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

(11) Publication number: **0 400 826 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **90305016.9**

(51) Int. Cl.5: **B65D 33/36**

(22) Date of filing: **10.05.90**

(30) Priority: **30.05.89 GB 8912372**
07.11.89 GB 8925146

(43) Date of publication of application:
05.12.90 Bulletin 90/49

(84) Designated Contracting States:
AT BE DE DK ES FR GB IT LU NL SE

(71) Applicant: **MEDWAY PACKAGING LIMITED**
Medway House, New Hythe Lane, Larkfield
Maidstone, Kent ME20 6SH(GB)

(72) Inventor: **Chilmaid, Gordon**
13 Lingley Drive
Wainscott, Rochester, Kent ME2 4ND(GB)

(74) Representative: **Wright, Hugh Ronald et al**
Brookes & Martin 52/54 High Holborn
London WC1V 6SE(GB)

(54) Flexible container.

(57) A flexible container (10), including a closed end (16), the closed end being formed by folding an open end portion (19), and joining means joining said folded end portion (19) to the body of the flexible container (10), said joining means being arranged so as to loin said tolaed end portion to said body more strongly over outer sections (26, 27) adjacent each side edge (23, 24) of said flexible container than over an inner section (28) spaced from said side edges.

EP 0 400 826 A1

FLEXIBLE CONTAINER

The present invention relates to a flexible container such as a sack and in particular, a paper sack.

It is a common requirement of flexible containers such as sacks that they should be securely closed so that during transportation and storage the sack remains firmly closed and the contents are retained inside the sack. However, when it is desired to empty the sack of its contents, the sack should be easily openable without any tools.

A variety of means for dealing with this problem have been devised and a colon method is by means of sewing up a closed end of the sack utilising a tape and a particular form of stitching. In normal use the stitching and tape are strong and will maintain the sack closed, but when it is desired to open the sack, the stitching may be grasped at a particular point and readily parted from the sack whereby the end of the sack opened.

Although this arrangement is useful in many circumstances, where the sack is utilised to hold food raw material or products, in particular, there is the possibility that the loose ends of the tape and of the thread used to sew up the sack will become dislodged and enter the food process with undesirable results. There is therefore a demand for a flexible container in the form of a sack which can readily be opened without loose parts of the closure breaking away and joining with the contents of the sack.

Much work has been carried out in this direction and various proposals have been made for meeting the problem.

One of these is shown in European Patent Publication 283279 which shows a sack with a releasable end closure in which a long extended end of the sack is folded over in a particular way to provide a "peak" which is taped down with an adhesive tape (the so-called "cap strip"). To maintain the strength of this sack it is necessary to provide a long fold and the sack can be readily opened by grasping the peak below the cap strip and pulling on that peak portion to disengage the adhesive cap strip. Such an arrangement works quite well but in practice, has disadvantages. One disadvantage is that a considerable extra length of material is required to form the closure which in the very competitive industry of paper sacks can be of considerable economic importance.

Another arrangement is disclosed in UK, Patent Application 2208222. In this, an open end of the sack is folded over and is held closed by means of a tape which adhesively connects the body of the bag and the folded over portion, the tape having a free edge which may be grasped so as to pull the tape off the body of the bag to release the folded up end. The adhesive connecting the tape to the bag must be sufficiently strong to maintain it's integrity and yet at the same time must be disconnectable readily when the bag is to be opened.

US Specification 2 363 957 discloses a envelope or container in which one end is closed by a folded over flap 30. The flap 30 is adhered to the remainder of the envelope by adhesive under lobes 32 spaced towards each side of the envelope, leaving an unadhered portion between, and the actual opened end is sealed by means of releasable adhesive 37. The releasable adhesive 37, forming the main closure of the open end of the envelope extends substantially to either side of the envelope. The unadhered portion between the lobes 32 could allow dirt to collect beneath the flap which in the case of use of a container with food stuff such as flour is unacceptable.

The present invention provides a flexible container, (such as a sack, and in particular a paper sack), including a closed end, the closed end being formed by folding an open end edge, and joining means (such as adhesive, sewing) joining said folded end edge to the body of the flexible container, said joining means being arranged so as to join said folded end edge to said body more strongly over outer sections adjacent each side edge of said flexible container than over an inner section spaced from said side edges.

Thus a relatively simple fold of an open end can be provided to close the open end, and the folded over portion is more strongly joined to the body adjacent the sides of the flexible container where there is most stress and likelihood of failure of the joint, than at a central portion of the container (the "inner section"). This means that the closure over the inner section can be more readily opened.

To prevent ingress of dirt or insects into the sack and to provide a complete seal, the inner and outer sections should be contiguous and extend to the outer sides of the sack.

Preferably said inner section includes a loose edge so that fingers can be inserted under the loose edge to break the joining means at said inner section to thereby open said closed end of the flexible container.

There may be a variety of ways for providing the different strengths of joining means adjacent each side edge of the flexible container and spaced from said side edges.

Thus, the end closure may be closed at the outer and sinner sections by different adhesives, the adhesive at said outer sections being stronger

than at said inner section.

Alternatively, one may use the same adhesive, but modify the body or the folded over edge of said flexible container so that the adhesive adheres more strongly at said outer sections than at said inner section.

An adhesive may be applied in the form of lines and there may be more lines per unit area at said outer section than said inner section so that said outer sections adhere more strongly.

In another arrangement a strip may be interposed at said inner section, said strip member including a strong adhesive on one side and a weaker adhesive on the other. A further advantage of the use of a strip member is that it can be extended so as to form a flap which may be readily grasped by the fingers to break open the sack.

Preferred embodiments of the invention will now be described by way of example only and with reference to the accompanying drawings in which:

Figure 1 is a view of tubes of paper material from which sacks according to the invention may be manufactured,

Figure 2 is a back view of a tube of Figure 1 before folding,

Figure 3 is a back view of a sack incorporating a first to embodiment of the invention,

Figure 4 is a back view of the sack corresponding to the lower part of Figure 3 after it has been opened,

Figure 5 is a diagrammatic back view of a sack incorporating a second embodiment of the invention,

Figure 6 is a view of a sack during manufacture incorporating a third embodiment of the invention,

Figure 7 is a view of the sack of Figure 6 when completed,

Figure 8 is a view of a sack during manufacture comprising a fourth embodiment of the invention, and,

Figure 9 shows a view of a sack comprising a further embodiment of the invention similar to the view shown in Figure 6.

Figure 3 shows the back view of a sack 10. The paper sack is for the storage and transportation of flour, but may be used for other purposes. As is well known, the paper material of the sack 10 may be multi-ply.

Referring to Figure 1 it will be seen that the paper sacks 10 are manufactured from a strip or strips of material(s) which is (are) folded over so that opposite longitudinal edges 12,13 overlap, the opposite longitudinal edges 12,13 being adhesively joined to one another to provide a joint 14. The tubular member thereby produced is divided transversely by suitable cutting means to provide a succession of open ended tubes 10A, 10B from each of which a paper sack may be made.

Conventionally, the sack manufacturer closes a first end 16 of the open ended tubes 10A, 10B (as shown in Figure 2) to form sacks having a second, open, end 17 (as shown in Figure 3) and the user, having filled the sacks, closes the, second, open ends 17 of the sacks.

As is illustrated in Figure 2, the first end 16 of a paper sack 10 is closed by folding an end portion 19 over a fold line 21, the fold line 21 being parallel to the cut open end 16 of the sack 10 and spaced therefrom. The folded over end portion 19 is then connected to the body 22 of the sack 10. In a preferred embodiment to be described, the end portion 19 when folded over is adhesively attached to the body 22. Thus, to do this, adhesive is applied to either the end portion 19 (at 25A) or the body 22 (at 250) just above the fold line 21 across the complete width from side 23 to side 24 of the sack 10.

Such an arrangement is, of course, entirely conventional. However, in the present instance, it is arranged that the end portion 19 is divided into three sections, outer sections 26,27 extending from sides 23,24 inwardly towards the middle of the sack, and a inner section 28 which extends between the two outer sections 26,27. An important aspect is that the outer sections 26,27 of the end portion 19 are more strongly adhered to the body 22 than the inner section 28 of the end portion 19.

This can be arranged in a number of ways, but in one example, a stronger adhesive may be applied over the outer sections 26,27 than over the inner section 28. In another arrangement, in which the adhesive is applied not in a continuous film, but in a series of lines, more lines of adhesive may be applied along the outer sections 26,27 than along the inner section 28.

It is preferably also arranged that, at least over the inner section 28, the adhesive is not applied to the remote end of the end portion 19 (ie adjacent the cut edge 20) so that when the end portion 19 is folded over the fold line 21 and adhesively connected to the body 22, there is a small flap 31 left which may be grasped.

Thus, in use, once the sack has been manufactured as described, it may be filled by the user with the relevant material and the second open end 17 closed as in the conventional manner. The closure of the second open end 17 may be arranged in any manner, since it will remain closed thereafter and it is not necessary for it to be opened at that end.

In use, to remove the material from within the closed sack 10, the flap 31 of the end portion 19 (which as indicated above, may preferably not include adhesive so as to be grasped by the fingers of the hand), may be gripped along the inner

section 28 and pulled so as to break open joint lines 36, 37 between the inner section 28 of the end portion 19 and the body 22. The greater adhesion between the outer sections 26,27 and the body 22 will mean that they remain adhesively closed and so the end portion 19 will tear at the joint line 36 between the outer section 26 and inner section 28, and the joint line 37 between the inner section 28 and outer section 27.

Figure 4 shows the end 16 of the sack after it has been opened in this manner. Material from inside the sack may be poured out via the, now, open section 28.

Furthermore, because there are no loose parts arising as a result of this opening process, there is no likelihood of loose parts such as loose ends of thread becoming disconnected and joining the flow of material out of the sack 10.

Of course, it will be understood that the use of the stronger adhesive over the outer sections 26,27 is necessary because most of the forces tending to undo the end portion 19 will arise adjacent the sides 23,24. So long as the end portion 19 adjacent the sides 23,24 is maintained firmly closed by the use of the stronger adhesive over the outer sections 26,27, less strong adhesive can be used in the central portion over the inner section 28.

Figure 5 shows a configuration of adhesive which may be used to provide the different strengths of adhesive over the outer and inner sections. Thus, the end portion 19 and adjacent part of the body 22 is provided with adhesive of the thermal acting adhesive type, and heat is applied in the pattern shown. It will thus be seen that there is considerably greater proportion of active adhesive over the outer sections 26,27 than over the inner section 28 and indeed over the inner section 28 there is no adhesive adjacent the edge of the end portion 19 to provide the finger inserting flap 31.

It is inconvenient to provide separate types of adhesive for the outer sections 26,27 and for the inner section 28. The provision of two separate adhesives can be avoided as shown in Figure 8 by printing an area 35 of lacquer or like material onto the surface of the area of the inner section 28, so that a single adhesive can be used, the adhesive more strongly adhering to the body 22 over the outer sections 26,27 where the lacquer is not present, than over the inner section 28 where the lacquer is present.

An alternative configuration is shown in Figure 6. In this case it will be seen that the end 16 is not provided by a single cut across the width of the tubular material as shown in Figure 1, but the plies of each side of the sack 10 are cut in a staggered manner. Thus, in Figure 6 which shows the sack in the configuration similar to that in Figure 2, that is before folding over of the end portion 19, it will be seen that the sack which in the Figure is a two ply material has free lengths of the opposite (ie from) outer ply 32A, the opposite inner ply 32B, the nearside (ie back) inner ply 33B and the nearside outer ply 33A. Such an arrangement makes for stronger closed end.

Over the inner section 28, there is provided on the body 22 of the sack 10 a strip of material which has weak adhesive on one side. This strip 34 is attached to the body 22 by means of the weak adhesive.

Strong adhesive is then applied across either the area 25 of the body 22 which is to be engaged with the end portion 19 or across the end portion 19 itself. In the latter case, strong adhesive will be applied between the plies 32A, 32B, 33A, 33B and across the strip 34. The end portion 19 is then folded over the fold line 21.

The effect of this is that the end portion 19 is strongly adhered to the body 22 of the sack over outer sections 26,27 (defined as being the lengths on either side of the strip 34), and because the strip 34 is only weakly adhered to the body 22, the strip 34 provides the weakly adhering inner section 28.

The strip 34 may be arranged so that it does not have weak adhesive over its entire surface so that when the end portion 19 is folded over as shown in Figure 7, part of the strip 34 forms a pocket 31.

In a preferred arrangement, lines of weakness may be provided at the joints 36,37 extending parallel to the length of the sack 10 between the outer sections 26,27 and the inner sections 28. This helps the end portion 19 to rip open.

Referring to the Figure 9 (and similar parts carry the same reference numerals as the corresponding parts in the earlier Figures) the sack 10 includes a plurality of plies 32A, 32B, 33A, 33B. The change in the present arrangement is that whereas in the earlier Figure 6, (to which this arrangement generally corresponds) each of the plies was cut across its complete width in the form of a straight line, in the present case, the ply 32B includes two outermost portions 321 and 322 cut as before, and a central portion 323 cut so that it overlies the adjacent ply 32A and its cut edge may be contiguous with the cut edge of the ply 32A.

When folded over about the line 21, in the area of the strip 34, the two plies 32A, 32B, overlie one another so that in this central area, there is added strength to the part of the sack which will be gripped and pulled to open the sack.

In yet another alternative arrangement, in this case an alternative arrangement of the embodiment of Figure 5, in place of the crossed lines of adhesive as shown in Figure 5, similar lines of printed lacquer are provided, adhesive being applied

across the lacquer or across the surface which will be folded into contact with the lacquered surface and by controlling the relative area of the lines of lacquer (which does not adhere well to the adhesive), the effective strength of the adhesive can be controlled. In place of the lines shown in Figure 5, one can provide areas of lacquer in the form of an array of shapes such as circular dots, triangles or diamonds, and the relative sizes of these dots, triangles or diamonds of lacquer to non-lacquered surface may be increased or decreased across the area where the adhesive is to be applied so as to vary the effective strength of the adhesive.

In place of printed lacquer one might use other printed materials such as ultra violet cured ink to which a hot melted adhesive will not readily adhere and thus by varying the relative proportion of the printed to non printed parts (i.e. by varying the size of the dots or triangles or diamonds), one can change the effective strength of the adhesive.

Such an arrangement of use of other printed materials such as ultra violet cured ink with hot melted adhesive enables one to manufacture the sack in a slightly different way. The arrangements thus far described show the first closed end of the sack closed in accordance with the invention. This process is normally carried out by the sack manufacturer; the sack is then shipped to the user and the user closes the opposite end of the sack in a conventional manner by for example adhesive or sewing. With the use of hot melted adhesive and other printed materials such as ultra violet cured ink, it is possible to provide the closure of the invention on the end of the sack which is closed by the user since that second end can be printed with other printed materials such as ultra violet cured ink, and provided with the hot melted adhesive and the user can simply close that second end by folding over the second end and melting the adhesive in the normal manner.

The invention is not restricted to the details of the foregoing examples.

Claims

1. A flexible container (10), including a closed end (16), the closed end (16) being formed by folding an open end portion (19), and joining means (25, 25A, 25B) joining said folded end portion (19) to the body of the flexible container (10), said joining means (25, 25A, 25B) being arranged so as to join said folded end portion (19) to said body more strongly over outer sections (26, 27) adjacent each side edge (23, 24) of said flexible container (10) than over an inner section (28) spaced from said side edges (23, 24).

2. A flexible container as claimed in claim 1 characterised in that the inner (28) and outer (26, 27) sections are contiguous and extend to the outer side edges (23, 24) of the container (10).

3. A flexible container as claimed in claim 1 or 2 characterised in that said inner section (28) includes a loose edge (31) so that fingers can be inserted under the loose edge (31) to break the joining means (25, 25A, 25B) at said inner section (28) to thereby open said closed end (16) of the flexible container (10).

4. A flexible container as claimed in claims 1 to 3 characterised in that the closed end (16) is closed at the outer (26, 27) and inner (28) sections by different adhesives, the adhesive at said outer sections (26, 27) being stronger than at said inner section (28).

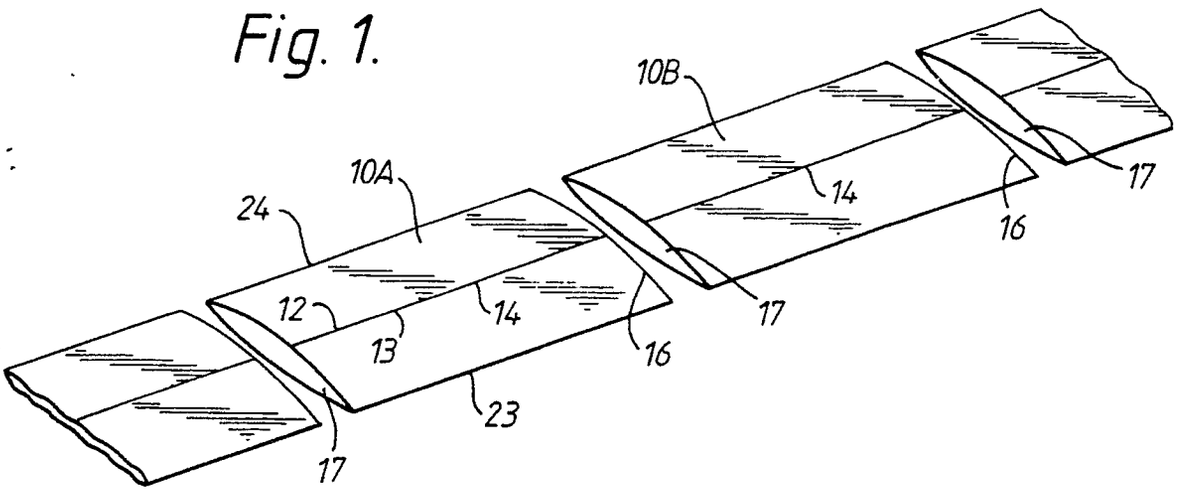
5. A flexible container as claimed in any of claims 1 to 3 characterised in that the closed end (16) is closed by an adhesive and part or parts of the body or the folded over section (19) of said flexible container are modified so that the adhesive adheres more strongly at said outer sections (26, 27) than at said inner portion (28).

6. A flexible container as claimed in any or claims 1 to 3 characterised in that the closed end (16) is closed by an adhesive which is applied or activated in the form of lines and there are more lines per unit area at said outer portions (26, 27) than at said inner section (28) so that said outer sections (26, 27) adhere more strongly.

7. A flexible container as claimed in any of claims 1 to 3 characterised in that the closed end (16) is closed by adhesive and a strip member (34) is interposed at said inner section (28), said strip member including a weak adhesive on one side.

8. A flexible container as claimed in claim 7 characterised in that strip member (34) is extended so as to form a flap which may be readily grasped by the fingers to break open the container (10).

Fig. 1.


10B
10A
24
14
17
16
12
13
14
16
17
23
17

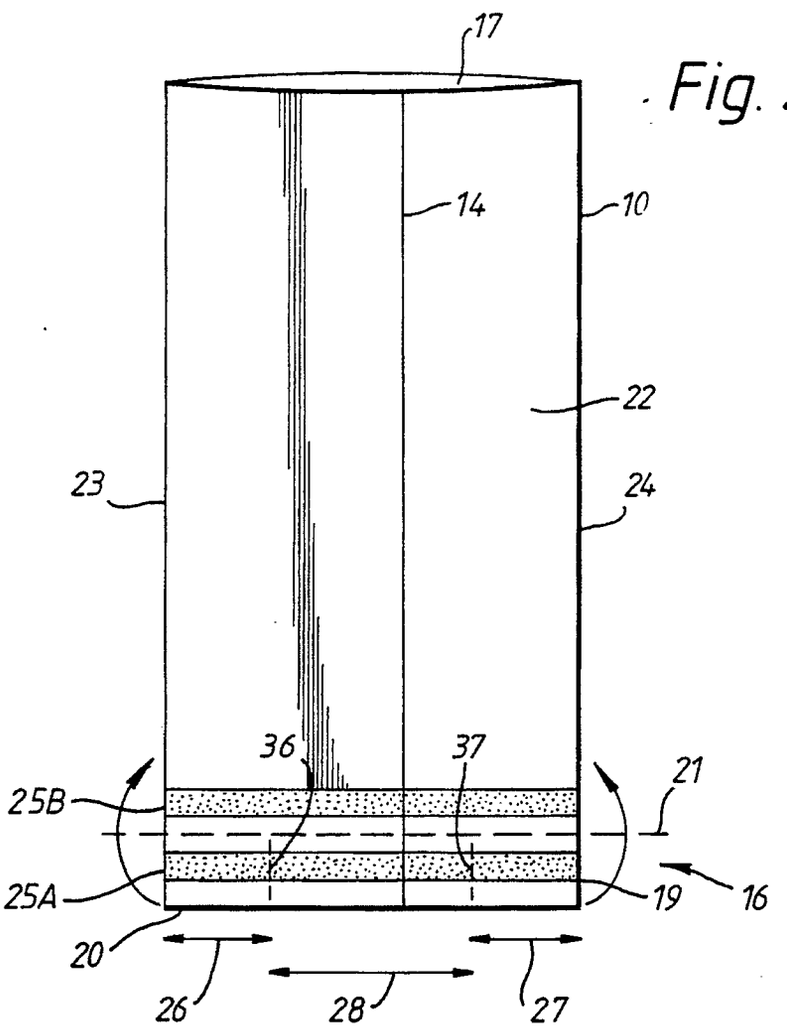

17
14
10
22
23
24
36
37
21
25B
25A
19
16
20
26
28
27

Fig. 2.

Fig. 3.

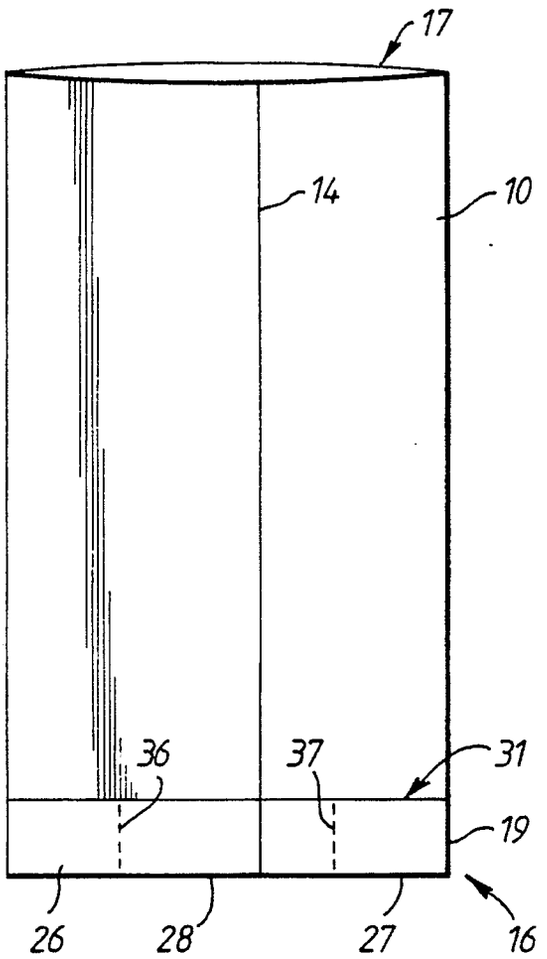


Fig. 4.

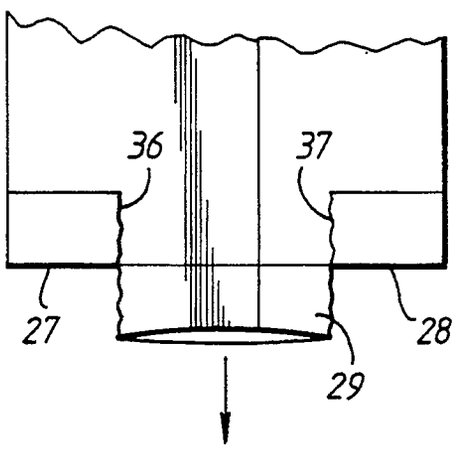
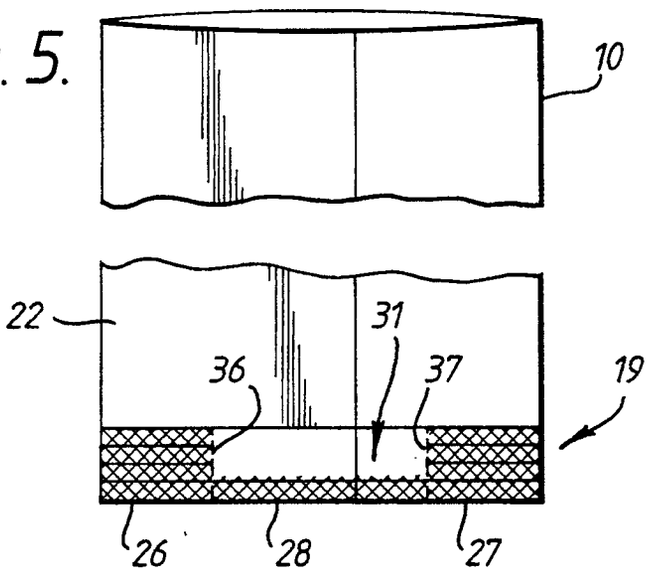


Fig. 5.



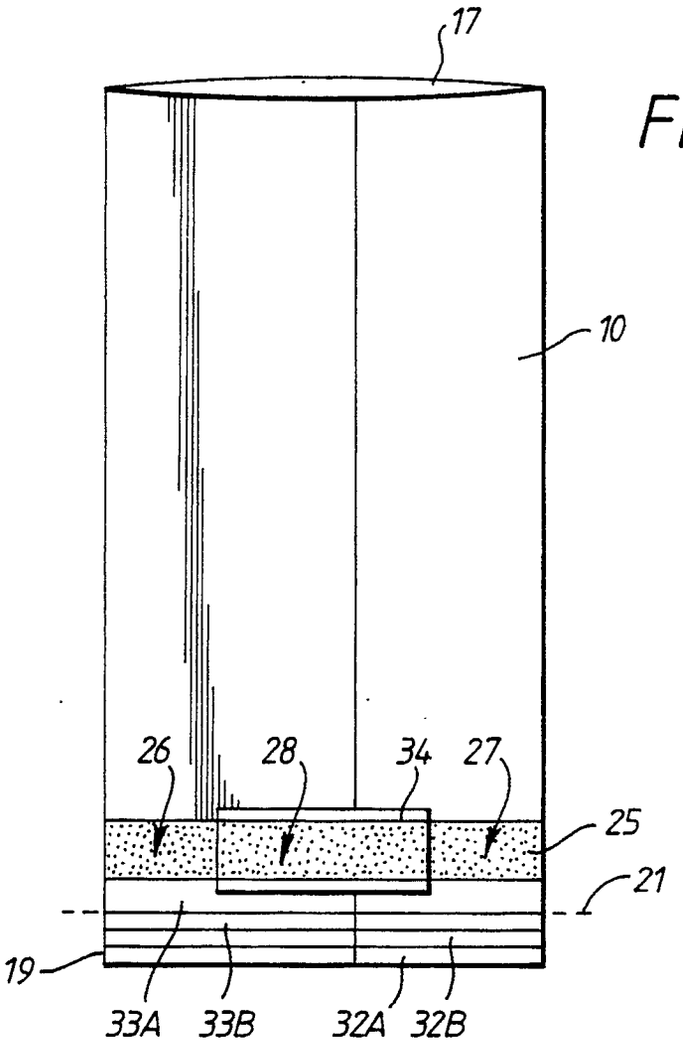


Fig. 6.

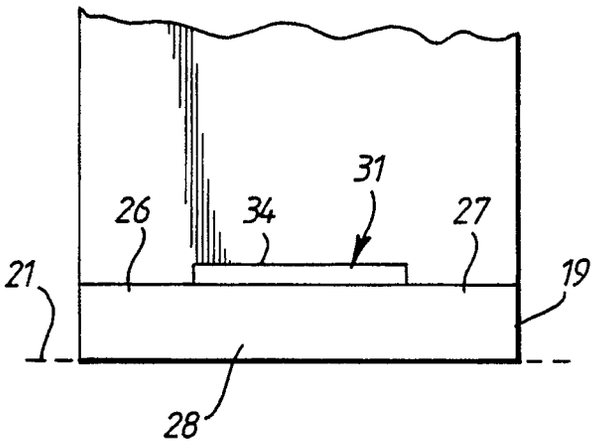


Fig. 7.

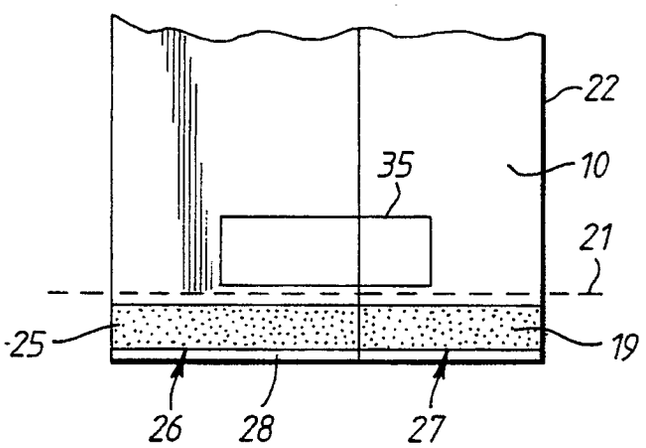

22
35
10
21
25
19
26
28
27

Fig. 8.

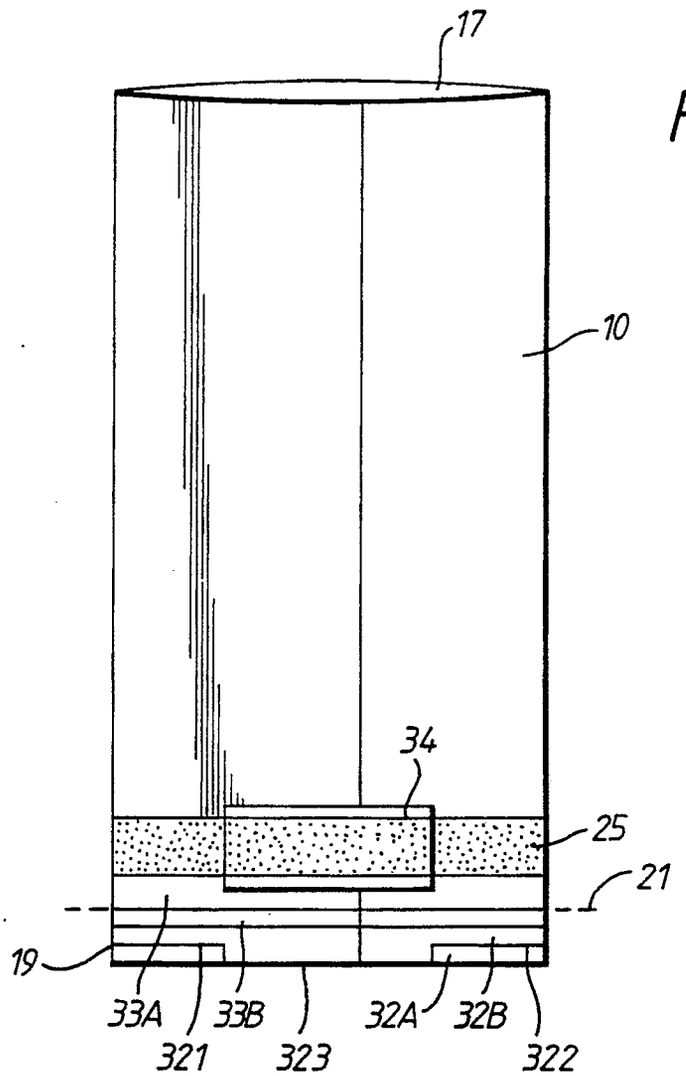

17
10
34
25
21
19
33A
33B
32A
32B
321
323
322

Fig. 9.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 30 5016

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y,D	US-A-2 363 957 (GOFF) * Page 2, right-hand column, line 69 - page 3, left-hand column, line 12; figures 2-7 *	1-5	B 65 D 33/36
Y	US-A-4 512 479 (L. HAIN) * Column 2, line 26 - column 3, line 16; figures 1,2 *	1-5	
A	FR-A-2 150 897 (COLGATE-PALMOLIVE) * Claim 1; figures *	6	
A	US-A-4 483 445 (L. HAIN) * Abstract; figures *	1	
A	US-A-3 827 625 (MILLER) * The whole document *	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	26-06-1990	MARTINEZ NAVARRO A.

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

EPO FORM 1503 03.82 (P0401)