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(71) Applicant (for all designated States except US): **SCA HYGIENE PRODUCTS AB** [SE/SE]; S-405 03 Göteborg (SE).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **VARTIAINEN, Kent** [SE/SE]; Södra Långvägen 49, S-443 38 Lerum (SE).

(74) Agent: **ALBIHNS GÖTEBORG AB**; Box 142, S-402 21 Göteborg (SE).

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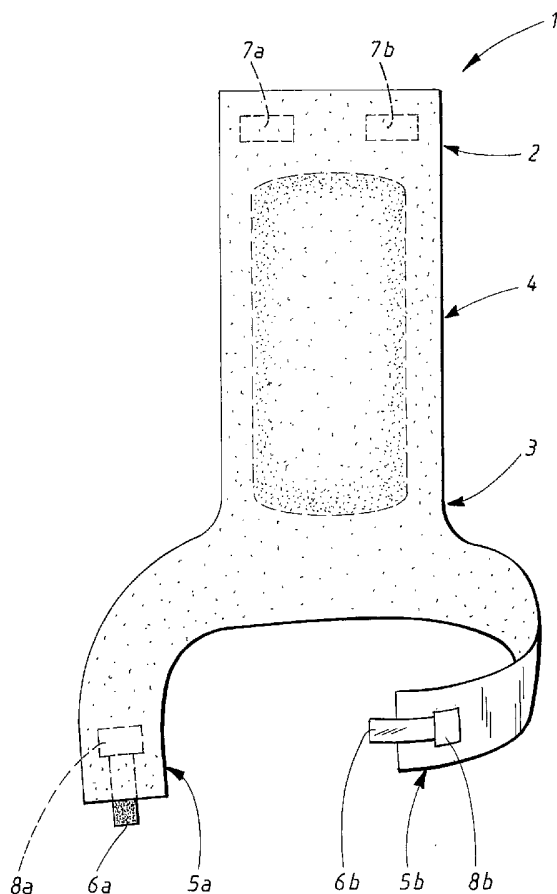
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(54) Title: **ABSORBENT ARTICLE**



(57) Abstract: The invention relates to an absorbent article comprising a front portion, a rear portion and a crotch portion there between, a pair of belt portions attached to the rear portion and which are fastenable together around a waist of a wearer, a pair of first fastener arrangement located on each of said pair of belt portions, and a pair of second fastener arrangement located on either side of said front portion connectable to said first fastener arrangement pair of belt portions, such that the article will assume a pant like shape, and that said pair of belt portions form a part of a waist portion of the article. The fastener arrangement facing the wearer having a surface that is provided with a deployable protective cover, which cover is deployable over the said surface when a pair of assembled first and second fastener arrangement are subjected to a force substantially in the direction of said surface in order to separate the assembled fastener arrangements. The invention further relates to a fastener assembly for attaching a first surface to a second surface.



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.

ABSORBENT ARTICLE

TECHNICAL FIELD

The present invention relates to an absorbent article such as a diaper and an
5 incontinence guard comprising a liquid permeable top sheet, a liquid
impermeable back sheet and an absorbent body enclosed there between,
wherein the article having a front portion, a rear portion and a crotch portion
there between, and further is provided with a pair of belt portions attached to
the rear portion, alternatively the front portion of the article and which are
10 intended to be fastened together around the waist of the wearer by means of
the first fastening means and where said front portion, alternatively the rear
portion, is provided with attachment means intended to be attached to the
belt portions, in such a way that the article will assume a pant like shape,
where the belt portions form a part of the waist portions of the pant.

15 BACKGROUND ART

Diapers and incontinence guards usually exhibit a garment portion holding an
absorbent body in place against the user's body and attachment means,
which hold the garment portion in place also when the user is moving. A
common type of attachment means are adhesive tapes or hook and loop
20 fasteners of the touch-and-close type, which directly attach the front and rear
portions of the absorbent article to each other. It is further known to attach
the front and rear portions of the article by means of a belt, wherein the
possibilities to adjust the fit are improved.

A conventional diaper for children is in general applied having the child in a
25 lying position. The attachment means are usually arranged on the rear
portion and are attached to the front portion. This kind of application often
requires the aid from another person. However, for an adult user it is more
desirable be able to self apply the incontinence guard. On a common type of

- belt diaper the belt portions are therefore first attached around the waist. When the incontinence guard is fixed around the waist in this way, the user may reach after the rest of the incontinence guard between the legs and then the crotch portion of the incontinence guard is applied in the correct position
- 5 by fastening the front portion of the diaper to the outside of the belt portions using hook and loop fasteners or tape tabs being arranged on the front portion and/or the belt portion. This design makes also possible for nursing personnel to apply the diaper on a standing person or for the user to apply the diaper on himself/herself in a standing position.
- 10 One problem relating to diapers and incontinence guards of these types is that the fastening arrangements may come into contact with or chafe the skin of a wearer. This is a particular problem when removing an incontinence guard from an adult wearer who is lying down. In such cases, the wearer is as a rule rolled over on his or her side, whereby the fastener arrangements
- 15 may be opened. The lower fastener arrangement is subsequently pulled clear from under the wearer. This means that the part of the fastener arrangement facing the wearer may cause chafing when pulled along the exposed skin.

Therefore there is a need for absorbent article provided with an arrangement for preventing the fastener means from chafing the wearer when the

20 absorbent article is removed.

DISCLOSURE OF INVENTION

The above problem is solved by means of an absorbent article as claimed in claim 1 and a fastener arrangement as claimed in claim 17.

- The object of the present invention is to provide an absorbent article, such as
- 25 a diaper or incontinence guard that facilitates removal from a wearer while said wearer is in a reclining or recumbent position. This object is achieved by providing fastener arrangements on said article with protective covers which are deployed during the process of separation and removal of the said fastener arrangements.

The invention is preferably, but not necessarily, aimed at absorbent articles of the above types being provided with at least two fastener arrangements. Said fastener arrangements may be attached on either side of the article, or in spaced apart pairs in order to connect the front or rear of the article.

- 5 The invention is preferably, but not necessarily, related to an absorbent article comprising a liquid permeable top sheet, a back sheet, and an absorbent body enclosed there between. The back sheet may be either liquid permeable or liquid impermeable. The absorbent article further comprises a front portion, a rear portion and a crotch portion there between, as well as a
- 10 pair of belt portions attached to the front or rear portion and which are fastenable together around a waist of a wearer. However, in the subsequent text the belt portions will be described as being attached to the rear portion. The belt portions may be either elastic or inelastic. In order to fasten the article around a waist of a wearer, the article may be provided with at least
- 15 one pair of fastener arrangements located on each of said pair of belt portions. A pair of first fastener arrangements is connectable to the front portion in such a way that the article will assume a pant like shape, and that said pair of belt portions form a part of a waist portion of the article.

- According to one alternative, the first fastener arrangements are connectable
- 20 directly to the outer surface of the back sheet of the front portion.

According to a further alternative, a pair of second fastener arrangements may be located on either side of said front portion. The second fastener arrangements are connectable to the first fastener arrangements pair of said belt portions.

- 25 The part of the fastener arrangements facing the wearer may have a surface that is provided with a deployable protective cover, which cover is deployable over the said surface when said at least one fastener arrangement is separated from the front portion and subjected to a force substantially in the direction of said surface in order to pull an associated belt portion or similar

under the wearer. This occurs when the article is to be removed from the wearer, whereby at least a belt portion is gripped and pulled in a direction substantially parallel to the general direction of the contacting surfaces of the first fastener arrangement and the front portion where they are in contact with
5 or shaped by the wearer.

The protective cover may be attached to the belt portion at one end and to the front portion at its opposite, second end when the fastener arrangements are connected to the front portion.

According to a first embodiment, the protective cover is fixedly attached to
10 the belt portion. In this case, the protective cover may be releasably attached to the front portion.

According to one alternative first embodiment, the protective cover is attached to the front portion by a releasable adhesive. The releasable adhesive is preferably, but not necessarily, a heat activated or pressure
15 sensitive adhesive. Adhesive compositions of this type may be tacky within a predetermined, first temperature range and will strongly bond an article to a substrate within a given, second temperature range, but may be substantially non-tacky at temperatures outside either range. According to one example, an adhesive composition may contain a polymeric pressure-sensitive
20 adhesive component and a crystalline polymer which defines a temperature range within which the composition as a whole is tacky.

Suitable compositions for such adhesive materials, as well as their softening and melting points are described in e.g. EP 571 548 B1, which is hereby incorporated by reference. The adhesive materials used in the embodiments
25 described below should preferably be non-tacky at ambient temperatures, to facilitate handling. It is of course possible to use other adhesive materials. However, if tacky or slightly tacky materials are used, a removable release paper or similar may be required.

According to a second alternative first embodiment, one end of the protective cover may be attached by means of a hook-and-loop type attachment means. This may be achieved by providing the end of the cover to be attached with a hook-type fastening material that can be attached directly
5 onto the surface of the outer back sheet of the front portion. The fibrous material in said back sheet will then act as a co-operating loop-type fastening material for the end of the protective cover.

According to a third alternative first embodiment, one end of the protective cover may cause the cover to deploy due to friction between the second end
10 of the protective cover and the front portion.

When the fastener arrangements are connected to the front portion, the attachment means for the protective cover, such as a releasable adhesive or a hook means, will cause the second end of the protective cover to attach itself to the front portion. When the fastener arrangements are to be
15 separated, a force is applied to release the first fastener arrangements from the front portion, as described above. As the belt portion begins to separate from the front portion, deployment of the protective cover is simultaneously initiated. When the fastener arrangements are completely separated, the protective cover is fully deployed as the belt portion is pulled free. The end of
20 the protective cover attached to the front portion will release, while the fastener arrangement on the belt portion remains protected by the cover as it is pulled from under the wearer.

According to a second embodiment, the protective cover is attachable to the belt portion at one end and releasably attached to the front portion at its
25 opposite end when the fastener arrangements are assembled. In this case the protective cover is attachable to the belt portion by a suitable adhesive. As stated above, the adhesive is preferably, but not necessarily, a heat activated or pressure sensitive adhesive.

According to a first alternative of the second embodiment, the second end of the protective cover is fixedly attached to the front portion, but is provided with a perforated frangible section that allows the protective cover to tear and be released from the second end and the front portion once it has been fully
5 deployed. This may be achieved by, for instance, by attaching a folded protective cover to the front portion at its first end, whereby is attached to the belt portion by means of an activatable adhesive at its first end after the fastener arrangement have been assembled. Suitable adhesives for this purpose may be heat activated or pressure sensitive adhesives of the type
10 described above.

When the fastener arrangements are connected to the front portion, the adhesive will cause the first end of the protective cover to attach itself to the belt portion. When the fastener arrangements are separated, the protective cover remains attached to the belt portion during the separation and will be
15 pulled out in front of the respective first fastener arrangement. Once the protective cover is fully deployed to cover the first fastener arrangement, the frangible section at the second end of the protective cover tears and releases the cover from the front portion.

According to a second alternative of the second embodiment, the protective
20 cover is attached to the front portion by means of a relatively weak, frangible connection or by friction. This may be achieved by, for instance, inserting a length of material underneath the fastener arrangement located on the front portion. By attaching said fastener arrangement to the absorbent article by means of a pair of parallel welds along the edges of said fastener, the
25 protective cover may be inserted between the parallel welds.

When the fastener arrangements are assembled, the releasable adhesive will cause the first end of the protective cover to attach itself to the belt portion. When the fastener arrangements are to be separated, the protective cover remains attached to the belt portion during the separation and will be pulled

out from under the second fastener arrangement to cover the first fastener arrangement.

In the above examples, the heat activated adhesive may be activated at a temperature exceeding, for instance, **28°C**. Alternatively, the heat activated
5 adhesive is activated at or near the body temperature of the wearer. When using a heat activated adhesive, the insulating properties of the absorbent article may influence the choice of adhesive. One requirement may be that the heat given off by the wearer must be sufficient to activate the adhesive. Further requirements may be that the adhesive should have properties which
10 ensures that the adhesive coated surface is not tacky at room temperature. This allows the fastener arrangement to be handled while preventing the adhesive from being activated before the fastener arrangements are assembled.

When fully deployed, the protective cover may preferably, but not
15 necessarily, have a length equal to or longer than the fastener arrangement to be covered. Similarly, the width may preferably, but not necessarily, be equal to or larger than the fastener arrangement to be covered. The said cover may be made from any suitable material, such as a suitable tissue, plastic film or a non-woven. The material should have a tear strength that is
20 sufficient to allow it to be deployed over the fastener arrangement and pulled underneath a wearer while in contact with the skin of said wearer without tearing.

The invention further relates to a fastener assembly for attaching a first surface to a second surface, which fastener assembly comprises a first
25 fastener arrangement located on said first surface, and a second fastener arrangement located on said second surface, and being connectable to said first fastener arrangement. The first fastener arrangement facing the second surface may have a surface that is provided with a deployable protective cover, which cover is deployable over the said surface when a pair of
30 assembled first and second fastener arrangement are subjected to a force

substantially in the direction of said surface in order to separate the assembled fastener arrangements. A fastener assembly of this type may be used not only for absorbent articles, such as a diapers or incontinence guards, but for all types of sanitary articles, single or assembled webs or
5 layered products and similar arrangements, which may be assembled during use and separated after use.

The first and second fastener arrangements are preferably, but not necessarily, provided with hook-and loop-type filamentary material. One example of such a material is manufactured under the name Velcro ®.
10 Alternatively, the first and second fastener arrangements may be provided with other types of fastener means, such as a pressure sensitive adhesive.

BRIEF DESCRIPTION OF DRAWINGS

In the following text, the invention will be described in detail with reference to
15 the attached drawings. These drawings are used for illustration only and do not in any way limit the scope of the invention. In the drawings:

Figure 1 shows a schematic drawing of an absorbent article provided with fastener arrangements according to the invention.

Figure 2A-D shows a fastener arrangement according to a first embodiment
20 of the invention.

Figure 3A-C shows a fastener arrangement according to a second embodiment of the invention.

Figure 4A-C shows a fastener arrangement according to a third embodiment of the invention.

25 Figure 5A-B shows a fastener arrangement according to a fourth embodiment of the invention.

EMBODIMENTS OF THE INVENTION

Figure 1 shows a schematic drawing of an absorbent article 1 provided with fastener arrangements according to the invention. The absorbent article 1 comprising a liquid permeable top sheet, a liquid impermeable back sheet, and an absorbent body enclosed (indicated with dashed lines) there between. These parts are standard components used in absorbent articles of this type and as such they will not be described in further detail. The absorbent article 1 further comprises a front portion 2, a rear portion 3 and a crotch portion 4 there between, as well as a pair of belt portions 5a, 5b attached to the rear portion 3 and which are fastenable together around a waist of a wearer. The belt portions may be either elastic or inelastic.

In order to fasten the article around a waist of a wearer, the article is provided with a pair of first fastener arrangements 6a, 6b located on each of said pair of belt portions 5a, 5b with a first end, or gripping tab, extending a short distance from the end of each belt portion 5a, 5b. A pair of second fastener arrangements 7a, 7b (indicated by dashed lines) located on either side of said front portion 2. The second fastener arrangements 7a, 7b are connectable to said first fastener arrangements 6a, 6b on the pair of belt portions 5a, 5b in such a way that the article will assume a pant like shape, and that said pair of belt portions form a part of a waist portion of the absorbent article 1. The first and second fastener arrangements 6a, 6b; 7a, 7b comprise a hook-and loop-type filamentary material. The first and second fastener arrangements comprise elongated strips of material extending in the general direction of the belt portions, when the belt portions are fastened around the wearer. The length of each such strip is selected with respect to the size of the absorbent article, while allowing for a limited amount of adjustment when attaching the fasteners around the wearer.

According to an alternative embodiment, the second fastener arrangements 7a, 7b are optional. By providing first fastener arrangements 6a, 6b with a hook-type material, it is possible to use the outer surface of the back-sheet

on the front portion as a co-operating loop-type material. The first fastener arrangements 6a, 6b can then be attached directly onto any desired position on the front portion of the absorbent article.

The fastener arrangements facing the wearer, in this case the first fastener arrangements 6a, 6b, have an upper surface that is provided with a deployable protective cover 8a, 8b. The said cover is attached adjacent the second, or inner end of each first fastener arrangement 6a, 6b. Each respective cover 8a, 8b is deployable over the said surface when a pair of assembled first and second fastener arrangements 6a, 6b; 7a, 7b is subjected to a force substantially parallel to the direction of said surface after separation of the assembled fastener arrangements. This occurs when the article is to be removed from the wearer. When the wearer is lying, for instance, on his/her side, a first belt portion is exposed and can be separated from the front portion. Subsequently, the second belt portion is gripped and pulled to separate it from the fastener arrangement from the front portion. The second belt must then be pulled underneath the wearer, whereby the deployed cover prevents the surface of the fastener arrangement, provided with hooks or loops, from contacting the skin of the wearer.

Figure 2A shows a fastener arrangement according to a first embodiment of the invention. In this and the subsequent figures the relative thicknesses of the component parts are not drawn to scale for reasons of clarity. In addition, the protective covers for the fastener arrangements described are provided on both sides of the article, although only one side is described in the examples below. In Figure 2A the belt portion 5a with its first fastener arrangement 6a is assembled with the front portion 2 and its second fastener arrangement 7a. A deployable cover 8a is permanently attached to the belt portion 5a at a first end 10 by means of a suitable adhesive. The cover 8a further comprises a strip 11 of material folded in a zig-zag configuration, which strip has a width and length exceeding the width and length of the first fastener arrangement 6a when deployed. In this example, the strip comprises

a plastic film having a thickness of 40 μm . At its opposite, second end 12 the surface of the cover 8a that is exposed to the front portion 2 is provided with an adhesive. This adhesive is heat activated and will attach the second end 12 of the strip 11 to the front portion 2 when exposed to the body temperature of the wearer over a period of time. In this case, the activation temperature of the heat activated adhesive used is selected in the range 28-37°C.

Figure 2B shows the assembled fastener arrangements as the first fastener arrangement 6a has been separated from the second fastener arrangement 7a and is being pulled in the direction A. The strip 11, being attached to the first belt portion 5a, is partially deployed over the exposed surface of the first fastener arrangement 6a facing the wearer (not shown). Figure 2C shows the strip 11 fully deployed over the first fastener arrangement 6a. When the strip 11 is extended to its full length, the adhesive coated surface of the second end 12 will peel away from the front portion 2. For this purpose, the bonding strength of the heat activated adhesive at the second end 12 must be lower than the corresponding strength of the permanent bond between the first end 10 and the belt portion 5a. The belt portion 5a can then be pulled under the recumbent wearer, allowing the absorbent article to be removed.

Figure 2D shows a fastener arrangement according to an alternative first embodiment of the invention. The fastener arrangement shown in this figure is substantially identical to that of Figure 2A, differing only in that the second fastener arrangement 7a is not present. According to this embodiment, the first fastener arrangement 6a is attached directly onto the outer surface 2' of the front portion 2. Consequently, the first fastener arrangement 6a must be separated from the front portion 2 before the cover 8a can be deployed. In all other respects, the function of the cover 8a is the same as described in relation to Figures 2A-2C.

Figure 3A shows a fastener arrangement according to a second embodiment of the invention. In this figure the belt portion 5a with its first fastener

arrangement 6a is assembled with the front portion 2 and its second fastener arrangement 7a. A deployable cover 8a is attached to the front portion 2 at a first end 13 by means of a suitable adhesive. The cover 8a further comprises a strip 14 of material folded in a zig-zag configuration and having a width and length exceeding the width and length of the first fastener arrangement 6a when deployed. At its opposite, second end 15 the surface of the cover 8a that is exposed to the belt portion 5a is provided with an adhesive. This adhesive is heat activated and will attach the second end 15 of the strip 14 to the belt portion 5a when exposed to the body temperature of the wearer over a period of time. As has been described in connection with Figures 2A and 2B above, the first fastener arrangement 6a must be separated from the second fastener arrangement 7a to allow the cover to be deployed and the absorbent article to be removed.

Figure 3B shows the strip 14 fully deployed over the first fastener arrangement 6a. When the strip 14 is extended to its full length, a perforated line 16 adjacent the adhesive coated first end 13 will tear and release the strip 14 from the front portion 2. For this purpose, the bonding strength of the heat activated adhesive at the second end 12 must be higher than the tear strength of the perforated line 16 adjacent the first end 13. The belt portion 5a can then be pulled under the recumbent wearer, allowing the absorbent article to be removed.

Alternatively, the first end 13 can be arranged to peel away from the front portion 2, similar to the first embodiment as shown in Figure 2C. In this case, the bonding strength of the heat activated adhesive at the second end 15 must be higher than the corresponding strength of the adhesive bond between the first end 13 and the front portion 2.

Figure 3C shows a fastener arrangement according to an alternative second embodiment of the invention. The fastener arrangement shown in this figure is substantially identical to that of Figure 3A, differing only in that the second fastener arrangement 7a is not present. According to this embodiment, the

first fastener arrangement 6a is attached directly onto the outer surface 2' of the front portion 2. Consequently, the first fastener arrangement 6a must be separated from the front portion 2 before the cover 8a can be deployed. In all other respects, the function of the cover 8a is the same as described in relation to Figure 3A and 3B.

Figure 4A shows a fastener arrangement according to a third embodiment of the invention. In this figure the belt portion 5a with its first fastener arrangement 6a is assembled with the front portion 2 and its second fastener arrangement 7a. The second fastener arrangement 7a is attached along its longitudinal side edges, as described in connection with Figure 4C below. A deployable cover 17 comprises an elongated strip 18 of material that has a first end located under the second fastener arrangement 7a, between the side edges thereof. The deployable cover 17 is retained on the front portion 2 by means of friction between the strip 18 and the second fastener arrangement 7a. If required, additional retaining means, such as a suitable adhesive, can be used to retain the cover 17 in position until its deployment. An opposite, second end 19 of the cover 17 is further attachable to the belt portion 5a by means of a suitable adhesive. This adhesive is heat activated and will attach the second end 19 of the strip 18 to the belt portion 5a when exposed to the body temperature of the wearer over a period of time. As has been described in connection with Figures 2A and 2B above, the first fastener arrangement 6a must be separated from the second fastener arrangement 7a to allow the cover to be deployed and the absorbent article to be removed.

Figure 4B shows the assembled fastener arrangements as the first fastener arrangement 6a has been separated from the second fastener arrangement 7a and is being pulled in the direction A. The strip 18, being attached to the first belt portion 5a, is partially pulled out from under the second fastener arrangement 7a for deployment over the exposed surface of the first fastener arrangement 6a facing the wearer (not shown).

Figure 4C shows a perspective view of the second fastener arrangement 7a and its associated cover 17. The figure indicates a partial area of the front portion 2 and shows the extension of the strip 18 under the second fastener arrangement 7a, between a pair of parallel welds 20, 21 attaching said fastener 7a to the front portion 2. As can be seen from this figure, as well as in Figure 4A, the length of the strip 18 exceeds the length of at least the first fastener arrangement 6a in order to ensure that the first fastener arrangement 6a is covered after deployment.

Figur 5A shows a fastener arrangement according to a fourth embodiment of the invention. In this figure the belt portion 5a with its first fastener arrangement 6a is attached directly onto the surface of the front portion 2. A deployable cover 8a is permanently attached to the belt portion 5a at a first end 22 by means of a suitable adhesive. The cover 8a further comprises a strip 23 of material folded in a zig-zag configuration, which strip has a width and length exceeding the width and length of the first fastener arrangement 6a when deployed. At its opposite, second end 24 the surface of the cover 8a that is exposed to the front portion 2 is provided with an area having predetermined surface friction characteristics. These characteristics are selected to ensure that friction forces between the front portion and said area are sufficient to deploy the protective cover 8a over the first fastener arrangement 6a. The friction forces must cause the protective cover 8a to deploy, without causing chafing while the second end 24 of the cover is in contact with the skin of the wearer. The desired surface friction characteristics can be achieved by material selection or by a suitable surface treatment, such as coating or mechanical working.

Alternatively, the protective cover 8a is arranged to be deployed so that the friction forces retains the second end 24 of the cover 8a in contact with the front portion 2 until the folded strip 23 is substantially fully deployed over the first fastener arrangement 6a. During the final part of the deployment, the second end 24 is folded over, so that said end of the cover having an area of

relatively high surface friction is facing the first fastener arrangement 6a as it is being pulled from under a wearer.

- Figure 5B shows the assembled fastener arrangements as the first fastener arrangement 6a has been separated from the second fastener arrangement 7a and is being pulled in the direction A. The strip 23, being attached to the first belt portion 5a, is partially extended for deployment over the exposed surface of the first fastener arrangement 6a facing the wearer (not shown). The second end 24 of the cover 8a, being attached to the belt portion 5a, is retained by friction and causes the protective cover 8a to be deployed.
- 10 In Figure 5B the front portion 2 and the belt portion 5a are drawn at a distance from each other for reasons of clarity. In actual use, the belt portion 5a would initially be separated from the front portion 2 and subsequently be pulled along the upper surface of said front portion during deployment of the protective cover 8a. During deployment, the second end 24 can either be
- 15 retained in its original position x_1 or be displaced along the upper surface of the front portion 2, as indicated by the position x_2 when approximately half the cover 8a has been deployed. The displaced distance is dependent on a number of factors, such as the coefficient of friction between the front portion 2 and the second end 24 of the cover, the weight of the wearer and the
- 20 speed and force applied to the belt portion 5a during removal thereof. In an alternative embodiment it would also be possible to use the friction between the second end of the protective cover and the skin of the wearer to deploy the said cover.

- In the above embodiments, the adhesive used for permanent or temporary
- 25 attachment of the cover to a surface has been given as a heat activated adhesive. However, for these embodiments it is also possible to use pressure sensitive adhesives. Hook-loop type materials may also be used where applicable.

The materials used for the protective cover may be made from any suitable material, such as a suitable tissue, plastic film or a non-woven. Examples of properties for non-woven or plastic film materials are listed in Table 1 below.

Table 1

Non-woven	Example 1	Plastic film	Example 2
Surface weight (g/m ²)	15	Surface weight (g/m ²)	19
Caliper (μm)	-	Caliper (μm)	40
Tensile strength MD (N/50mm)	38	Tensile strength MD (N/25mm)	21
Tensile strength CD (N/50mm)	18	Tensile strength CD (N/25mm)	17

5

The tensile strength is given in two directions, termed MD and CD. For paper, Machine Direction (MD) is the direction of the paper fibres when running parallel to the forward movement of the paper machine wires. The machine direction runs the length of a paper shipping sack. Because of the paper fibres' orientation, the tensile strength is generally highest in the machine direction. Cross Direction (CD) of paper is at right angles to the machine direction. The cross direction of paper runs the width of a paper sock. Tear strength is generally highest in this direction. These directions are also used for non-woven and plastic film. As can be seen from Table 1, the tensile strength is higher in the machine direction for webs of non-woven and plastic film. Measurement of the tensile strength can be carried out by a number of suitable methods, such as EN 12625-4 for tissue, Edana 20.2-89 for non-woven materials or 18-41-06 ASTM D 82 for plastic film in the cases described here.

20 In the case of non-woven materials, the caliper, or thickness is not given. For this group of materials the surface weight in g/m² will indirectly give the caliper.

Examples of properties for suitable tissue materials are listed in Table 2. In this table, measurements for dry and wet tensile strength are given in two directions, as described above.

25

Table 2

Tissue	Example 3	Example 4
Surface weight (g/m ²)	18	35
Caliper (μm)	130	135
Tensile strength, DRY MD (N/m)	300	390
Tensile strength, DRY CD (N/m)	230	255
Tensile strength, WET MD (N/m)	90	135
Tensile strength, WET CD (N/m)	50	50

- The protective covers used in the above examples can be manufactured in a number of different ways. For instance, each cover can be made as a unit that is attached at a predetermined location on an absorbent article. Such a unit can be held together by frangible means or a suitable adhesive bond, e.g. holding the edges of a folded or pleated strip of material together. Said means or bond is strong enough to hold the unit together during manufacture and assembly of the article, as well as during handling of the finished article.
- 10 The invention is not limited to the above embodiments, but may be varied freely within the scope of the appended claims.

CLAIMS

1. An absorbent article 1 comprising:

5 a liquid permeable topsheet, a backsheet, and an absorbent body enclosed there between;

a front portion, a rear portion and a crotch portion there between;

a pair of belt portions attached to the rear portion and which are fastenable together around a waist of a wearer;

10 at least one pair of fastener arrangements located on each of said pair of belt portions, where a pair of first fastener arrangements are connectable to the front portion such that the article will assume a pant like shape, and that said pair of belt portions form a part of a waist portion of the article,

c h a r a c t e r i z e d i n t h a t

15 the fastener arrangement facing the wearer having a surface that is provided with a deployable protective cover, which cover is deployable over the said surface when a said cover is subjected to a force substantially in the direction of said surface in order to separate the assembled fastener arrangements.

2. Absorbent article according to claim 1, c h a r a c t e r i z e d i n t h a t the first fastener arrangements are connectable directly to the backsheet of the
20 front portion.

3. Absorbent article according to claim 1, c h a r a c t e r i z e d i n t h a t a pair of second fastener arrangements located on either side of said front portion connectable to said first fastener arrangements pair of belt portions.

4. Absorbent article according to claim 1, characterized in that the protective cover is attached to the belt portion at one end and to the front portion at its opposite end when the fastener arrangements are attached.
5. Absorbent article according to claim 4, characterized in that the protective cover is fixedly attached to the belt portion.
6. Absorbent article according to claim 5, characterized in that the protective cover is releasably attached to the front portion.
7. Absorbent article according to claim 6, characterized in that the protective cover is attached to the front portion by a releasable adhesive.
8. Absorbent article according to claim 7, characterized in that the releasable adhesive is a heat activated adhesive.
9. Absorbent article according to claim 6, characterized in that the protective cover is attached to the front portion by a hook-and-loop type attachment means.
10. Absorbent article according to claim 4, characterized in that the protective cover is attachable to the belt portion at one end and releasably attached to the front portion at its opposite end when the fastener arrangements are assembled.
11. Absorbent article according to claim 10, characterized in that the protective cover is attachable to the belt portion by an adhesive.
12. Absorbent article according to claim 11, characterized in that the releasable adhesive is a heat activated adhesive.
13. Absorbent article according to either of claims 8 or 12, characterized in that the heat activated adhesive is activated at a temperature exceeding **28°C**.

14. Absorbent article according to either of claims 8 or 12, characterized in that the heat activated adhesive is activated by the body heat of the wearer.
15. Absorbent article according to any one of the above claims, characterized in that the fastener arrangements are provided with hook-and loop-type attachment means.
16. Absorbent article according to any one of the above claims, characterized in that the first and second fastener arrangements are provided with a pressure sensitive adhesive.
- 10 17. A fastener assembly for attaching a first surface to a second surface, which fastener assembly comprises a first fastener arrangement located on said first surface, and a second fastener arrangement located on said second surface, and being connectable to said first fastener arrangement, characterized in that the first fastener arrangement facing the
15 second surface having a surface that is provided with a deployable protective cover, which cover is deployable over the said surface when a pair of assembled first and second fastener arrangement are subjected to a force substantially in the direction of said surface in order to separate the assembled fastener arrangements. **OK**

1 / 5

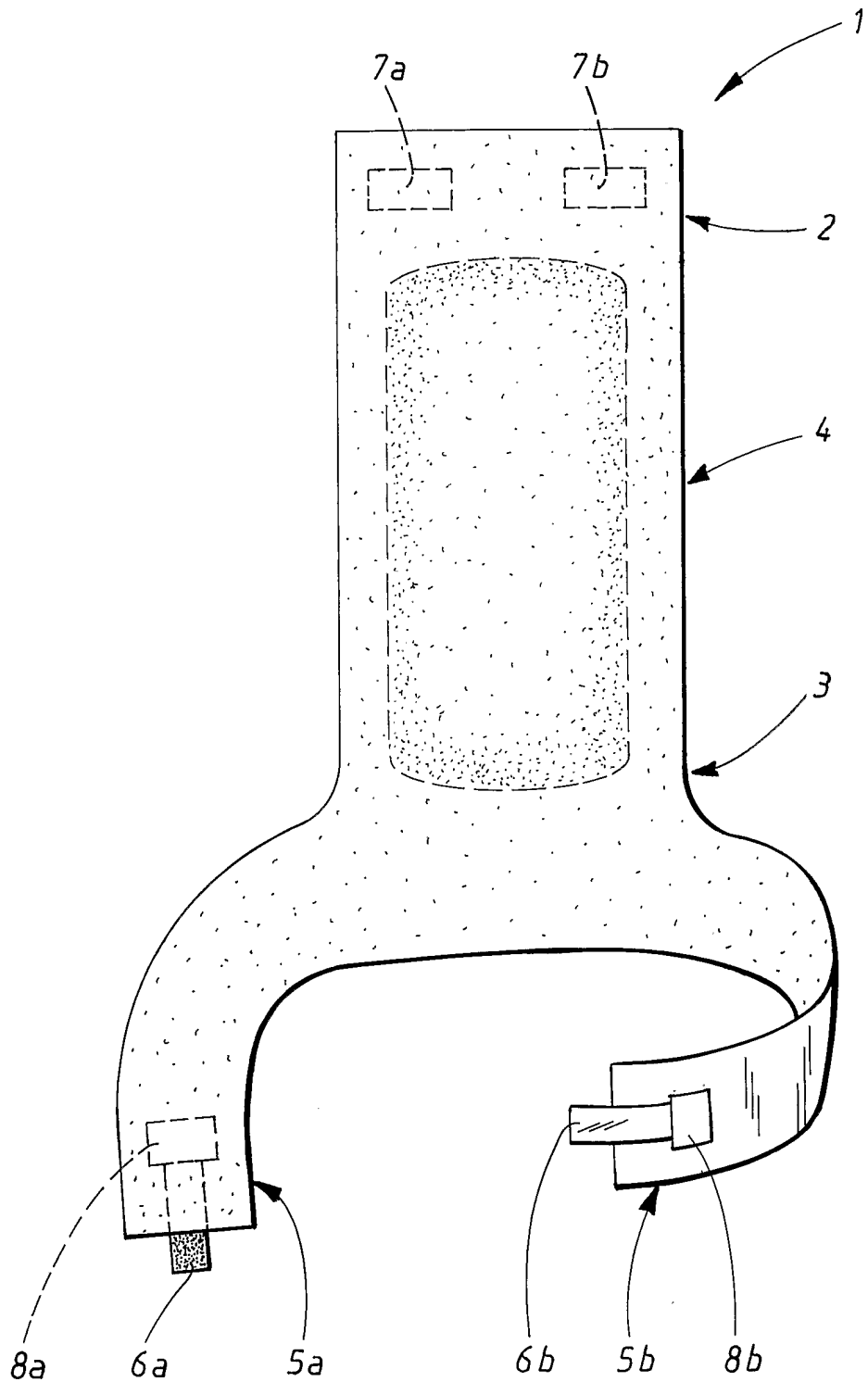


FIG. 1

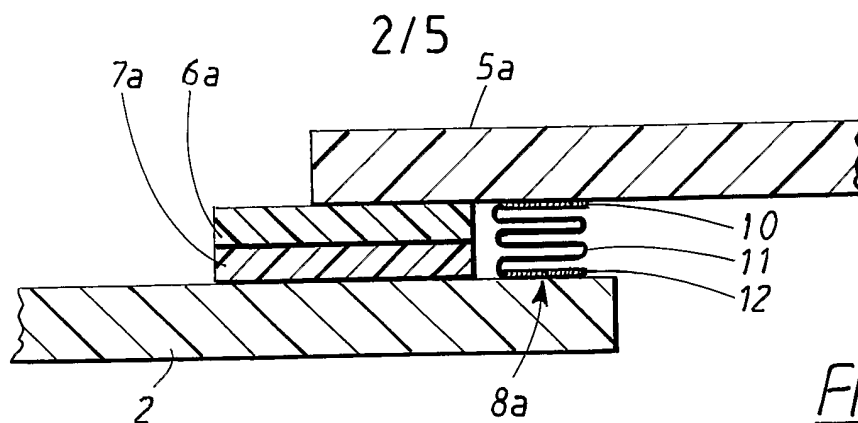


FIG. 2A

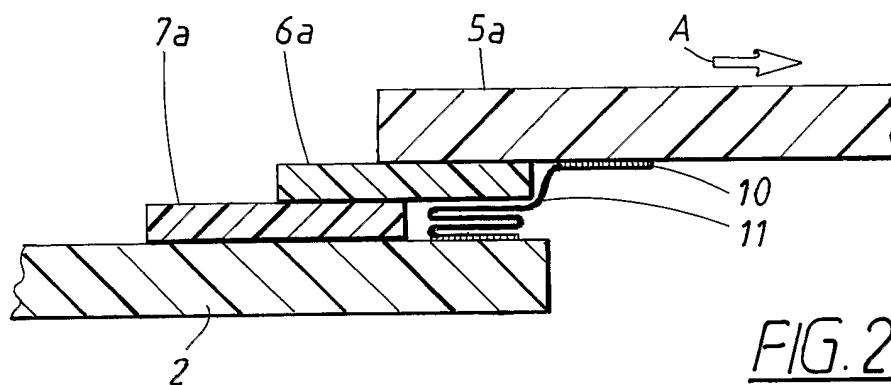


FIG. 2B

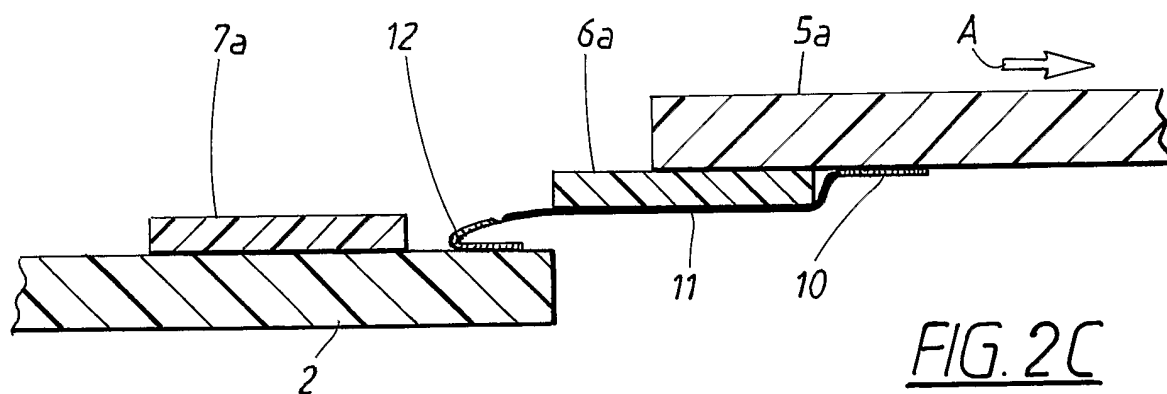


FIG. 2C

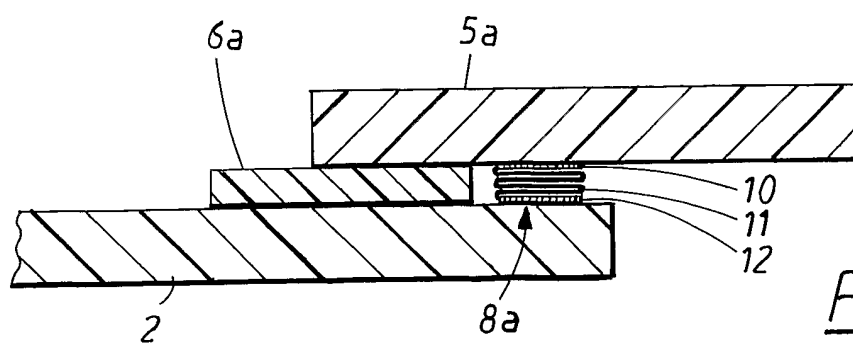


FIG. 2D

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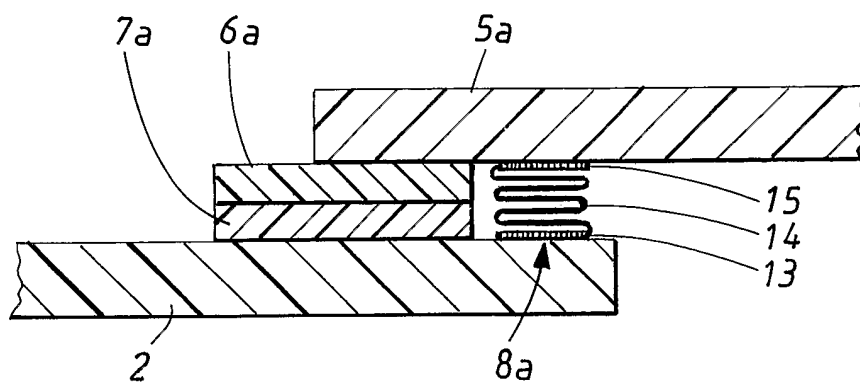


FIG. 3A

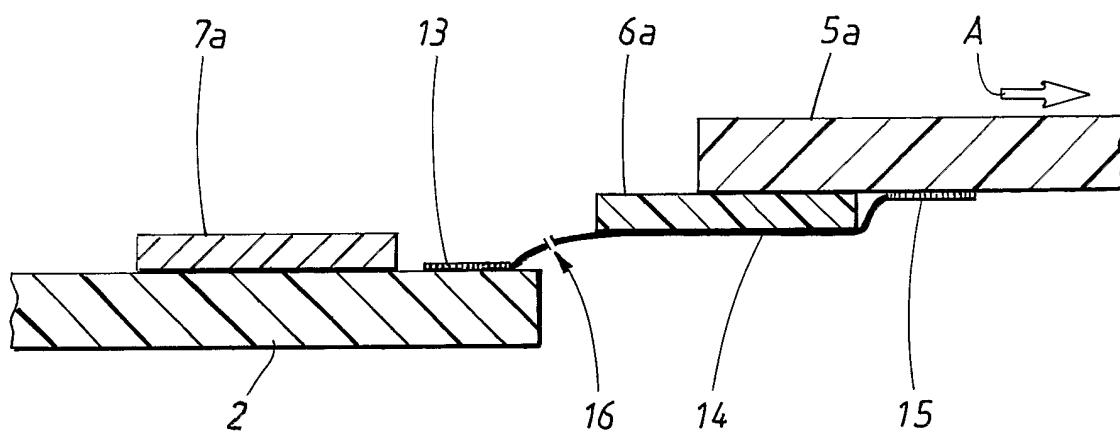


FIG. 3B

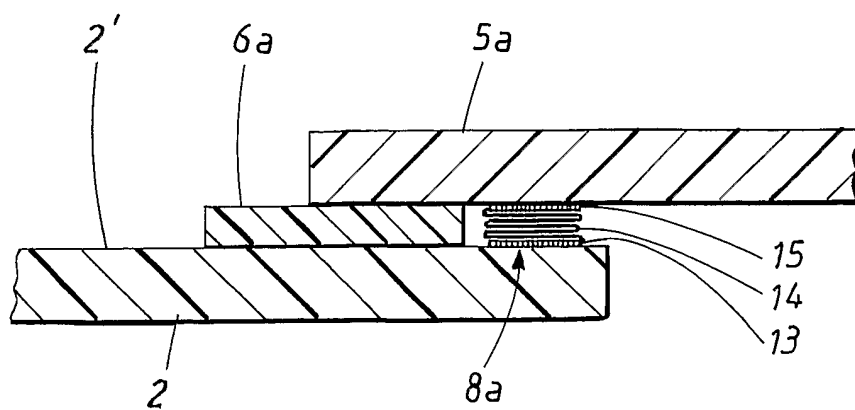


FIG. 3C

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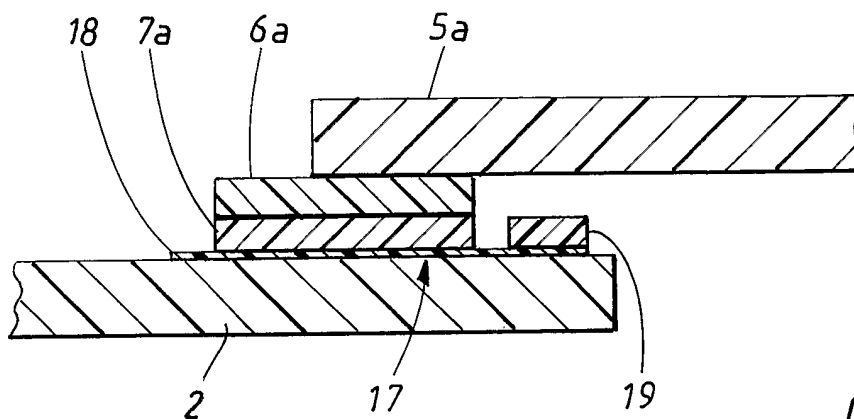


FIG. 4A

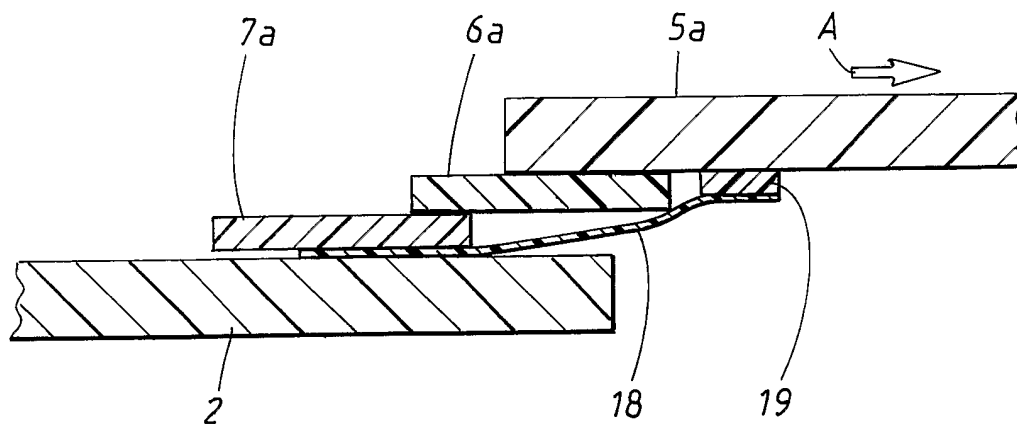


FIG. 4B

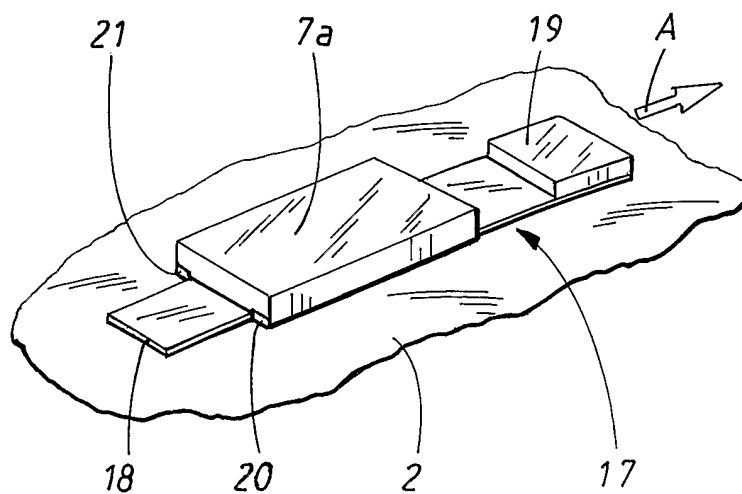


FIG. 4C

5/5

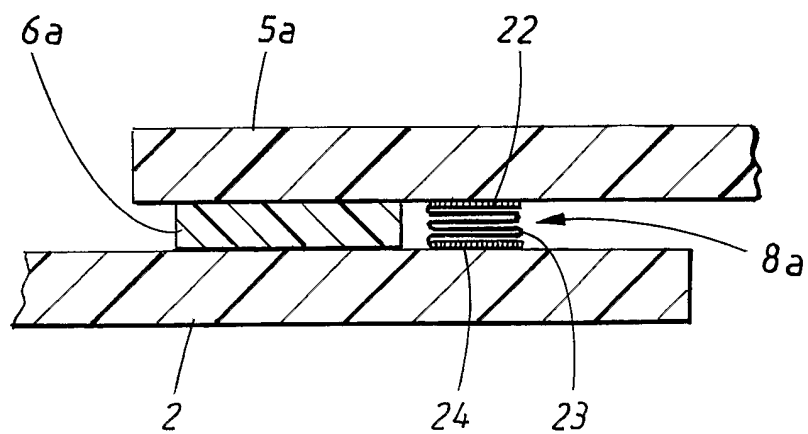


FIG. 5A

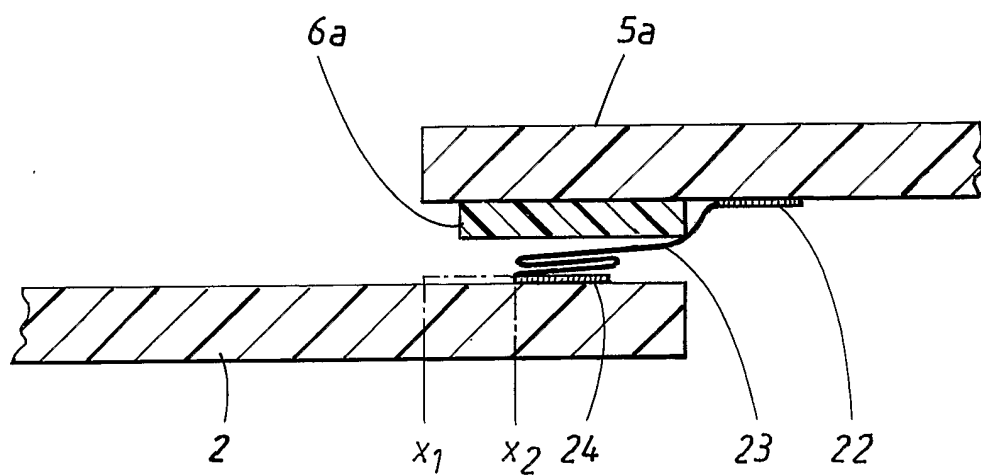


FIG. 5B

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 2004/002001

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A61F 13/61, A61F 13/62

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)

IPC7: A61F

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

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, 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	WO 0222061 A1 (SCA HYGIENE PRODUCTS AB), 21 March 2002 (21.03.2002) --	1-17
A	US 20020023321 A1 (WILLIAM CLUNE), 28 February 2002 (28.02.2002), page 4, column 2 --	1-17
A	US 5392498 A (DAVID J.K. GOULAIT ET AL), 28 February 1995 (28.02.1995) -- -----	1-17

☐ 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 application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

8 Sept 2005

Date of mailing of the international search report

12-09-2005

Name and mailing address of the ISA/

Swedish Patent Office

Box 5055, S-102 42 STOCKHOLM

Facsimile No. +46 8 666 02 86

Authorized officer

Erika Westberg/MP

Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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