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(54) Title: METHOD OF MANUFACTURING HOOK AND LOOP FASTENER STRIP, DEVICE THEREFORE AND HOOK AND LOOP FASTENER STRIP

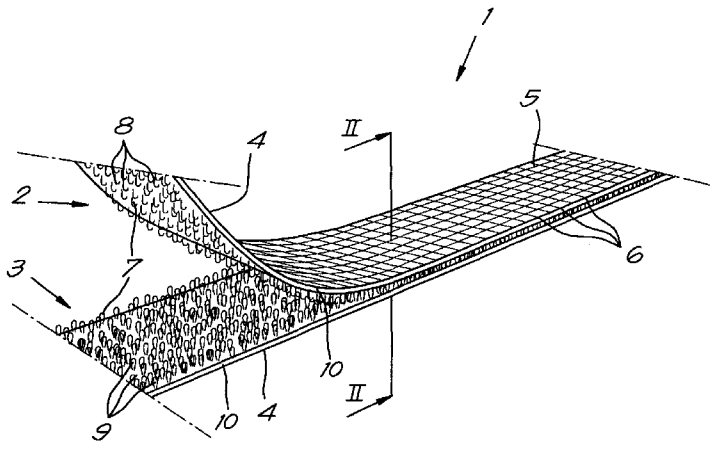

Fig. 1

(57) Abstract: Method for the production of at least one strip of male or female touch and close fastener (2,3) respectively, consisting of at least a support (4) with hooks (8) or loops (9) respectively on at least one side of it, in which a part of the strip does not have hooks (8) or loops (9), characterised in that the hooks (8) or loops (9) are selectively mechanically removed from a part of the touch and close fastener strip (2,3).

WO 2012/031339 A1

METHOD OF MANUFACTURING HOOK AND LOOP FASTENER STRIP, DEVICE THEREFORE AND HOOK AND LOOP FASTENER STRIP

The present invention relates to a method for the production of touch and close fastener strips in which not all of the surface is covered by hooks or loops, a device for implementing this method and touch and close fasteners with improved properties.

A touch and close fastener generally consists of two parts that can attach to one another, whereby one part is a male part that has small hooks protruding out of the support on at least one side, while the other part is a female part that has loops on at least one side.

When the male and female parts are brought together the small hooks latch onto the loops such that the parts fasten together.

Both parts primarily consist of a support and hooks or loops, for example formed by a matrix of warp threads and weft threads, between which pile threads are woven to form the pile protruding out of the support that forms the aforementioned hooks or loops.

A touch and close fastener strip often has edges, called sewing edges, on which there are no hooks or loops. This sewing edge can be used to sew the strip onto textiles.

Traditionally such a touch and close fastener strip is produced with sewing edges by setting up a loom such that the desired width of the strip, and also the desired width of the part that has the pile, is obtained.

Touch and close fasteners can also be made with different fastening strengths by varying the quantity of pile thread that is woven in, and also by selecting the right settings for the loom.

This traditional way of making touch and close fasteners with different widths and fastening strengths has a number of disadvantages.

A first disadvantage relates to the fact that in practice a large quantity of different qualities and widths have to be produced, for which the loom has to be adapted each time, which is a long and expensive operation.

There is also the disadvantage that if an electrical or mechanical fault occurs in a loom set for a certain type and a certain width, the production of this type and this width of touch and close fastener has to stop, and cannot easily be restarted on a different loom.

Another disadvantage is that a large stock, i.e. many different qualities and widths, has to be kept.

A further disadvantage is that there is no flexibility for adapting the touch and close fastener strip once it has been produced.

A method is known from US 4662037 for providing a touch and close fastener strip with a sewing edge by ultrasonically melting the hooks and loops over a part of the touch and close fastener, i.e. the part that will form the sewing edge.

This method indeed provides a partial solution to the said disadvantages, but it also has its own disadvantages.

For example, the molten material gets onto the support in a molten state, and is partly absorbed in it.

A sewing edge is thereby visually formed, but it partly consists of a hard solidified layer of what was previously the hooks or loops.

As a result the sewing edge is hard and the sewing of this sewing edge is hampered because the needle used cannot penetrate the sewing edge, or can only do so with difficulty.

As a result the sewing edge also loses the flexibility that the support normally has, such that it breaks or tears more easily.

With this method an economically attractive production speed, minimum 15 m/min, in practice rather 20 m/min or more, is not possible because in practice the hooks, which are relatively thick compared to the loops, do not melt completely and do not lie flat on or in the support, but

only partially melt and thereby form lumps on the sewing edge.

This gives an unattractive visual image, feels unattractive, and makes sewing more difficult.

An ultrasonic melting device is also relatively expensive, both with regard to procurement and usage, due to a relatively short lifetime.

Extensive readjustment of the ultrasonic device is also needed when a different type or different quality of touch and close fastener has to be provided with sewing edges in this way, such that there are significant adjustment costs when production changes.

A further disadvantage is that such a method is only feasible with a limited quantity of manufacturing materials for touch and close fastener.

Indeed, for the feasibility of the method it is first necessary for the material for the hooks and loops to be meltable. As a result materials that do not melt, but which harden or char, cannot be used at all. Metal threads, that melt at a very high temperature, cannot be used either.

Secondly it is necessary for the hooks and loops to melt at a temperature at which the support is not affected, which is a further limitation of the known method.

Touch and close fasteners with a lamination layer or backing, for example hot-melt adhesive, cannot be used, or only with difficulty, with this known method for providing sewing edges, because this lamination layer could also be affected by the heat for the melting.

The purpose of the present invention is to provide a solution to at least one or more of the aforementioned disadvantages and/or other disadvantages.

To this end the invention concerns a method for the production of at least one strip of a male or female touch and close fastener respectively, consisting of at least a support with hooks or loops respectively on at least one side of it, in which a part of the strip does not have hooks or loops, in which the hooks or loops are selectively mechanically removed from a part of the touch and close fastener strip.

The advantage of this is that a great variety of different touch and close fasteners, such as touch and close fasteners with logos or geometric decorations, touch and close fasteners of different widths and sewing edge widths, touch and close fasteners with reduced fastening strength, can be made from a wide touch and close fastener strip according to need and flexibly by selectively mechanically removing the hooks or loops.

In practice this will primarily be by cutting or shaving off the hooks and loops.

This can all be realised cheaply because little or no adjustment work of the loom is required, and it can thus be done at a high speed of 15 metres per minute, or preferably even 20 metres or more per minute.

Because all looms are set up in the same way, the uniformity of the touch and close fastener obtained is greater than with the traditional method.

A number of narrower touch and close fastener strips with sewing edges can also be made in an advantageous way from an initial wide touch and close fastener strip, produced on one loom for example.

The advantage of this is that a far less extensive stock of qualities and widths is needed, because it can be produced quickly, easily and flexibly.

A further advantage is that it brings about a capacity increase in a production department.

An advantage is also that the separation between the sewing edges and the fastening part of the strip can be applied more accurately than with the traditional method, whereby a more beautiful visual effect is obtained, certainly after the touch and close fastener has been used a few times.

Greater accuracy is also possible with respect to the width of the touch and close fastener strip and the sewing edge. In a traditional production process by weaving, an accuracy

of +/- 1.5 mm is possible for a 50 mm wide touch and close fastener strip, while with the method according to the invention an accuracy of +/- 0.1 mm is possible.

If a laminated touch and close fastener is made, i.e. a touch and close fastener with a self-adhesive or reactivatable adhesive backing, a textile backing, a flame-retardant layer or another backing, a perfectly fitting lamination layer is possible thanks to the method according to the invention, such that there is a lamination layer over the entire surface of the touch and close fastener strip, and does not protrude outside the touch and close fastener strip. There are also no limitations on the choice of material for the lamination layer, as is the case with the known method.

A further advantage is that the fastening strength of the touch and close fastener can be easily adjusted by removing the hooks or loops over a part of the surface of the touch and close fastener, such that the flexibility for making different qualities is increased.

The invention also concerns male or female touch and close fasteners consisting of at least a support and hooks or loops respectively, a part of which does not have hooks or loops, in which the support of that part has residues of the material that make up the hooks or loops, from which the hooks or loops have been mechanically removed.

The invention also concerns a device for producing at least one touch and close fastener strip, with at least a support

and hooks or loops, in which at least one part extending in the longitudinal direction does not have hooks or loops, that has means of mechanical removal in order to remove hooks or loops from a touch and close fastener strip, and transport facilities to move the means and the touch and close fastener with respect to one another in the longitudinal direction of the touch and close fastener.

The advantage of this is that a wide touch and close fastener strip can be easily converted into a series of smaller touch and close fastener strips with their sewing edges connected together, that only need to be separated from one another in order to be used.

With the intention of better showing the characteristics of the invention, a preferred embodiment of a method for making narrow touch and close fastener strips with sewing edges from a wide touch and close fastener strip according to the invention is described hereinafter by way of an example without any limiting nature, with reference to the accompanying drawings, wherein:

figure 1 schematically shows in perspective a touch and close fastener according to the invention with a male part with hooks and a female part with loops;

figure 2 shows a cross-section of a male touch and close fastener strip;

figure 3 schematically shows, in the direction of arrow F3 in figure 2, the method for producing narrow touch and close fastener strips with a sewing edge from a wide touch and close fastener strip;

figures 4 and 5 show cross-sections through the touch and close fastener in various phases of its processing, as indicated in figure 3 by lines IV-IV and V-V.

A touch and close fastener 1 shown in figure 1 is formed by two touch and close fastener strips, respectively a male touch and close fastener strip 2 and a female touch and close fastener strip 3, that are brought together to latch onto one another.

The touch and close fastener strips 2,3 are primarily formed from a support 4, in this example consisting of a matrix of warp threads 5 and weft threads 6 woven together, between which pile threads 7 are woven to form a pile in the form of hooks 8 for the male touch and close fastener 2 or in the form of loops 9 for the female touch and close fastener 3. This is shown in figure 2 with regard to the male touch and close fastener 2.

In the example shown, the hooks 8 and loops 9 are on one side of the support 4 and protrude with respect to this side, although it is not ruled out that both sides of the support 4 have such hooks 8 or loops 9.

In this example, the touch and close fastener strips 2,3 have sewing edges 10 where there are no hooks 8 or loops 9. In the traditional way these sewing edges 10 are formed by not weaving in any pile thread 7 in these places and they have a width A.

In figures 2 to 5, only a male touch and close fastener 2 is shown, and only the processing on a male touch and close fastener 2 is discussed, but the argument and drawings are analogously applicable to female touch and close fastener 3.

A method according to the invention, as shown in figure 3, uses a touch and close fastener strip 2 as an initial material, as shown in figure 2.

This touch and close fastener strip 2 is directed through a device 11 according to the invention in the direction of arrow P that consists of a rotating disk 13 with a shaving effect and a thickness B, corresponding to twice the desired sewing edge width A, which is mounted on a shaft 12, whereby the touch and close fastener 2 is directed against the disk 13 in such a way that the hooks 8 are removed together with a large part of their accompanying pile 7 by the action of the disk 13, while the support 4 does not contact the disk 13 in such a way that the support is not damaged.

As a result a straight track 14 is formed on the touch and close fastener strip 2 from which the hooks 8 are fully removed and the pile 7 is partially removed. At the location of this track 14, residues 15 of the pile thread remain in the support 4. Preferably, for visual reasons, the pile 7 is removed down to the support 4, so that there are no protruding parts. This is shown in figure 4.

This intermediary product can also be considered as two touch and close fastener strips 16, 17 that are connected together by their sewing edges 18.

Then the track 14 is split in the longitudinal direction, in this case by a rotating cutting blade 20 on a shaft 19. As a result, two touch and close fastener strips 16, 17 are produced, both with a sewing edge 18, as shown in figure 5.

If a different width other than A of the sewing edge 18 is desired, this can be easily done by adjusting the width B of the disk 13 and/or by cutting the track 14 asymmetrically.

As an option, the touch and close fastener 2,3 to which the method is applied can have a backing, for example a self-adhesive or reactivatable adhesive backing, a textile backing, a flame retardant layer or another layer whereby the touch and close fastener strips 16, 17 and the backing produced perfectly fit one another, and without the method having negative effects on the backing.

The method according to the invention, as described, can of course also be implemented a number of times, whereby the strips 16 or 17 serve as an initial product once again.

The method according to the invention can also be applied with a number of disks 13 to remove hooks 8 or loops 9 next to one another so that three or more touch and close fastener strips 16, 17 are formed.

The method according to the invention can also be implemented in a way such that not all, or even none, of the tracks 14 formed are split. This can be useful when applying the sewing edges 18 to the touch and close fastener 2,3 that has the desired width but does not have sewing edges, or for removing part of the hooks 8 or loops 9 from a touch and close fastener strip 2,3 in order to obtain a touch and close fastener strip 2,3 with the appropriate fastening strength.

Instead of removing the hooks 8 by shaving, various other mechanical methods can be used to remove the hooks 8 and the pile thread 7 or part of it.

The method for splitting the track 14 can also be done in in many ways, such as cold cutting, hot cutting, melting or burning, for example by using a cold or hot knife, ultrasonic or laser technology.

The invention is applicable to traditional hook-and-loop type touch and close fasteners, but also to other types of touch and close fasteners, such as mushroom touch and close fasteners, velours touch and close fasteners and extruded touch and close fasteners.

The present invention is by no means limited to the embodiments described as an example and shown in the drawings, but a method, touch and close fasteners and a device according to the invention can be realised in all kinds of variants, forms and dimensions, without departing from the scope of the invention.

Claims.

1.- Method for the production of at least one strip of male or female touch and close fastener (2,3) respectively, consisting of at least a support (4) with hooks (8) or loops (9) respectively on at least one side of it, in which a part of the strip does not have hooks (8) or loops (9), characterised in that the hooks (8) or loops (9) are selectively mechanically removed from a part of the touch and close fastener strip (2,3).

2.- Method according to claims 1, characterised in that the hooks (8) and or loops (9), together with the pile thread (7) from which they are formed, are removed down to close to the support (4).

3.- Method according to claim 1 or 2, characterised in that the touch and close fastener (2,3) consists of a woven or knitted support (4) and that the hooks (8) or loops (9) are formed by pile threads (7) incorporated into this support (4).

4.- Method according to any one of the previous claims, characterised in that it is applied to the strip in the longitudinal direction, and that at least a part of the surface from which the hooks (8) or loops (9) are removed forms a sewing edge (18).

5.- Method according to any one of the previous claims, characterised in that at least two strips of a touch and

close fastener (16, 17) are produced that are next to one another in the longitudinal direction, and which are each connected by a sewing edge (18) to a sewing edge (18)of adjacent strips (16, 17).

6.- Method according to claim 4 or 5, characterised in that supplementary, touch and close fastener strips (16, 17) are separated from one another by severing the connection between the sewing edges (18).

7.- Method according to any one of the previous claims, characterised in that the method is used for producing touch and close fastener (2, 3) with a reduced fastening strength.

8.- Method according to any one of the previous claims, characterised in that the support (4) of the touch and close fastener strip (2,3) has a backing on the side where there are no hooks (8) or loops (9).

9.- Male or female touch and close fastener (2,3) consisting of at least a support (4) and hooks (8) or loops (9) respectively, a part (18) of which does not have hooks (8) or loops (9), characterised in that the support (4) of that part (18) has residues (15) of the material (7) that forms the hooks (8) or loops (9), from which the hooks (8) or loops (9) have been mechanically removed.

10.- Device (11) for producing at least one touch and close fastener strip (16, 17) with at least a support (4) and

hooks (8) or loops (9), of which at least one part (18) extending in the longitudinal direction does not have hooks (8) or loops (9), characterised in that it has mechanical removal means (13) to remove hooks or loops from a touch and close fastener strip (2,3) and transport facilities to move these means (13) and the touch and close fastener (2,3) with respect to one another in the longitudinal direction of the touch and close fastener (2,3).

11.- Device according to claim 10, characterised in that the mechanical removal means consist of a rotating disk (13) with a shaving or cutting effect.

12.- Device according to claim 10 or 11 characterised in that it is intended for the production of at least two touch and close fastener strips (16,17), and additionally has means (20) to separate the touch and close fastener strips (16,17) from one another at the location of the removed hooks (8) or loops (9).

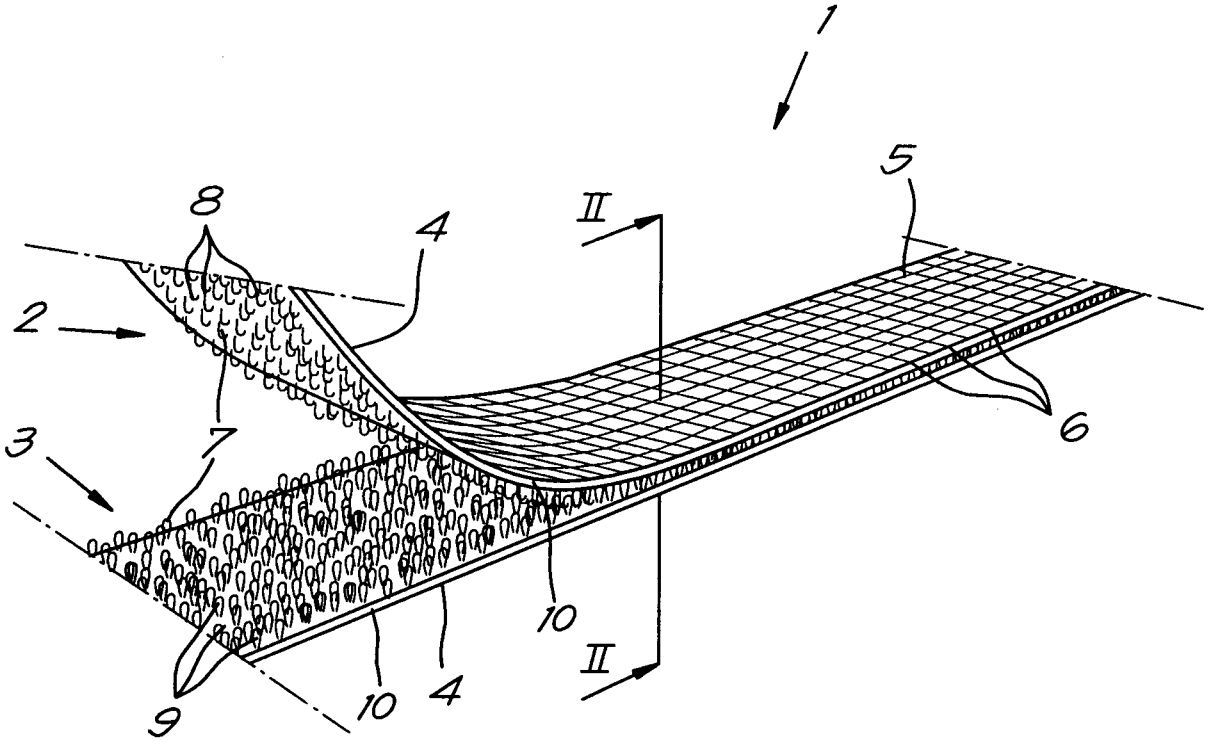

Fig.1

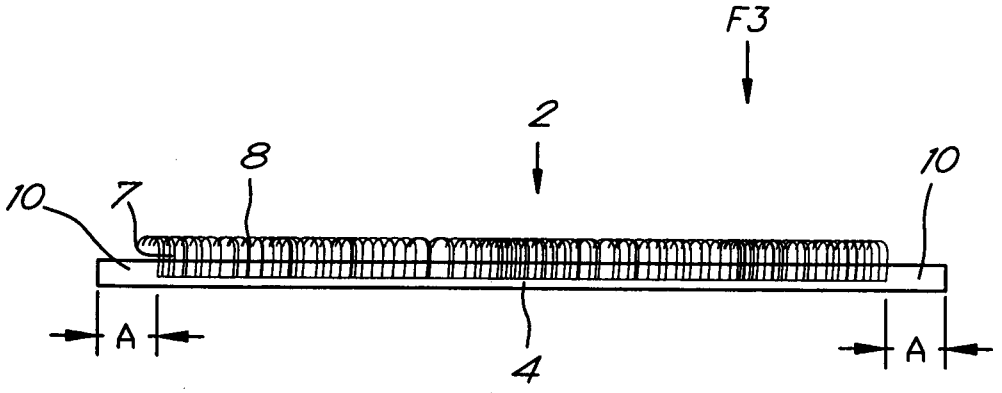

Fig.2

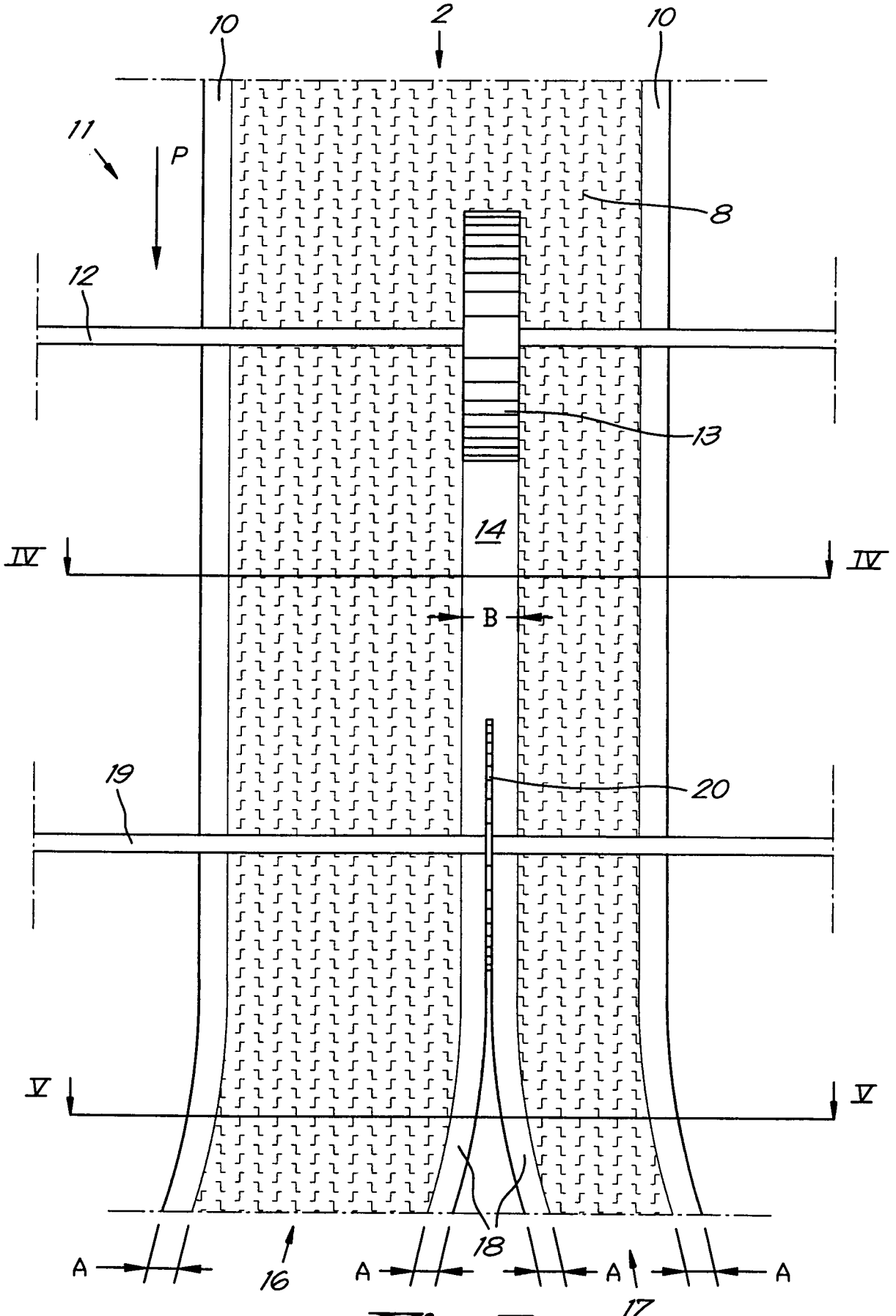

Fig.3

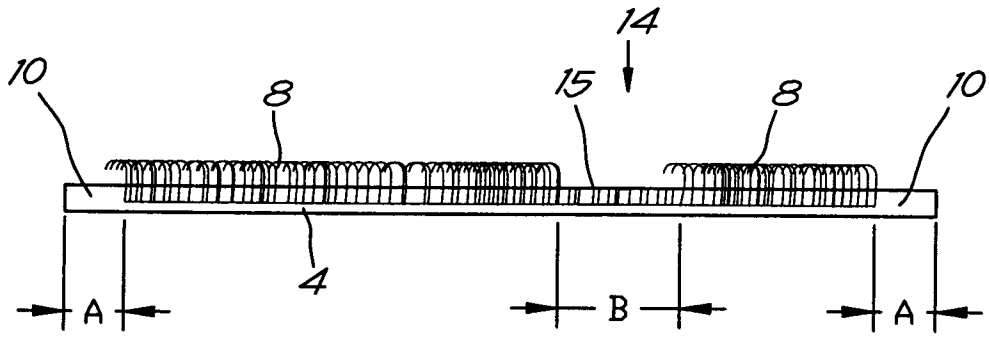

Fig.4

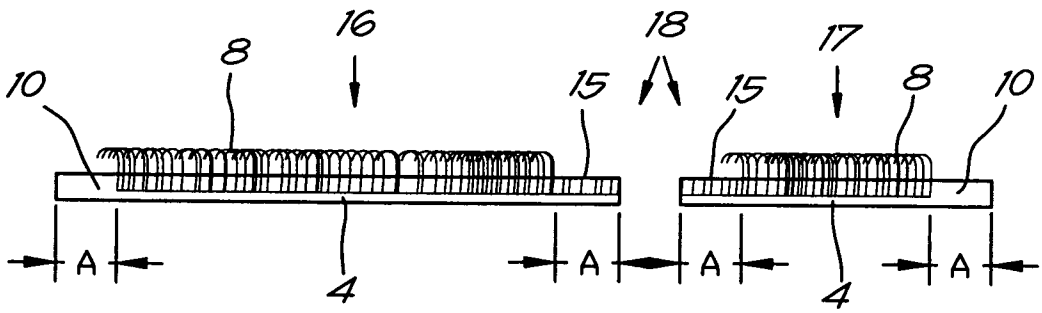

Fig.5

INTERNATIONAL SEARCH REPORT

International application No
PCT/BE2011/000050

A. CLASSIFICATION OF SUBJECT MATTER
INV. A44B18/00
ADD.

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)
A44B

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 662 037 A (G.A. PROVOST ET AL) 5 May 1987 (1987-05-05) cited in the application	1-7,9, 10,12
Y	column 3, line 42 - column 6, line 49 -----	8
Y	US 4 646 397 A (H. YOSHIDA) 3 March 1987 (1987-03-03)	8
A	column 2, line 22 - line 62 -----	1,9,10

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

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Date of the actual completion of the international search	Date of mailing of the international search report
14 December 2011	23/12/2011

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/BE2011/000050

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4662037 A	05-05-1987	NONE	
US 4646397 A	03-03-1987	GB 2160586 A	24-12-1985
		HK 40589 A	26-05-1989
		IT 1215161 B	31-01-1990
		JP 61007310 U	17-01-1986
		JP 63026014 Y2	15-07-1988
		KR 870000067 Y1	07-02-1987
		SG 24789 G	14-07-1989
		US 4646397 A	03-03-1987