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

(11) Publication number: **0 248 973 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **87100846.2**

(51) Int. Cl.4: **B65D 81/32** , B65D 25/08

(22) Date of filing: **22.01.87**

(30) Priority: **30.05.86 FI 862296**

(43) Date of publication of application:
16.12.87 Bulletin 87/51

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

(71) Applicant: **Oy G.W. Sohlberg AB**
PL 25
SF-02171 Espoo 17(FI)

(72) Inventor: **Ranta, Pentti**
Kyösti Kallion tie 10 D 48
SF-00570 Helsinki(FI)

(74) Representative: **Kuhnen, Wacker & Partner**
Schneggstrasse 3-5 Postfach 1729
D-8050 Freising(DE)

(54) Two-component container with piercing mechanism.

(57) This publication describes a two-component container (10), which is divided by a compartmental wall (8) into two compartments (I and II) for two different kinds of material. One of the compartments (e.g. II) is provided with a separate piercing member (13), which is provided with a blade part (2) pointing against the compartmental wall (8). When the can is pushed by the outer wall, the blade part (2) of the piercing member (13) punches a hole in the compartmental wall (8) to allow mixing the materials of both compartments (I and II) without opening the can. In accordance with the invention, the maximum dimension of the piercing member (13) in a plane orthogonal to the container axis is at least approximately half of the diameter of the aforementioned second compartment (II) and the piercing member (13) is provided with a support member (7), which makes the combined maximum dimension of the support member (7) and the piercing member (13) in a plane orthogonal to the container axis to be at least approximately of the same order of magnitude with the diameter of the aforementioned second compartment (II), which provides a reliable piercing mechanism of the compartmental wall (8) and allows the container cover (9) to be permanently attached to the container.

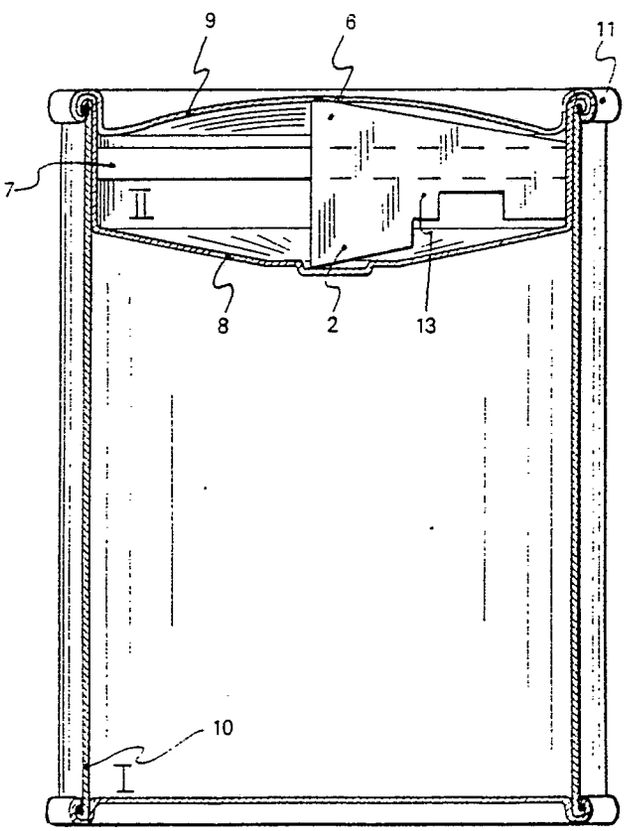

Fig. 4

EP 0 248 973 A1

Two-component container with piercing mechanism

The present invention relates to a two-component container in accordance with the preamble of claim I.

Two-component containers are used, for instance, for handling two-component cements, which release noxious gases, by making the reaction between the components take place in a gastight space, separated from the environment, by means of a piercing mechanism. During the mixing, the components form the desired cementing composition, which can be applied to a desired object.

A prior-art invention described in FI patent publication 57 378 comprises two concentric containers and a cover with the inner container holding a piercing mechanism, whose construction consists of a separate piercing member fabricated in one piece and with its maximum dimension in the orthogonal direction to the axis of the container being at least of the same order of magnitude with the diameter of the inner container.

A drawback of prior-art technology is that due to the construction of the piercing member used, the hole pierced at the compartmental wall of the inner container in practice is formed at the circumferential area, which makes the mixing of components inefficient. Due to the method of piercing the hole at the circumferential area, the piercing mechanism is so unreliable as to require in practice the cover to be adapted removable, which deteriorates the system's hermeticity.

The aim of the invention is to overcome the drawbacks of the aforementioned prior-art technology and to provide a novel piercing mechanism for a two-component container.

The invention is based on providing a piercing member whose maximum dimension in the plane orthogonal to the inner container axis extends to approximately half way of the container diameter, and which is complemented with a support member, which makes the combined maximum extension of the support member and the piercing member in the plane orthogonal to the container axis to be approximately of the magnitude of the container diameter.

More specifically, the mechanism in accordance with the invention is characterized by what is stated in the characterizing part of claim I.

The invention offers substantial benefits.

The piercing mechanism in accordance with the invention pierces the hole in the center of the inner container compartmental wall, which makes the mixing effective. By means of the support member, the piercing member is centered and the reliability of the piercing mechanism increases so much as to allow the cover to be permanently attached to the can, which improves the hermeticity of the container and simultaneously increases the allowable storage time of the material.

In the following, the invention will be examined in more detail by means of the exemplifying embodiments in accordance with the attached drawings.

Figure I shows a pressed blank of the piercing member.

Figure 2 shows the bending of the blank shown in Figure I into the final form.

Figure 3 shows in side view the piercing member in accordance with Figure 2 with the support member attached.

Figure 4 shows in cut side view the piercing member in accordance with Figure 3 inserted in a two-component container.

Figure 5 shows in cut side view the first pass of the end seal fabrication of the container in accordance with Figure 4.

Figure 6 shows in cut side view the second fabrication pass of the seam in accordance with Figure 5.

Figure 7 shows in cut side view the seam in accordance with Figure 5 in final form.

Figure I shows a possible solution for fabricating a blank I for the piercing member of a piercing mechanism. The blank I can be divided into an upper part 6, a blade part 2, and blade support flaps 3. The support flaps 3 are bent outwards from the plane of the blank I, after which the blank I is bent in accordance with Figure 2 into a V-shape by using a punch 5 and an anvil 4. To the other side of the bent blank is attached in accordance with Figure 3, e.g. by welding, an oblong support member 7, fabricated of thin sheet metal. In accordance with Figure 4, a can 8 forms compartment II and the part of the container remaining below it forms compartment I. The piercing member I3 with its support member is inserted in the inner can 8 of the two-component container so that the support member 7 is essentially perpendicular to the longitudinal axes of cans I0 and 8. Then, the blade part 2 rests against a downward convex wall of the inner can 8, fabricated of a thin material, e.g. aluminum, and the upper part 6 is either resting against the upwards concave cover 9 or located to its immediate vicinity. The largest dimension of the piercing member blank I is approximately of the same magnitude with the inner can 8 diameter, which makes the largest dimension of the bent blank I to be in the order of magnitude with the can radius. Due to the chosen blank length, the blade part 2 becomes located essentially to the center of

the can 8. Because the support member 7 inhibits the sideways movement of the piercing member I3, the piercing of the inner can 8 bottom takes place extremely reliably when the blade part is pressed through the center of the can cover 9. Then, the upper part 6 of the piercing member I3 under the cover 9 mediates the piercing force and the blade part 2 punches a hole in the center of the inner can 8 bottom to allow the contents of the inner can 8 to flow into the lower can I0 for effective mixing.

Thanks to the reliable piercing mechanism, a seam II of the container can be fabricated so that the cover 9 of the container is non-detachable. The fabrication is accomplished in accordance with Figures 5...7 by applying in accordance with Figure 5 to the inner surface of the cover part 9, an adhesive-like sealing material I2 and providing an essentially larger folding margin at the cover part 9, compared with the margin of can parts 8 and I0. Using a prior-art method, the edge of the cover part 9 is roll-bent over the prefolded edges of can parts 8 and I0 in accordance with Figure 6; and also using a prior-art method, the seam is completed in accordance with Figure 7. Then, the sealing material I2 provides hermeticity for the entire container assembly.

Claims

I. A two-component container (I0), e.g. a cylindrical can, which is divided by a compartmental wall (8), at least approximately perpendicular to the direction of the container axis, into two compartments (I and II) for two different kinds of material, which, when desired, can be mixed with each other, for which purpose one of the compartments (e.g. II), is provided with a separate piercing member (I3), which comprises a blade part (2) abutting the compartmental wall (8) and an upper part (6) contacting the external wall of the container, e.g. a cover (9), so that when the container is pushed on the aforementioned outer wall, the blade part (2) of the piercing member (I3) punches a hole in the compartmental wall (8) to allow mixing the materials in both compartments (I and II) without opening the container,

characterized in that

the maximum dimension of the piercing member (I3) in a plane orthogonal to the container axis is at least approximately half of the diameter of the aforementioned second compartment (II) and the piercing member (I3) is provided with a support member (7), which makes the combined maximum extension of the support member (7) and the piercing member (I3) in a plane orthogonal to the compartment axis to be at least approximately of the same magnitude as the diameter of the aforementioned second compartment (II).

2. A container in accordance with claim I, **characterized** in that the upper part (6) of the piercing member (I3) is in contact with the inner surface of the cover (9) at least approximately in the center part of the cover, while the blade part (2) is in contact with the inner surface of the compartmental wall (8) of the inner can on its center area.

3. A container in accordance with claim I, **characterized** in that the outer can (I0), the inner can (8) and the cover (9) are attached to each other by roll-bending the adhesive-like sealing material I2 covered edge of the cover (9) over the preformed edges of cans (I0 and 8) to provide a hermetic can seal.

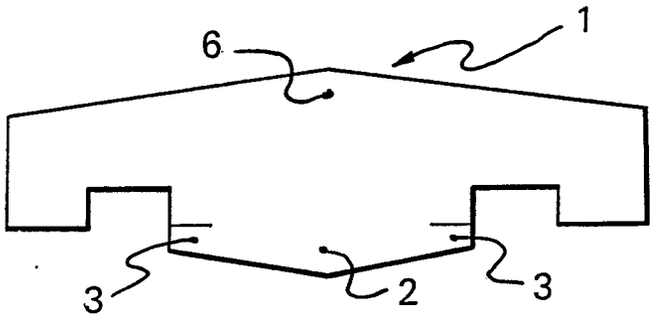

Fig. 1

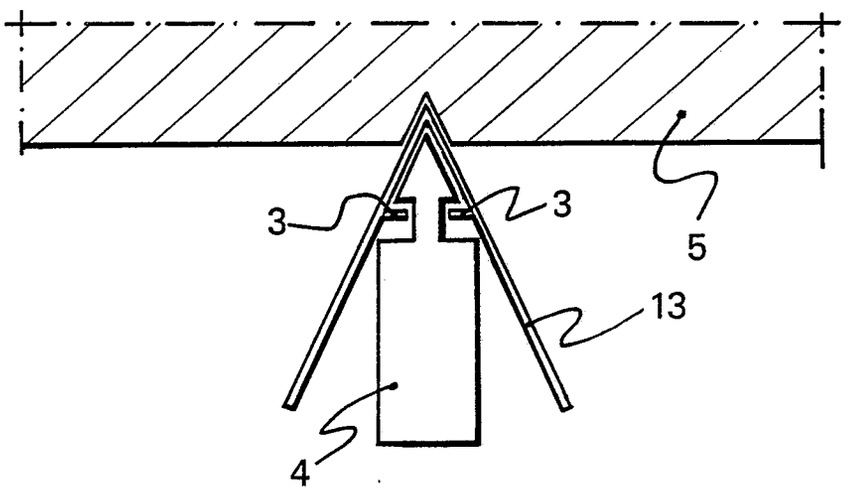

Fig. 2

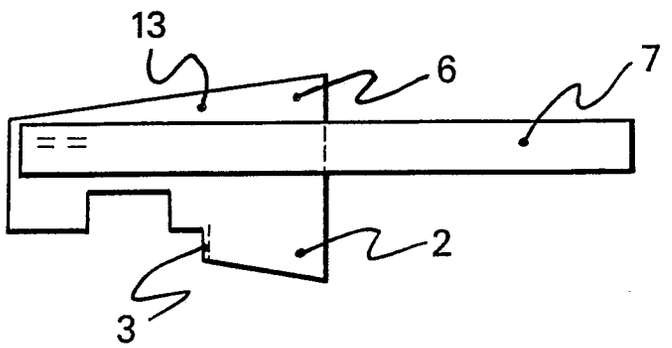

Fig. 3

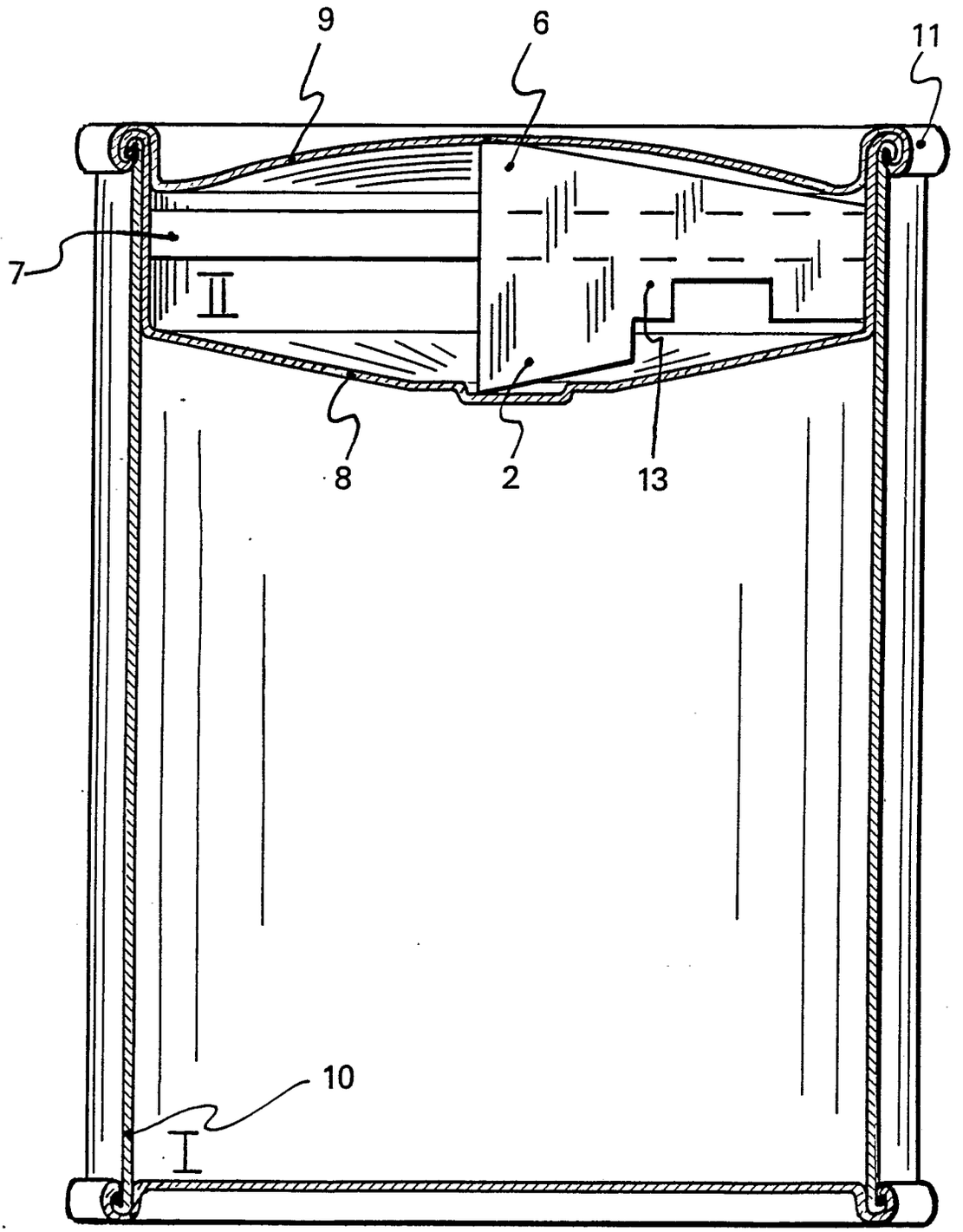

Fig. 4

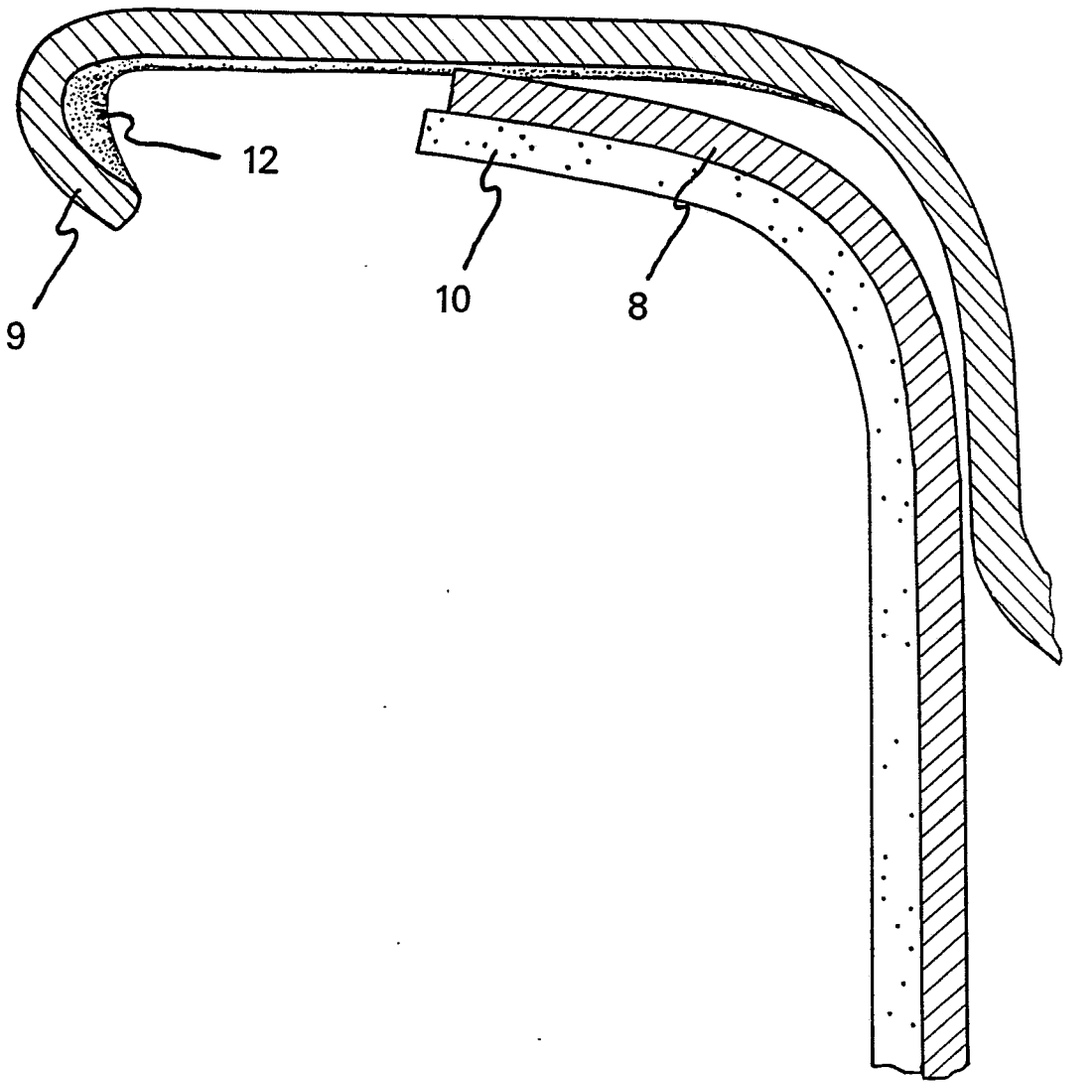

Fig. 5

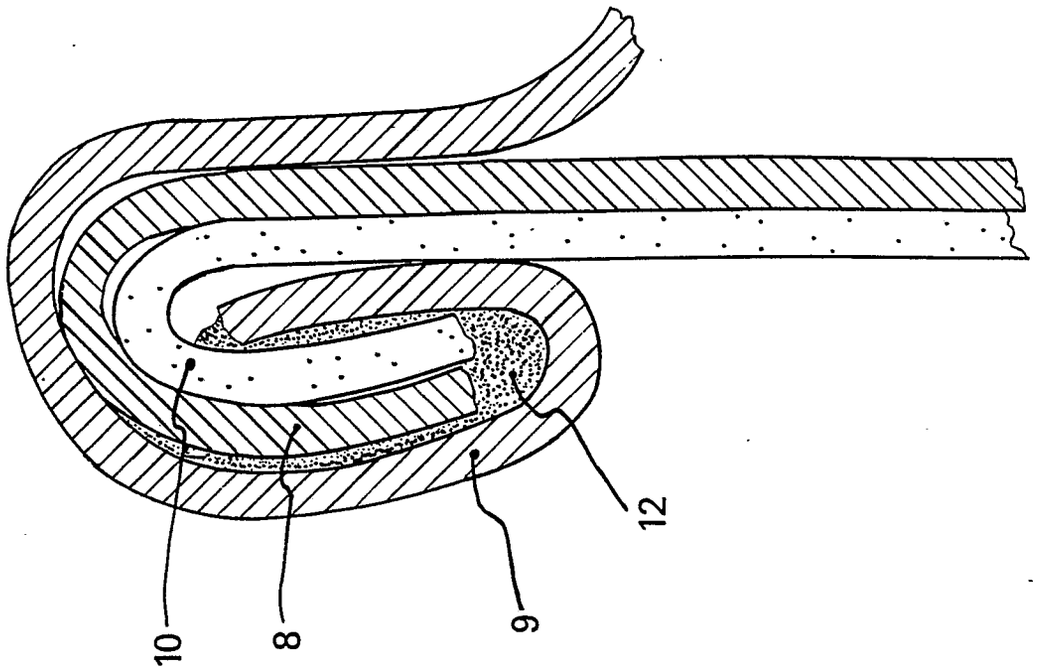

Fig. 7

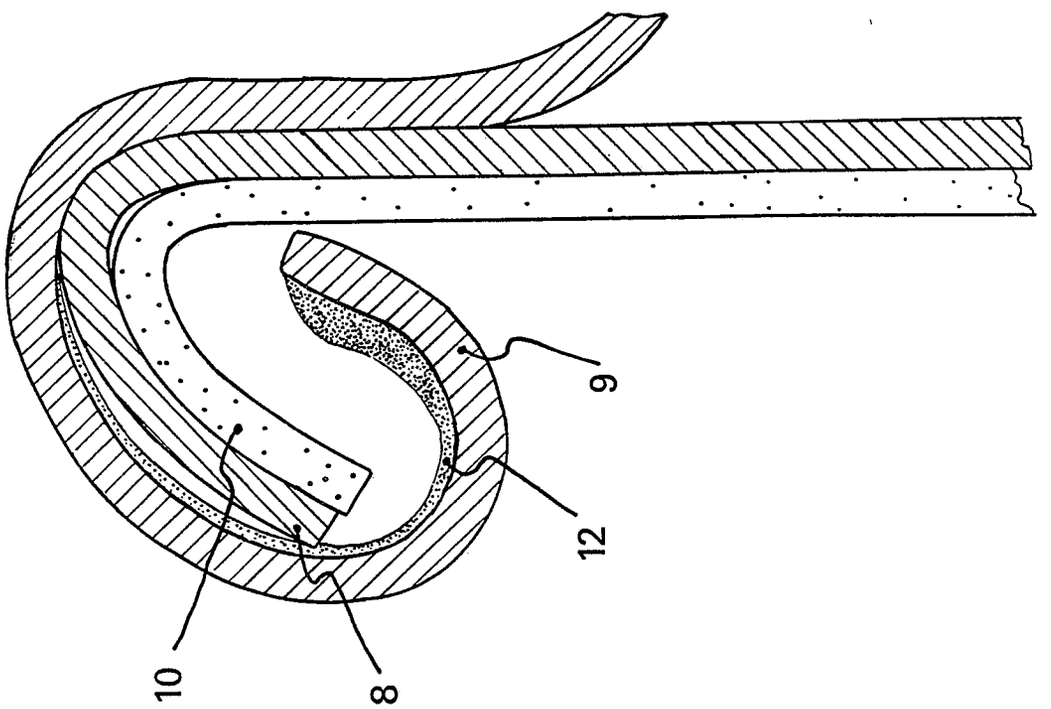

Fig. 6

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 87 10 0846

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.4)
A	FR-A-2 289 407 (HENKEL & CIE) * Figures 1,3,4; page 5, lines 6-20; claims 1,3,9 *	1,2	B 65 D 81/32 B 65 D 25/08
A	US-A-3 385 503 (P.W. STUMP) * Figures 1,3,4; column 2, lines 52-56 *	3	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

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	09-09-1987	PERNICE,C.

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