) are located behind the profiling collar (3).

4. A device for performing the method according to claim 1 **characterized in that** in the area of the second longitudinal welding jaw (11) for welding the third stiffening lengthwise welded edge (12) a feeder (17) including a supply line for supplying closures (16) is situated.

5. A device according to claim 2 **characterized in that** the station (2) for forming and welding the first stiffening lengthwise welded edge (5), the first longitudinal welding jaws (9), the second longitudinal welding jaws (11), the feeder (17), the tube feeding equipment (10 and the transversal welding jaws (13) provided with a separating knife are adapted for continuous passing the package material (1) through the device.

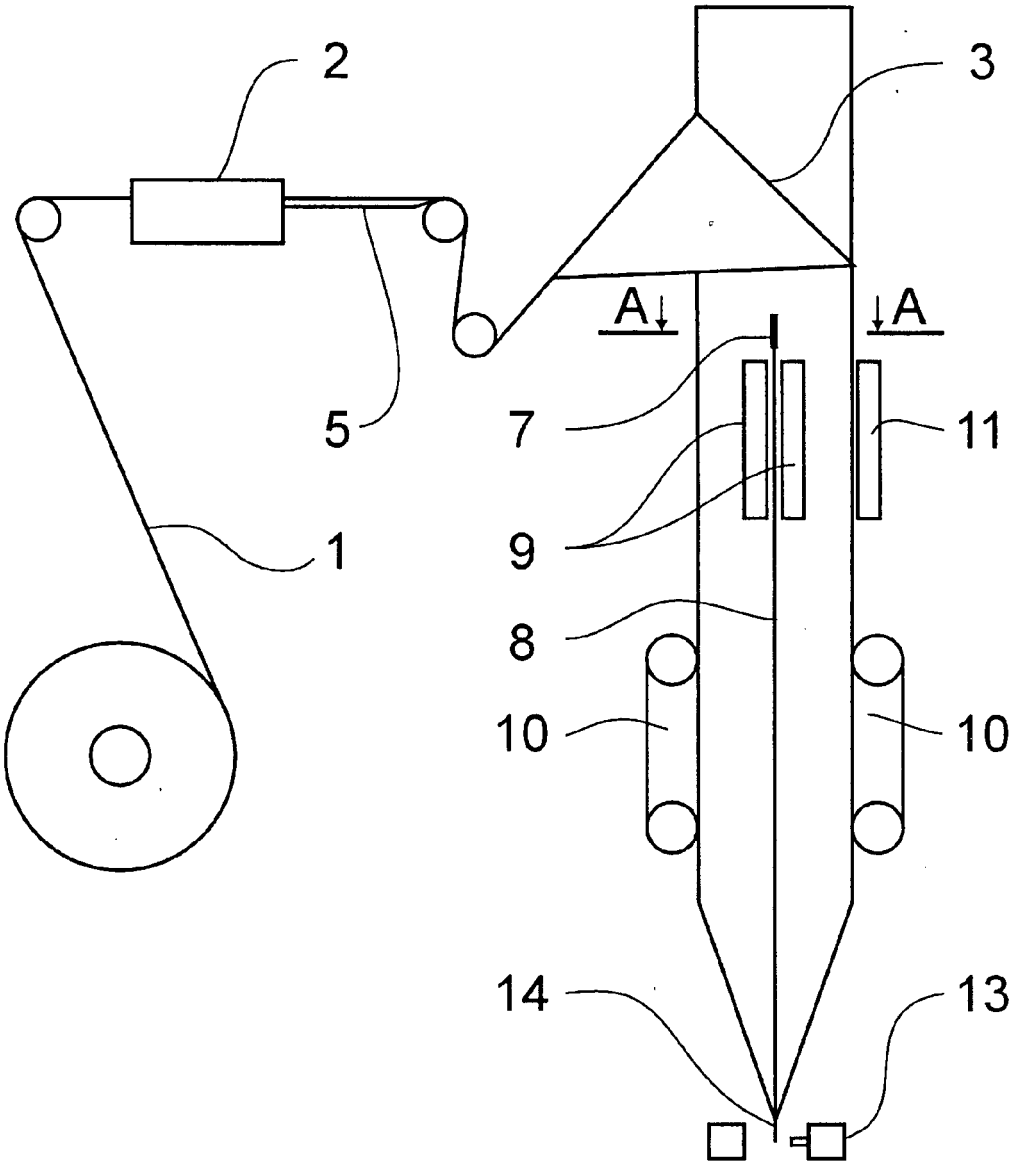

Fig. 1

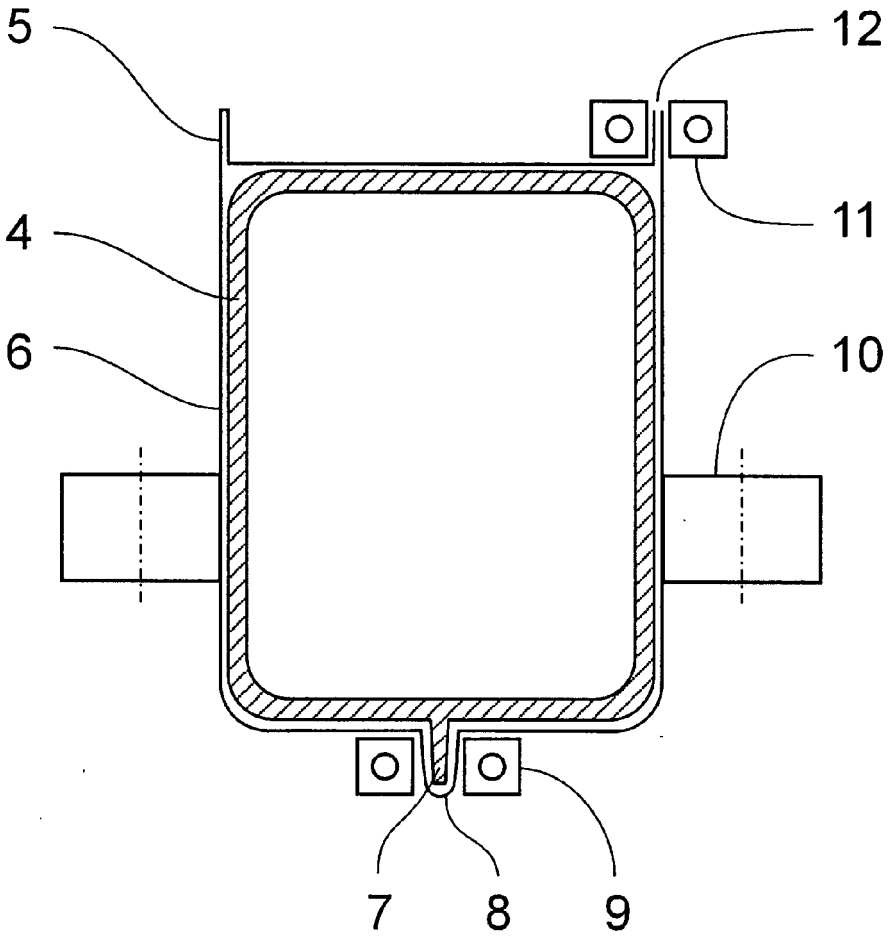

Fig. 2

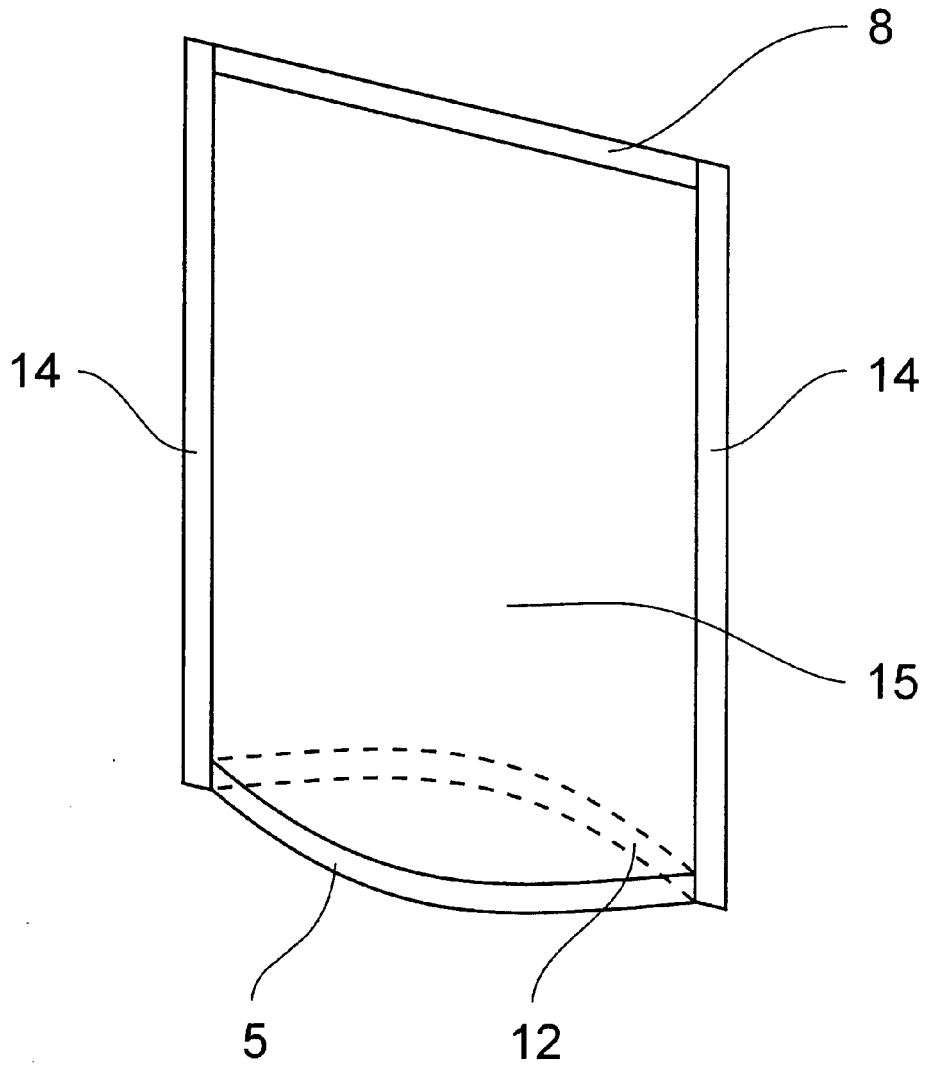

Fig. 3

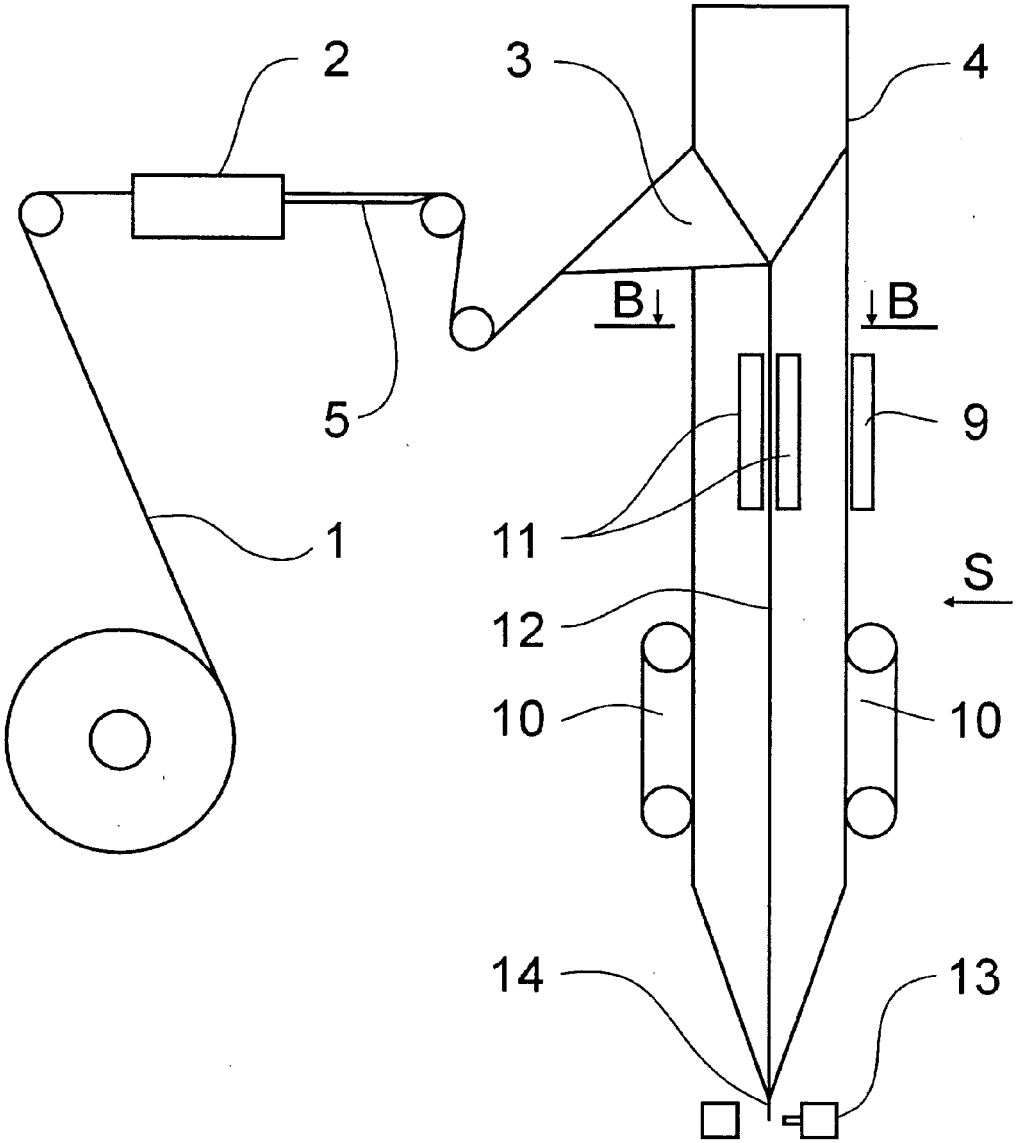

Fig. 4

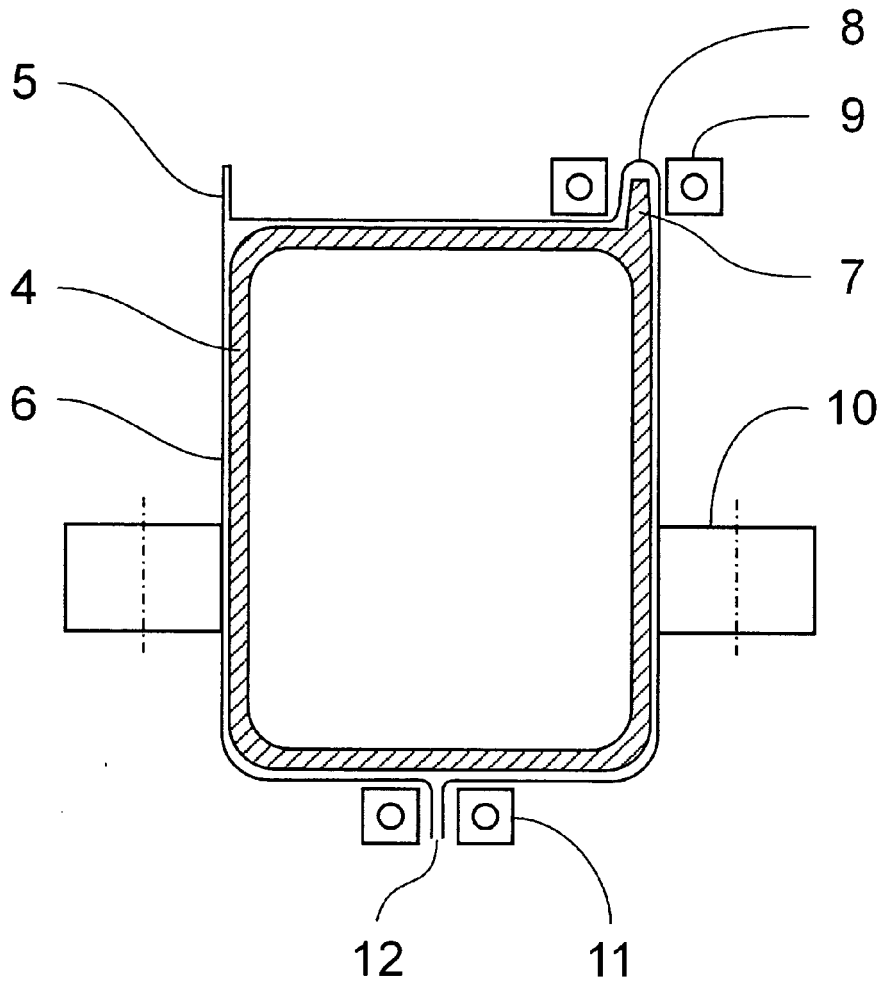

Fig. 5

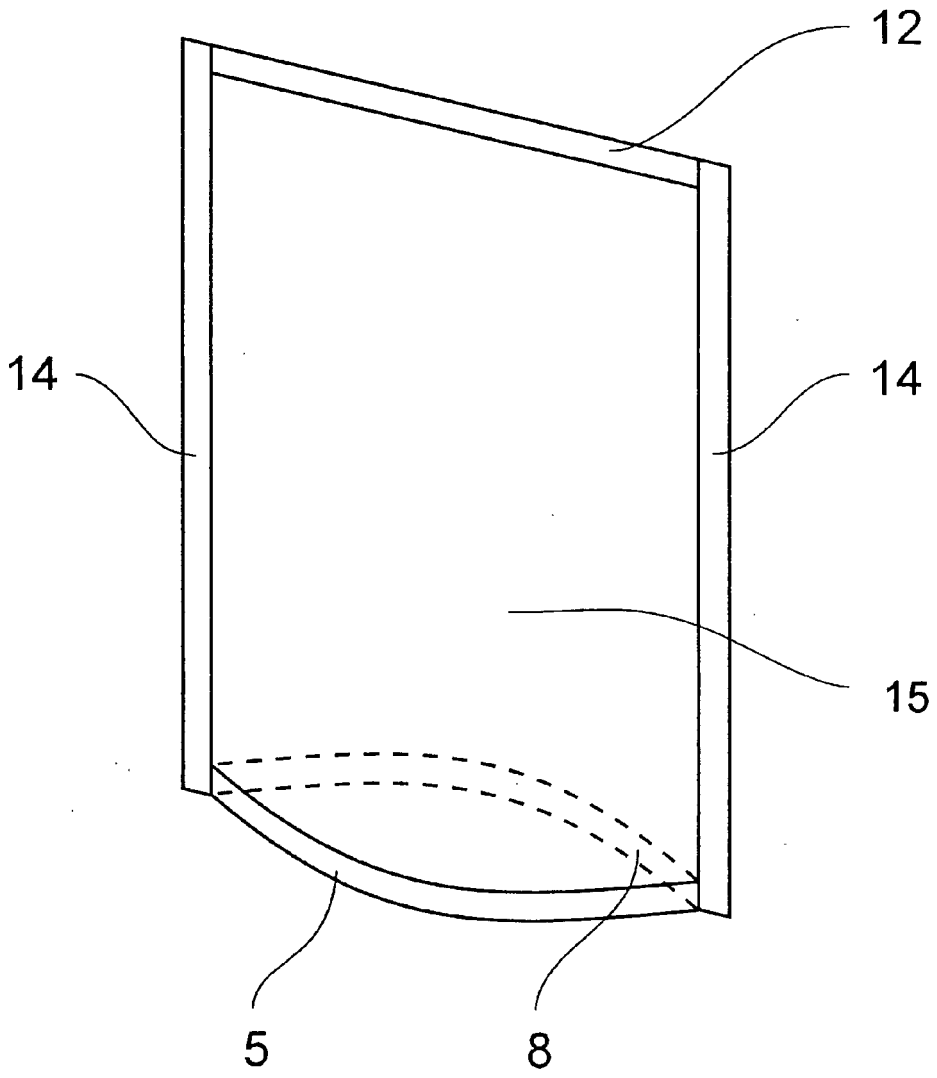

Fig. 6

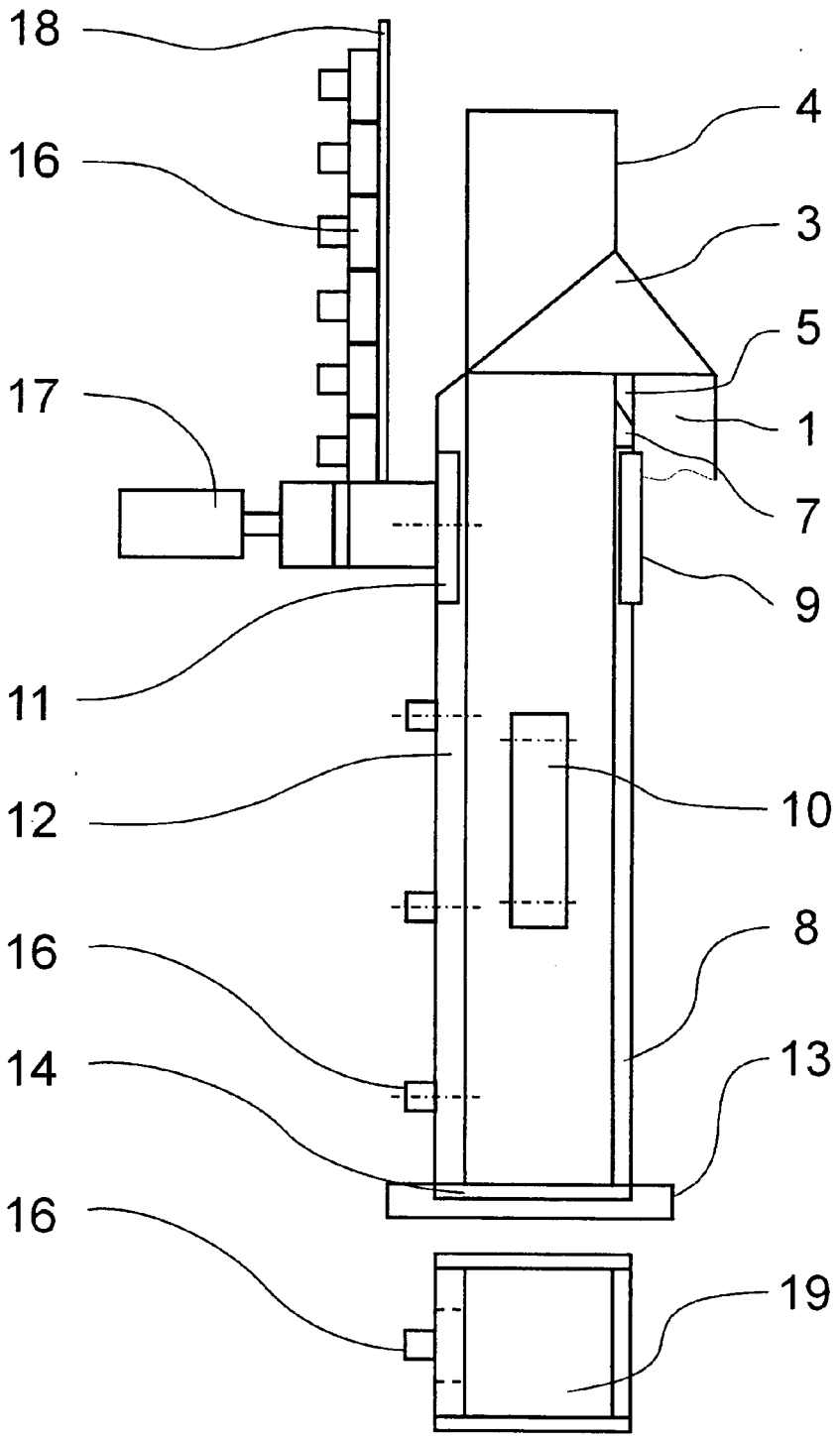

Fig. 7

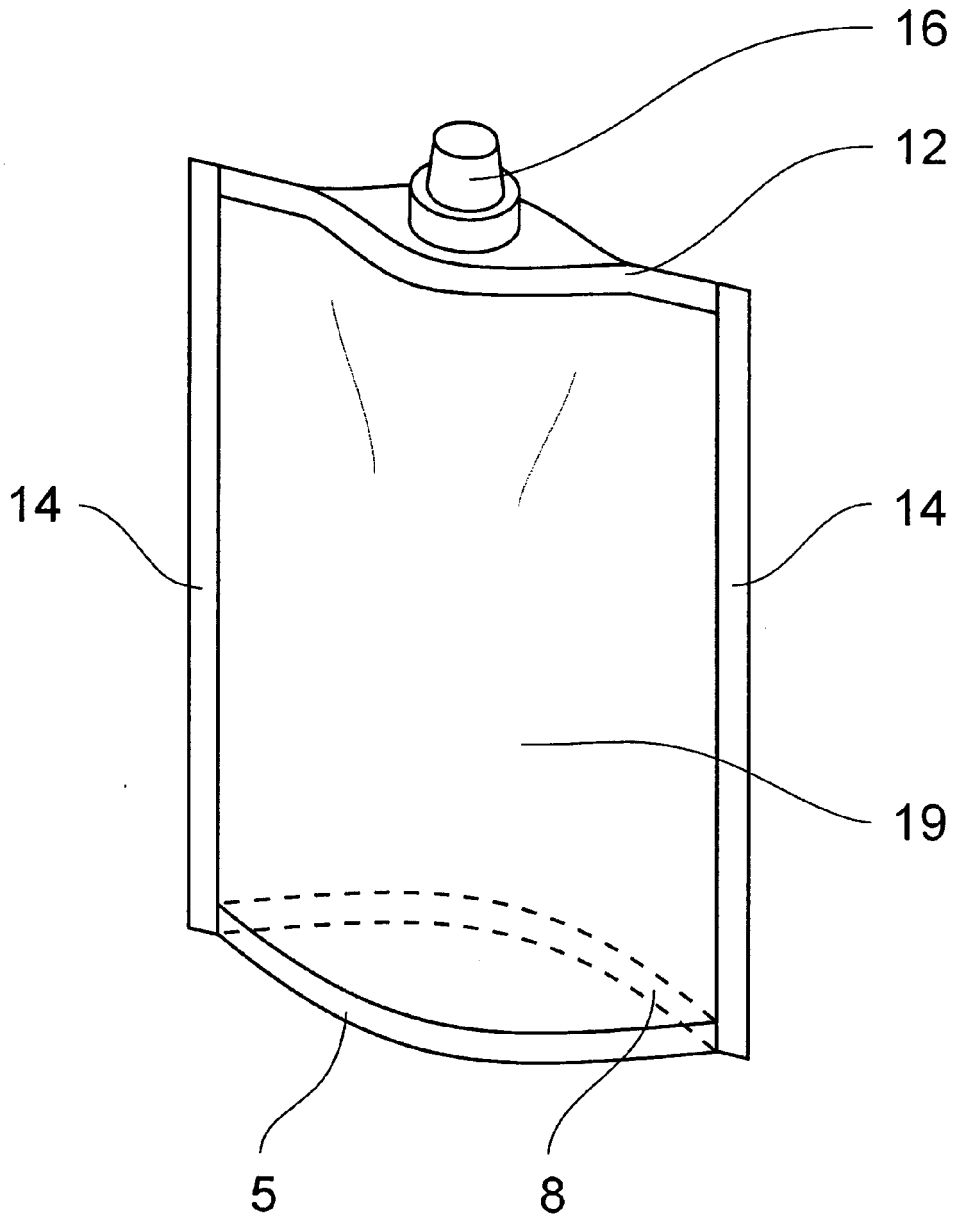

Fig. 8

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 1142786 A2 **[0002]**
- DE 10159053 A1 **[0002]**