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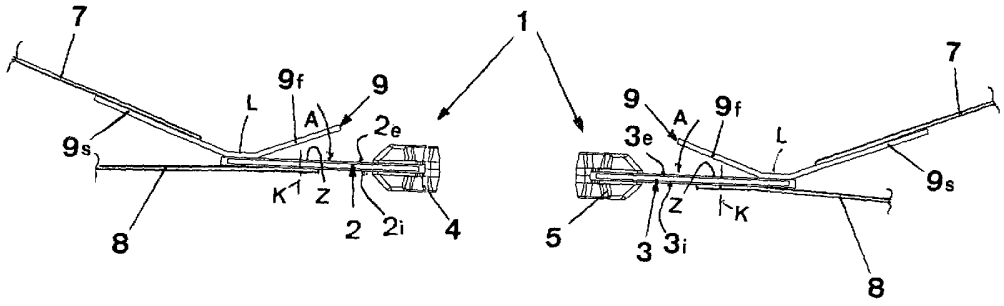
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) **Title:** METHOD OF SEALING THE JOIN BETWEEN A ZIP AND A GARMENT WITH A LINING



(57) **Abstract:** A description is given of a method of sealing the join between the two tapes (2, 3) to which the teeth (4, 5) of a waterproof zip (1) are attached and two edges of a garment composed of a first or waterproof layer (7) and a second or fabric layer (8), these layers being superimposed on each other, which comprises the following steps: a) applying, to a first side (2e, 3e) of each of the said two tapes (2, 3), a strip (9) of heat-weldable textile material attached to it, by at least one weld line (L) formed along a longitudinal line, in such a way that each strip (9) comprises a first unattached flap (9f) and a second unattached flap (9s), one on each side of the said weld line (L) and both parallel to the lines of teeth (4, 5) of the zip (1); b) welding the edge of the said first or waterproof layer (7) to one face of the flap (9s) furthest from the teeth (4, 5) of the zip (1); c) attaching the edge of the said second layer (8) to the second side (2i, 3i) of each of the said tapes (2, 3) by means of a seam (K) in an area (Z) situated between the said weld line (L) and the zip (6); d) folding down the flap (9f) nearest to the teeth (4, 5) of the zip (1) so that it lies parallel against the said first side (2e, 3e) of the corresponding tape (2, 3) and entirely covers the said area (Z); and e) forming another weld (N) that hermetically joins the outline of the outer edges of the flap (9f) to .1 the corresponding tape (2, 3) around the said area (Z).

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Method of sealing the join between a zip and a garment with a lining

The present invention relates to the technological area of waterproof garments, for nautical sports, leisure or similar purposes, composed of two superimposed layers, one of which is waterproof and the other of fabric, the layers having one or more waterproof zips whose teeth are attached to two adjacent tapes connected to the two opposite edges of the garment.

Although no major problems are encountered when hermetically joining together the said tapes and the waterproof layer by a welding process, a problem arises when the tapes are to be attached to the fabric of the other layer. This operation necessarily requires making a seam, through the holes of which, although partially occluded by the thread of the seam, water can get in, which defeats the object of using a waterproof zip.

The prior art seeks to avoid this problem by the application of flaps of complicated configuration which, when folded against the zip and the seams, protect the seams, largely mechanically, from water ingress.

This system is not only fiddly to apply but also not very dependable, and is not a one hundred percent reliable solution.

To avoid the problems explained above, the inventor of the present innovation has devised what is as far as he is aware a novel method involving the application by welding to the said tapes strips of heat-weldable textile material that comprise two unattached flaps arranged longitudinally with respect to their weld line, which can be used, as will be explained in more detail later, to attach the zip to the impermeable

layer and to cover, with a reliable sealing action, the area of the seams made in attaching the fabric layer.

The subject of the present invention is thus a method of sealing the join between the two tapes to which the teeth of a waterproof zip are attached and two edges of a garment as described in the appended Claim 1.

The present invention also relates to an assembly of components connected together in such a way as to enable the said method to be carried out.

A more detailed description of the method of the invention and of the said assembly of components connected together in such a way as to carry it out will now be given.

The abovementioned description will refer to the accompanying drawings, which show:

- in Fig. 1 a cross section through a waterproof zip with the two rows of teeth not connected, in which the method of the invention is being carried out, the strips of heat-weldable textile material not yet having been welded to their tapes in such a way as to cover the area of the seam of the lining;
- in Fig. 2 a perspective view of the same zip as in Fig. 1;
- in Fig. 3 a perspective view of the same zip as in the previous figures with the strips of heat-weldable textile material welded to their tapes and with the two rows of teeth of the zips connected together;
- in Fig. 4 the same view as in Fig. 1 but with the garment edges folded differently; and
- in Fig. 5 the same view as in Fig. 1 with the two layers of the garment in the reverse relative arrangement.

Referring to Figs. 1 and 2, these show a waterproof zip 1 in the course of the method of the invention for sealing its join: the said zip 1, in accordance with known principles, consists of two rows of teeth 4, 5 attached to two tapes 2, 3, e.g. of plastic, whose job it is to join together two edges of garment (not shown in its entirety). In the present case the garment is composed of a waterproof outer layer 7, which may likewise be made of plastic, and a textile lining 8 covering the inside.

Applied to the outside 2e, 3e of each of the said tapes 2,3 is a strip 9 of heat-weldable textile material. It is attached by at least one weld line L formed along a longitudinal line parallel to the rows of teeth 4, 5 in such a way that the strip 9 comprises a first unattached flap 9f and a second unattached flap 9s, one on each side of the said weld line L.

The said waterproof outer layer 7 is attached, also by welding, to the outer face of the flap 9s furthest from the teeth 4, 5, while the lining 8 is attached by means of a seam K to the inside of the respective tape 2, 3. It follows that all the stitches of the seam K lie in an area Z situated between the said weld line L and the associated row of teeth 4, 5.

At this point (see also Fig. 3) the flap 9f of each strip 9 situated closest to the teeth 4, 5 is folded down (arrows A) parallel against the outside of the respective tape 2, 3, entirely covering the said area Z of the seam K.

Another weld line N is then produced in such a way that each flap 9f situated nearest the teeth 4, 5 has the outline of its outer edges hermetically joined to the respective tape 2, 3, which in the example in question is made of plastic, thereby surrounding the abovementioned area Z.

The result of this is that all the stitches of the seam K of the said area Z between the said flap 9f and the respective tape 2, 3 are hermetically closed, preventing any infiltration of water through the said stitches.

In the figures considered thus far both the waterproof outer layer 7 and the lining 8 are directed, at points where they are attached to other parts, towards the teeth 4, 5 of the zip 1, but they can also be folded, forming a roll as indicated in Fig. 4, so as to be directed in the opposite direction. For aesthetic and functional reasons this is generally the most common form.

Figure 5 shows the same process being applied to a waterproof zip 1 identical to that described above, with the only difference that the waterproof layer 8 is situated on the inside of the garment and the fabric layer 7 on the outside. All the considerations made in relation to the previous case also apply here.

Both the abovementioned seam K and the said welds are produced by known systems and principles. In particular all the welds referred to can be produced by hot air jet, by high-frequency thermal induction processes, by chemical welding or by other methods producing a similar effect. Clearly, the materials that form the outer layer 7 and the tapes 2, 3 must be chosen to be compatible for the desired type of welding.

Claims

1. Method of sealing the join between the two tapes (2, 3) to which the teeth (4, 5) of a waterproof zip (1) are attached and two edges of a garment composed of a first or waterproof layer (7) and a second or fabric layer (8), these layers being superimposed on each other, which method is characterized in that it comprises the following steps:

a) applying, to a first side (2e, 3e) of each of the said two tapes (2, 3), a strip (9) of heat-weldable textile material attached to it by at least one weld line (L) formed along a longitudinal line, in such a way that each strip (9) comprises a first unattached flap (9f) and a second unattached flap (9s), one on each side of the said weld line (L) and both parallel to the lines of teeth (4, 5) of the zip (1);

b) welding the edge of the said first or waterproof layer (7) to one face of the flap (9s) furthest from the teeth (4, 5) of the zip (1);

c) attaching the edge of the said second layer (8) to the second side (2i, 3i) of each of the said tapes (2, 3) by means of a seam (K) in an area (Z) situated between the said weld line (L) and the zip (6);

d) folding down the flap (9f) nearest to the teeth (4, 5) of the zip (1) so that it lies parallel against the said first side (2e, 3e) of the corresponding tape (2, 3) and entirely covers the said area (Z); and

e) forming another weld (N) that hermetically joins the outline of the outer edges of the flap (9f) to the corresponding tape (2, 3) around the said area (Z).

2. Method according to Claim 1, in the case in which the said garment is composed of an impermeable outer layer (7) and a fabric lining (8), these two being

superimposed on each other, which method is characterized in that it comprises the following steps:

a) applying, to the outside (2e, 3e) of each of the said two tapes (2, 3), a strip (9) of heat-weldable textile material attached to it by at least one weld line (L) formed along a longitudinal line, in such a way that each strip (9) comprises a first unattached flap (9f) and a second unattached flap (9s), one on each side of the said weld line (L) and both parallel to the lines of teeth (4, 5) of the zip (1);

b) welding the edge of the said waterproof outer layer (7) to one face of the flap (9s) furthest from the teeth (4, 5) of the zip (1);

c) attaching the edge of the said lining (8) to the inside (2i, 3i) of each of the said tapes (2, 3) by means of a seam (K) in an area (Z) situated between the said weld line (L) and the zip (6);

d) folding down the flap (9f) nearest to the teeth (4, 5) of the zip (1) so that it lies parallel against the said outside (2e, 3e) of the corresponding tape (2, 3) and entirely covers the said area (Z); and

e) forming another weld (N) that hermetically joins the outline of the outer edges of the flap (9f) to the corresponding tape (2, 3) around the said area (Z).

3. Method according to one of the previous claims, in which the said welds are heat welds.

4. Method according to either of Claims 1 and 2, in which the said welds are chemical welds.

5. Assembly of waterproof zip (1) and tapes (2, 3) to which its teeth (4, 5) are attached, characterized in that there is welded, to a first side (2e, 3e) of each tape (2, 3) along a longitudinal weld line (L), a strip (9) of heat-weldable textile material which, after

being welded, has a first unattached flap (9f) and a second unattached flap (9s) extending longitudinally on each side of the abovementioned weld line (L) and parallel with respect to the lines of the said teeth (4, 5).

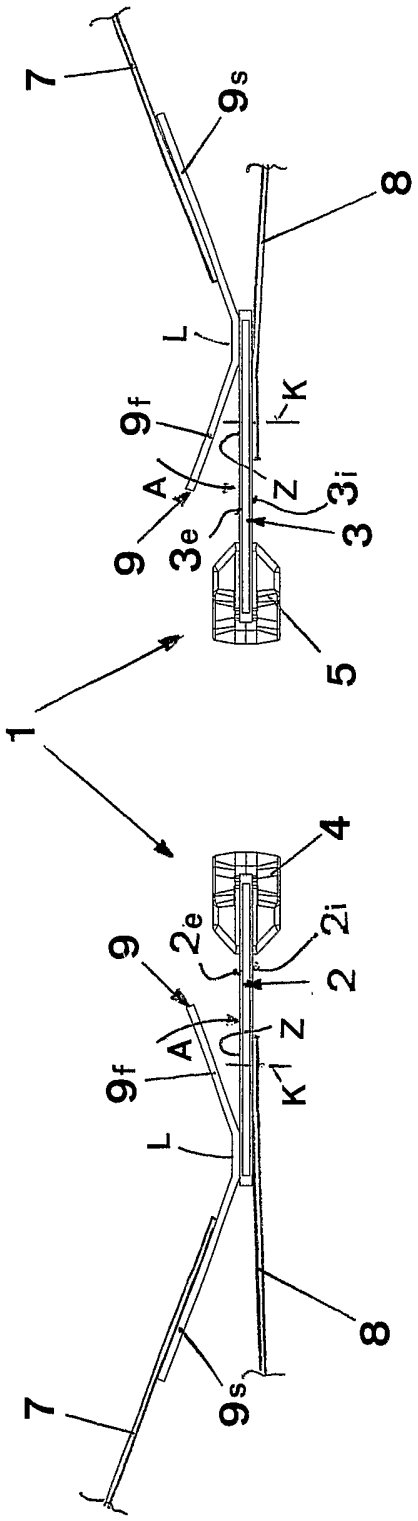


FIG. 1

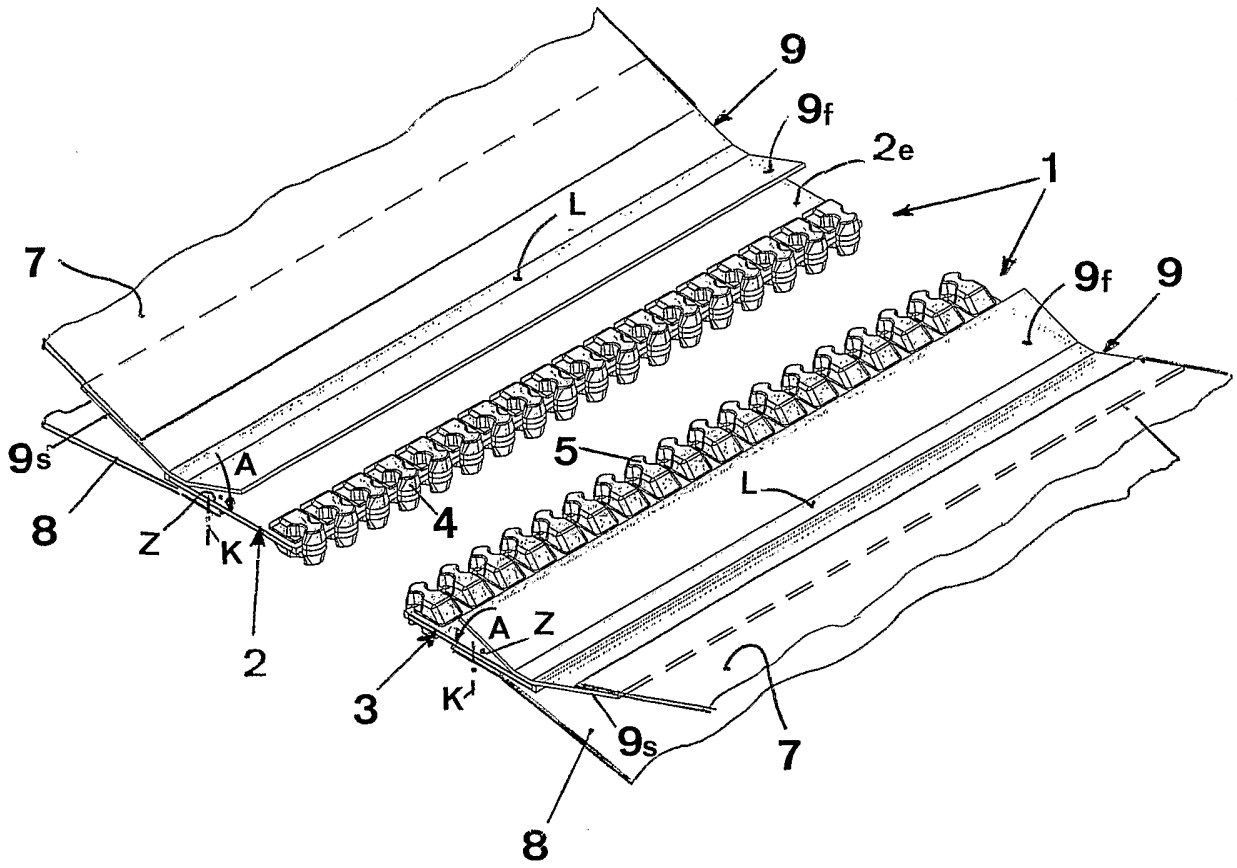


FIG. 2

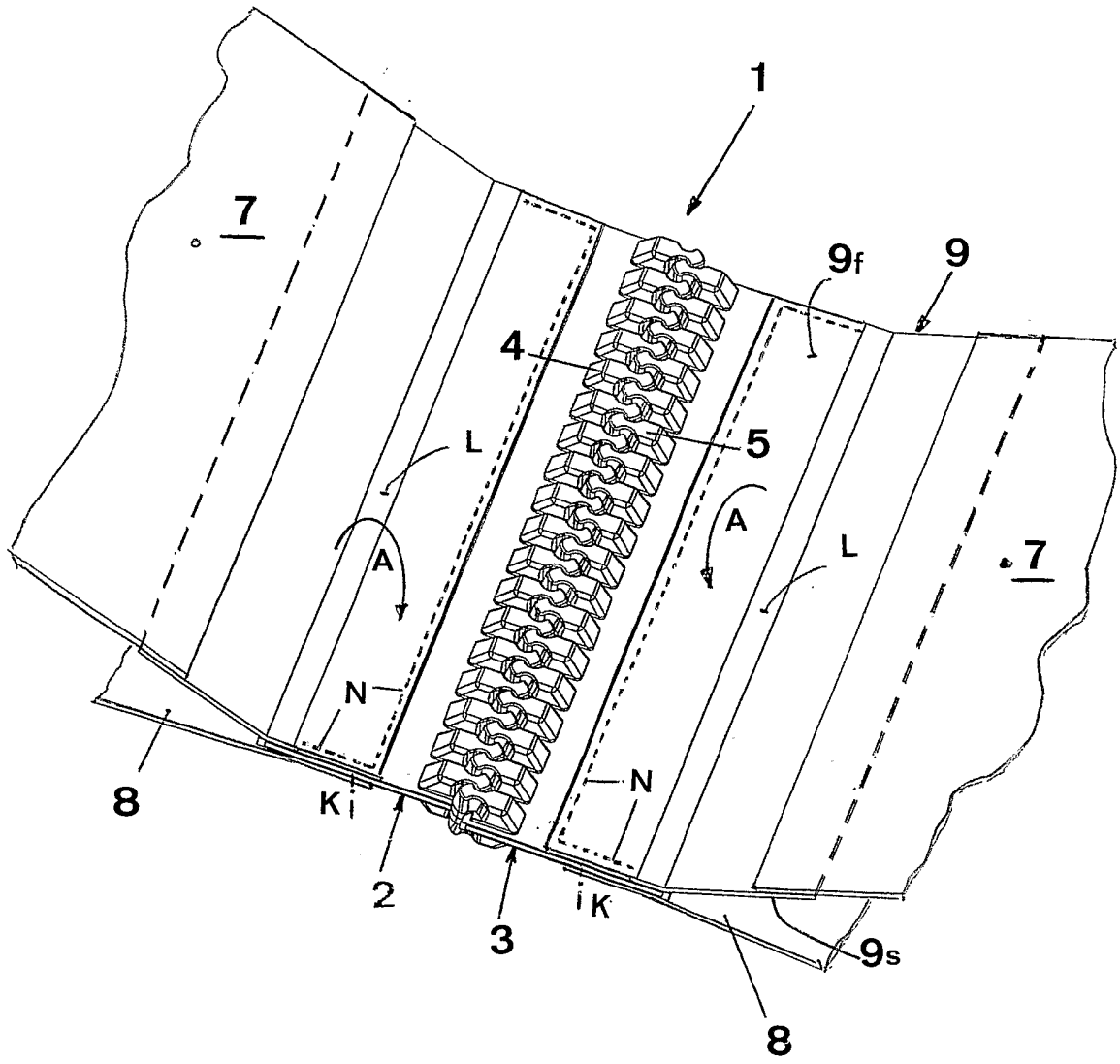


FIG. 3

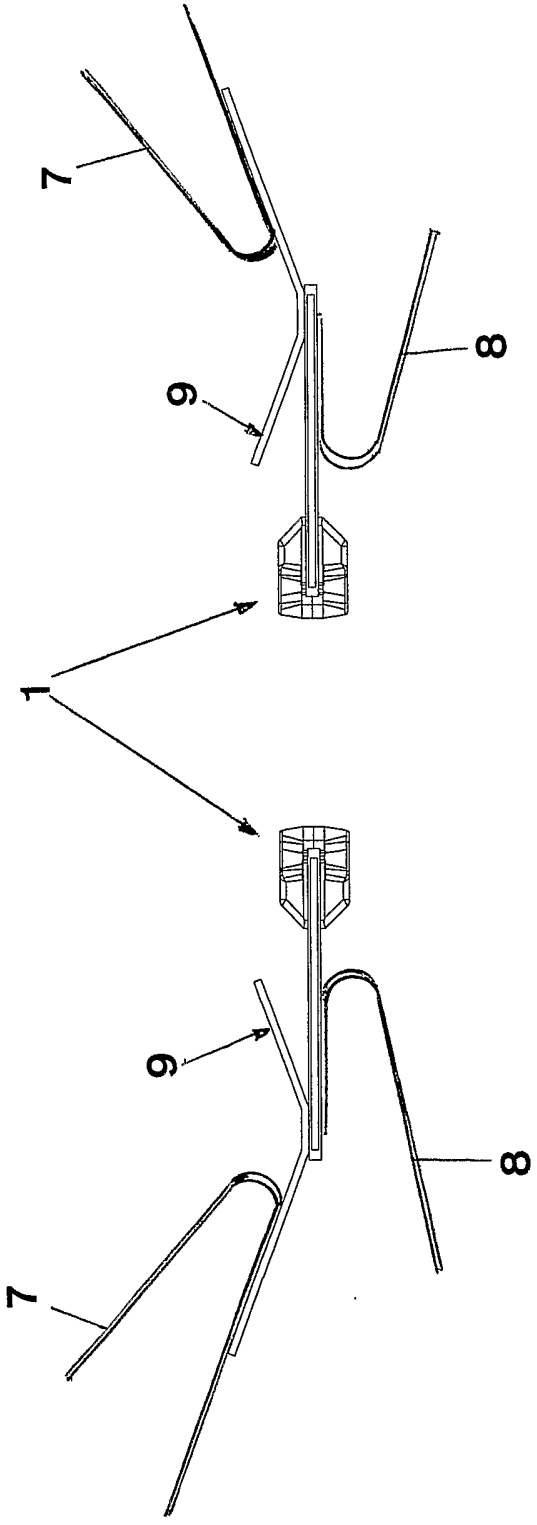
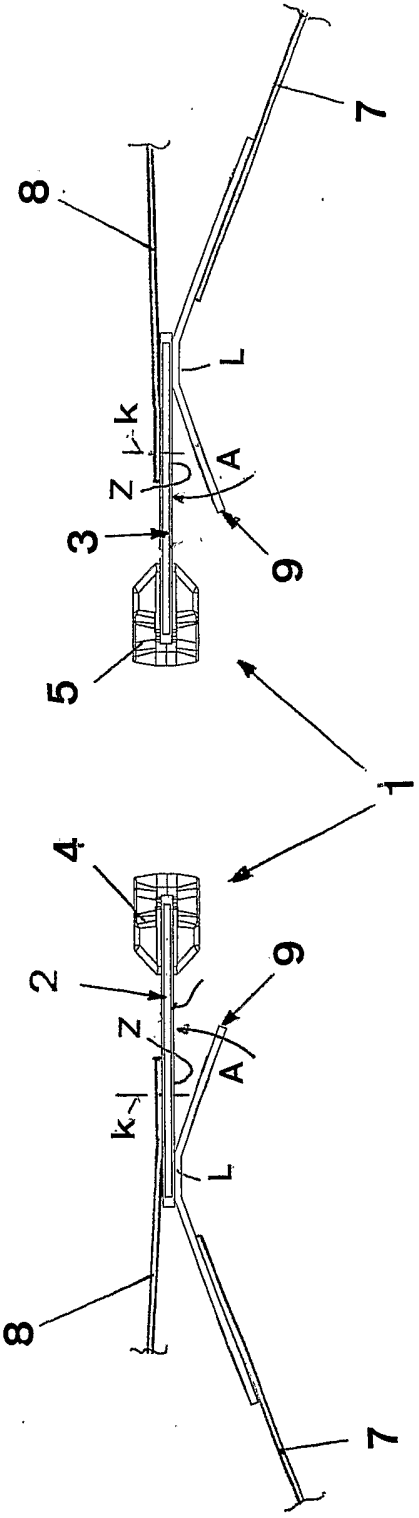


FIG.4

FIG.5



INTERNATIONAL SEARCH REPORT

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PCT/IB 03/01419

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A44B19/32 A41H37/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A44B A41H A41D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 42 12 209 A (R. MEIER) 14 October 1993 (1993-10-14) column 3, line 13 -column 5, paragraph 1; claims 1,12; figures 1-4	1
A	DE 39 33 019 A (H. KROYER) 11 April 1991 (1991-04-11) column 3, line 27 -column 4, line 49; claims 1,11; figure 1	1
A	US 5 159 719 A (W. L. GORE & ASSOCIATES INC.) 3 November 1992 (1992-11-03) column 5, paragraph 2 -column 7, paragraph 1; claim 1; figure 2	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA	Authorized officer
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INTERNATIONAL SEARCH REPORT

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