



(11)

EP 4 115 759 A1

(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:

11.01.2023 Bulletin 2023/02

(21) Application number: **21765239.5**

(22) Date of filing: **26.02.2021**

(51) International Patent Classification (IPC):

A41H 43/04 ^(2006.01) **A41B 9/00** ^(2006.01)
A41D 13/00 ^(2006.01)

(52) Cooperative Patent Classification (CPC):

A41B 9/00; A41D 13/00; A41H 43/04

(86) International application number:

PCT/JP2021/007375

(87) International publication number:

WO 2021/177172 (10.09.2021 Gazette 2021/36)

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

Designated Extension States:

BA ME

Designated Validation States:

KH MA MD TN

(30) Priority: **03.03.2020 JP 2020036129**

(71) Applicants:

- **Toray Industries, Inc.**
Tokyo, 103-8666 (JP)
- **Toray Industries (H.K.) Ltd.**
Hong Kong (HK)

(72) Inventors:

- **TANIGUCHI, Takamitsu**
Osaka-shi, Osaka 530-8222 (JP)
- **ANDO, Daichi**
Osaka-shi, Osaka 530-8222 (JP)
- **MATSUMOTO, Shingo**
Hong Kong (CN)
- **OTSUKA, Azuki**
Hong Kong (CN)
- **SUGINO, Masanori**
Osaka-shi, Osaka 537-0024 (JP)
- **ITOU, Hirotaka**
Osaka-shi, Osaka 537-0024 (JP)

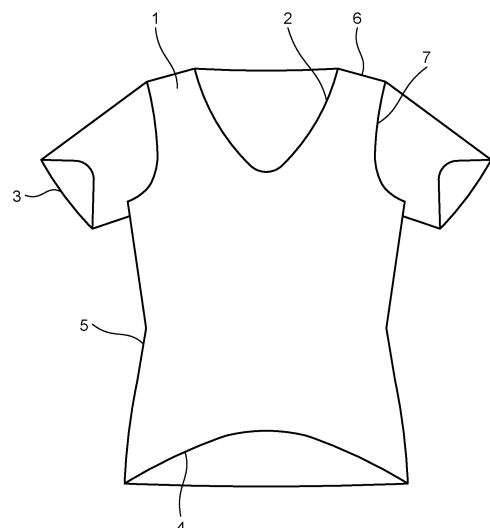
(74) Representative: **Mewburn Ellis LLP**

Aurora Building
Counterslip
Bristol BS1 6BX (GB)

(54) **CLOTHING**

(57) Provided are clothes that can reduce the lack of elongation at a joined part and improve the wearing feeling during light exercise even when the clothes are composed by joining fabrics using an adhesive. The clothes according to the present invention include fabrics having a stretchability; and a joined part where the fabrics are fixed together using an adhesive, in which a difference between a stress of the joined part at 50% elongation in a longitudinal direction of the joined part and a stress of the fabrics fixed by the joined part at 50% elongation in a direction parallel to the longitudinal direction of the joined part is within 30%.

FIG.1



EP 4 115 759 A1

Description

Field

5 **[0001]** The present invention relates to clothes.

Background

10 **[0002]** Conventionally, a technique of joining fabrics together by an adhesive instead of joining fabrics together by using a sewing machine to compose clothes has been known. For example, in Patent Literature 1, a related technique of composing the hem part of a swimsuit or the like by bonding outer fabrics together with a hot-melt sheet in the case where the outer fabrics such as the hem of a swimsuit or the like are folded has been developed.

15 **[0003]** On the other hand, as a technique of providing elongation properties to a joined part where fabrics are joined together using an adhesive, a technique of joining fabrics composing clothes together using an adhesive attached in the form of dots has been known. For example, in Patent Literature 2, a technique of bonding fabrics together with an adhesive repeatedly provided in a dot or zigzag shape has been developed in the case where the body and sleeves of an undershirt are joined.

Citation List

20

Patent Literature

[0004]

25 Patent Literature 1: Japanese Patent Application Laid-open No. 2005-264394
Patent Literature 2: Japanese Patent No. 6249821 Summary

Technical Problem

30 **[0005]** Even for clothes composed using these techniques, however, the joined part between the fabrics is felt to be relatively difficult to stretch when the clothes are actually touched and worn, and thus uncomfortable feeling to the sense of touch and wearing feeling remains, although the numerical elongation properties are provided to the joined part where fabrics are joined together. This is because the conventional techniques have focused only on the elongation properties at the joined part, whereby the essence of the uncomfortable feeling has not been completely captured when the clothes
35 have been actually touched and worn. In other words, the cause of the uncomfortable feeling felt when the product is actually touched and worn is that the difference in elongation properties between the joined part and the fabrics adjacent to the joined part is so large that the difference in the outstanding elongation properties of the joined part and the fabrics adjacent to the joined part is felt as the uncomfortable feeling. Even when the elongation properties of the joined part are excellent, the sense of touch and wearing feeling have not been always satisfactory. In particular, not only when the
40 closes are worn but also in the sense of resistance and hand feeling in a relatively low-stretch region such as when the clothes are held by hands and lightly stretched, the elongation properties of the adjacent fabrics usually have a further better state even if the elongation properties of the joined part are excellent. Consequently, the outstanding difference between the joined part and the adjacent fabrics has caused uncomfortable feeling to be generated. In particular, in the case where the edge of the opening part is folded back and fixed with an adhesive, the difference in the elongation
45 properties between the joined part and the fabrics adjacent to the joined part is easily felt when the clothes are worn and thus this difference has caused deterioration in the wearing feeling.

[0006] The present invention is made in view of the above description and an object of the present invention is to provide clothes that can improve uncomfortable feeling when the joined part is actually touched and the clothes are worn, even when fabrics are joined using an adhesive to compose the clothes.

50

Solution to Problem

[0007] To solve the problem described above and to achieve the object, clothes according to the present invention includes: fabrics having a stretchability; and a joined part where the fabrics are fixed together using an adhesive. A
55 difference between a stress of the joined part at 50% elongation in a longitudinal direction of the joined part and a stress of the fabrics fixed by the joined part at 50% elongation in a direction parallel to the longitudinal direction of the joined part is within 30%.

[0008] In the clothes according to the present invention, the joined part is fixed by a dot adhesive arranged in a single

row or multiple rows, and a ratio of an area occupied by the adhesive at the joined part is 35% or less.

[0009] In the clothes according to the present invention, a peeling force at time of opening and peeling the joined part in the longitudinal direction is 10 N/cm or more.

[0010] In the clothes according to the present invention, a peeling force of the joined part in the longitudinal direction after high temperature washing at 92°C is 75% or more of the peeling force before the washing.

[0011] In the clothes according to the present invention, the joined part is an opening part through which a wearer's human body part passes; and the opening part has a structure in which a fabric edge is folded in two, and the opening part is formed by fixing the fabric edge and a fabric body with a dot adhesive attached in a single row or multiple rows along the fabric edge.

Advantageous Effects of Invention

[0012] According to the present invention, the clothes that can improve uncomfortable feeling when the joined part is actually touched and the clothes are worn, even when fabrics are joined using an adhesive to compose the clothes, can be provided.

Brief Description of Drawings

[0013]

FIG. 1 is a view illustrating the appearance of clothes according to the first embodiment.

FIG. 2 is a schematic view of a side joined part in the clothes illustrated in FIG. 1.

FIG. 3 is a view illustrating the joined part of the opening part of the clothes illustrated in FIG. 1 through which an arm passes.

FIG. 4 is a view schematically illustrating how an adhesive arranged at the joined part is attached.

FIG. 5 is a view illustrating the appearance of clothes according to the second embodiment.

Description of Embodiments

[0014] Hereinafter, embodiments for carrying out the present invention (hereinafter, referred to as "embodiments") will be described with reference to the attached drawings. It should be noted that the drawings are merely schematic.

(First embodiment)

[0015] FIG. 1 is a view schematically illustrating the clothes 1 according to the first embodiment. The clothes 1 illustrated in FIG. 1 is an example of the top of a short-sleeved underwear and has opening parts 2, 3, and 4 through which a head, arms, and a body pass. In addition, the clothes 1 are joined at the side, shoulder, and armhole joined parts 5, 6, and 7.

[0016] The clothes 1 are made of stretchable fabrics. For example, a circular knitting material and a warp knitting material have a stretchability required for carrying out the present invention and thus materials are not particularly limited as long as the materials are knitted materials provided as the materials for general clothes. Even when the materials are textile materials, materials for clothes having a stretchability are suitable for the present invention. The clothes 1 can be applied to materials for general underwear and innerwear having cups, and in addition, for outerwear such as T-shirts and cut-and-sews and are not limited thereto.

[0017] FIG. 2 is a view illustrating an example of an aspect of a joined part of the side joined part 5 in the clothes 1. In the clothes 1, instead of sewing a fabric 8 and a fabric 8a composing the main front piece and the main back piece together using a sewing machine, the side joined part 5 is composed by overlapping a fabric edge and a fabric edge and fixing these edges using a dot adhesive 9 between these edges. In the present invention, the joined part 5 is composed so that the difference between a stress of the joined part 5 at 50% elongation in the longitudinal direction 10 of the joined part 5 and a stress of the fabric 8 or 8a fixed by the joined part 5 at 50% elongation in a direction 11 parallel to the longitudinal direction of the joined part 5 is within 30%. This allows the joined part 5 to be less likely to be felt as a hard-to-stretch part and thus the uncomfortable feeling during wearing to be reduced when the clothes 1 is actually touched and worn. The clothes 1 is composed so that the difference is preferably set within 25% and more preferably set within 20% and thus the clothes 1 generating no uncomfortable feeling at the joined part 5 and having excellent wearing feeling can be obtained. Here, although the description is made using the joined part 5 as an example, the above description is also applicable to the joined parts 6 and 7. In addition, for example, at the armhole joined part 7, the elongation rates of the fabrics may differ on both sides of the joined part 7. In such a case, when the fabric having the lower stress at 50% elongation is used as a comparison target, the difference in elongation properties between the adjacent joined part and the fabric becomes smaller and thus the uncomfortable feeling is less likely to be felt.

[0018] In addition, in the opening parts 2, 3, and 4, the joined part composed of a structure in which the fabric edge is folded in two and the formed by fixing the fabric edge and the fabric body with the dot adhesive 9 attached in a single row or multiple rows along the fabric edge is also composed so that the difference between a stress of the joined part at 50% elongation in the longitudinal direction of the joined part and a stress of the fabrics fixed by the joined part at 50% elongation in a direction parallel to the longitudinal direction of the joined part is within 30%. FIG. 3 is a view illustrating the joined part of the opening part 3 of the clothes 1 through which an arm passes. The opening part 3 is a structure in which the fabric edge is folded in two. The folded fabric edge and the fabric body are fixed by the adhesive 9 that is arranged in two rows at the fabric edge. The opening part 3 is also composed so that the difference between a stress of the joined part at 50% elongation in the longitudinal direction 16 of the joined part and a stress of the fabric 18 in which the fabric edge and the fabric body are fixed by the joined part at 50% elongation in a direction 17 parallel to the longitudinal direction of the joined part is within 30%, whereby the clothes 1 generating no uncomfortable feeling at the joined part and having excellent wearing feeling can be obtained.

[0019] With respect to the clothes 1 according to the present invention, the stress at 50% elongation is important. In general, as an index representing the elongation ratio of the clothes materials, elongation properties are frequently represented by an elongation ratio at a load of 1.5 kg. However, the elongation load to this level is rarely applied when the clothes 1 are actually worn or light exercise is performed. The elongation required for actually wearing the clothes 1 is an elongation ratio of about 50% and thus the difference in the stresses in this region is important.

[0020] As the direction of stretch of a single fabric, stretching the single fabric in a direction parallel to the longitudinal direction of the comparing joined part 5 in the state of the clothes 1 is important. In other words, the direction of elongation is not always a warp direction or a weft direction of the fabric. The direction differs depending on the cut shape of the fabric composing the clothes 1 and the direction where the fabric is taken.

[0021] The measurement method of the stress at 50% elongation is performed in accordance with the grab method of elongation rate described in JIS-L-1096 (2010). In the case where a sample having a desired size cannot be taken depending on the design of the clothes 1, the measurement may be performed by reducing the sample size to 5 cm in width and 10 cm in length and setting the gripping spacing to 5 cm. For the stress measurement at the joined part, the sample may be taken by joining the joined part and the fabric region connecting to the joined part. In the case of an aspect in which fabric edges are overlapped and joined, the sample is taken so that the joined part is centered. On the other hand, in the case of an aspect in which the fabric edge is folded and connected, the same is true for collectively taking the sample the joined part and the fabric region connecting to the joined part. It is important that the adhesive region is gripped when the sample is gripped with a tensile tester. The sample is gripped at the position where the edge of the grip and the folded edge are aligned as much as possible and the measurement is performed.

[0022] In addition, in the stress measurement of the single fabric, a sample may be taken at any part of the same fabric as long as the part is in a direction parallel to the longitudinal direction of the joined part. It is important that the sample does not include other components including the joined part that worsen the elongation properties.

[0023] In the joined part 5 of the clothes 1, the adhesive 9 is arranged in two rows of dots along the edge of the fabric 8 or 8a. The preferable size of the adhesive 9 is different depending on the structure and thickness of the fabrics 8 and 8a composing the clothes 1. Dots having a diameter of about 1.0 mm to about 2.0 mm can easily provide relatively strong adhesive strength. However, in the case of a thin fabric, the adhesive may seep through to the front side of the fabric and stand out and thus appearance may deteriorate. Consequently, the dots are preferably smaller in a range where required bonding strength is achieved. In the case of an inner fabric having a fabric thickness of about 0.5 mm to about 0.8 mm, an adhesive having a diameter of 1.0 mm or less is preferable because the adhesive is less likely to seep through to the front side of the fabric. In the case of further thinner fabrics having a fabric thickness of about 0.3 mm to about 0.5 mm, an adhesive having a diameter of 0.6 mm or less is preferable because the seepage of the adhesive is less likely to stand out. The adhesive 9 is in the shape of a circle in the first embodiment but is not limited to this shape. The shape of the adhesive 9 may be any shape as long as the adhesive 9 can be repeatedly attached in a separated state. The shape may be a linear shape as long as the linear shape is not continuous. The shape may also be geometric shapes such as triangular, square, oval, or the like and may also be a combination of these shapes.

[0024] Synthetic resins are more preferable than natural resins as the resins that compose the adhesive 9 used in the clothes 1. Of these resins, thermoplastic resins are more preferable. For example, the resins are not particularly limited as long as the resins are made of macromolecule compounds such as polyethylene, polypropylene, polyvinyl chloride, polystyrene, polyvinyl acetate, polyurethane, polytetrafluoroethylene, polyacrylic, polyamide, polyacetal, polycarbonate, polyphenylene ether, polyester, polyphenylene sulfide, polysulfone, polyethersulfone, polyetheretherketone, polyimide, and polyamideimide and various macromolecule compounds can be used.

[0025] The resin composing the adhesive 9 is preferably a reactive hot melt. When the resin is the reactive hot melt, an adhesive structure having excellent heat resistance, solvent resistance, and the like can be formed by softening or melting the resin to penetrate between structures at the bonding sites, cooling and solidifying the resin, and thereafter developing cross-linking by reacting the resin with the surrounding moisture.

[0026] In the clothes 1, it is important that the ratio of an area where the adhesive 9 is attached at the joined part is

35% or less. The area is preferably 30% or less and more preferably 25% or less. This allows the difference between the stress of the joined part at 50% elongation in the longitudinal direction and the stress of the fabrics fixed by the joined part at 50% elongation in the direction parallel to the joined part to be easily retained within 30% and thus the uncomfortable feeling can be reduced. The ratio of the area where the adhesive is attached at the joined part is preferably 5% or more from the viewpoint of retaining the bonding strength at the joined part. The ratio is more preferably 10% or more and further preferably 15% or more. FIG. 4 is a view schematically illustrating how the adhesive 9 arranged at the joined part is attached. The ratio of the area of adhesive 9 at the joined part can be calculated from the following formula as the ratio of the area of the adhesive 9 in the area determined from the width 12 of the joined part and the pitch 13 at which the adhesive 9 is attached.

$$\text{Ratio of area of adhesive in joined part} = \left(\frac{\text{Area of adhesive between unit pitches}}{\text{Width 12 of joined part} \times \text{Pitch 13 at which adhesive is attached}} \right) \times 100\%$$

In addition, the case where the pitch at which the adhesive 9 is attached at the joined part is not uniform can be considered. In such a case, the ratio can be produced from the area of adhesive attached in the gripping spacing in the stress measurement method at 50% elongation described above and is determined to be an average value measured at any five positions. Namely,

$$\text{Ratio of area of adhesive in joined part} = \left(\frac{\text{Area of adhesive attached in gripping spacing}}{\text{Width 12 of joined part} \times \text{Gripping spacing}} \right) \times 100\%.$$

[0027] With respect to the clothes 1 according to the present invention, it is important that the peeling force when the joined part is opened and peeled off in the longitudinal direction is 10 N/cm or more. The peeling force is more preferably 20 N/cm or more. In order to reduce the stress of the joined part at 50% elongation described above, reduction in the area occupied by the adhesive at the joined part may be exemplified. However, this results in also reducing the peeling force at the joined part and causing peeling after repeated wear and washing and thus may easily cause a problem. From this result, in order to secure durability as the clothes 1, the peeling force is preferably 10 N/cm or more and preferably 20 N/cm or more in terms of per 1 cm width of the joined part.

[0028] In general, as an indicator of the strength of the joined part represented by sewing with a sewing machine, the strength when the joined part is pulled in the direction orthogonal to the longitudinal direction of the joined part is used. However, the desired pulling test may not be reproducible depending on the design of the clothes. Consequently, as the clothes 1 according to the present invention, it is suitable that the peeling force when the joined part is opened and peeled in the longitudinal direction of the joined part is evaluated as the bonding strength. The method of measurement is performed in accordance with the test method for peeling strength described in JIS-L-1086 (2013) and the obtained results are represented by converting the peeling strength per width of the joined part into the peeling strength per 1 cm.

[0029] With respect to the clothes 1 according to the present invention, peeling force measured by opening and peeling the joined part in a longitudinal direction after high-temperature washing at 92°C is preferably 75% or more of the peeling force before the washing. This ratio is more preferably 80% or more and further preferably 90% or more. The washing method is equivalent to 5-times washing of the 9N method specified in JIS-L-1930 (2014). This allows sufficient durability to be secured even when the repeated wear and washing are performed in the case where the area occupied by the adhesive 9 is reduced in order to reduce the above-described stress at 50% elongation. In addition, the clothes 1 can secure sufficient durability to the high temperature washing that is commonly performed in Europe.

(Second embodiment)

[0030] FIG. 5 is a view illustrating the form of the clothes according to the second embodiment. The clothes 20 illustrated in FIG. 5 are an example of an underwear such as a pair of shorts having opening parts 22 and 23 through which the body and both legs pass. In addition, the clothes 20 are also joined at the side joined parts 21. It goes without saying that in the second embodiment, the same point of view as the first embodiment can be adopted to achieve the effects of the present invention.

[0031] The embodiments for implementing the present invention have been described above. The present invention

should not be limited by the embodiments described above. For example, the same effect may be provided to openings and other joined parts of clothes such as hats, arm covers, and clothes with cups.

[Examples]

(Example 1)

[0032] In a clothes 1 that was a common underwear as illustrated in FIG. 1, the dot adhesive 9 having a diameter of 0.8 mm (1 mm after bonding) was applied along the edge of a fabric for the neckline opening 2 and the fabric edge was folded in two in the manner illustrated in FIG. 3. The adhesive 9 was applied in three rows. Both of the pitch of the row spacing and the pitch in the longitudinal direction of the application were set to a spacing of 2 mm. The width of the region to which adhesive 9 was applied was 5 mm. The folded width of the fabric edge was set to 7 mm. The test specimen of Example 1 was obtained by bonding the fabric edge with a general flat plate heat press machine. As the adhesive, a reactive hot melt PU resin having a viscosity of about 12,000 mPa·s at 120°C was used. The obtained test specimen was evaluated for an elongation ratio at 1.5 Kg load, stress difference at 50% elongation between the joined part and the fabric, peeling force, peeling force retention ratio after high temperature washing, and resistance feeling when the joined part was stretched. The results are listed in Table 1. The resistance feeling when the joined part is stretched is the uncomfortable feeling when a fabric including the joined part is stretched by hand. "o" means that the joined part is stretched together with the fabric when the fabric is stretched and no resistance exists, whereas "x" means that resistance exists at the joined part when the fabric is stretched.

(Example 2)

[0033] In a clothes 1 that was a common underwear as illustrated in FIG. 1, the dot adhesive 9 having a diameter of 0.8 mm (1 mm after bonding) was applied along the edge of a fabric for the side joined part 5. At this time, the adhesive was applied in three rows. The pitch of the row spacing was set to 2 mm and the pitch in the longitudinal direction of the adhesive application was set to 1.8 mm. The structure of joined part 5 was determined to be an aspect in which the adjacent fabrics were overlapped as illustrated in FIG. 2. The number of rows and the application pitch of the adhesive 9 were the same as those in Example 1. The overlap width between the adjacent fabrics was set to 7 mm. The bonding was performed by the same method as the method in Example 1 to give a test specimen of Example 2. The results that were evaluated in the same manner as the manner in Example 1 are listed in Table 1.

(Example 3)

[0034] The test specimen of Example 3 was obtained by the same manner as the manner in Example 2 except that the pitch of the application of the adhesive 9 in the longitudinal direction was set to 1.6 mm. The results that were evaluated in the same manner as the manner in Example 1 are listed in Table 1.

(Example 4)

[0035] The test specimen of Example 4 was obtained by the same manner as the manner in Example 1 except that the diameter of the adhesive 9 was set to 0.4 mm (0.5 mm after bonding). The results that were evaluated in the same manner as the manner in Example 1 are listed in Table 1.

(Comparative Example 1)

[0036] In a commonly sold underwear as illustrated in FIG. 1, a side joined part was used as the test specimen of Comparative Example 1 with respect to an underwear in which the side joined part was joined by a tape-like adhesive.

(Comparative Example 2)

[0037] In a pair of commonly sold shorts as illustrated in FIG. 5, the side joined part 21 is composed in an overlapped aspect as illustrated in FIG. 2. The joined part in which the dot adhesive having a diameter of 2.0 mm was applied in a region having a width of 5 mm in two rows and in a pitch in a longitudinal direction of 2.0 mm was used as the test specimen of Comparative Example 2. The results that were evaluated in the same manner as the manner in Example 1 are listed in Table 1.

(Comparative Example 3)

[0038] In Comparative Example 3, in a commonly sold underwear as illustrated in FIG. 1, a joined part in which a shoulder joined part was formed by bonding in a zig-zag pattern was used as the test specimen of Comparative Example 3. The results that were evaluated in the same manner as the manner in Example 1 are listed in Table 1.

(Comparative Example 4)

[0039] In Comparative Example 4, the specimen was obtained in the same manner as the manner in Example 1 except that the pitch of the adhesive application in the longitudinal direction was set to 1.0 mm. The results that were evaluated in the same manner as the manner in Example 1 are listed in Table 1.

Table 1

	Example 1	Example 2	Example 3	Example 4	Comparative Example 1	Comparative Example 2	Comparative Example 3	Comparative Example 4
Shape of adhesive	Dots	Dots	Dots	Dots	Tape (planar)	Dots	Zigzag	Dots
Structure of joined part	Folding fabric edge in two	Overlapping	Overlapping	Folding fabric edge in two	Overlapping	Overlapping	Overlapping	Folding fabric edge in two
Width of joined part	5.0	5.0	5.0	5.0	8.0	5.0	6.0	5.0
Pitch of adhesive (longitudinal direction)	2.0	1.8	1.6	2.0	-	2.0	2.5	1.0
Diameter (width) of adhesive	1.0	1.0	1.0	0.5	8.0mm Width	2.0	1.0mm Width	1.0
Ratio of area of adhesive	23.6%	26.1%	29.4%	5.9%	100.0%	62.8%	43.0%	47.1%
Elongation ratio at 1.5kg load	175%	111%	102%	176%	110%	104%	203%	155%
Stress difference between joined part and single fabric at 50% elongation	18.4%	22.0%	24.2%	11.5%	70.2%	53.8%	47.1%	32.4%
Converted value of peeling force	21.6	22.0	22.0	8.8	8.6	31.4	24.2	23.5
Peeling force retention ratio after washing	81.8%	80.5%	81.2%	75.0%	64.3%	75.0%	87.0%	81.0%
Resistance feeling when stretching joined part	°	°	°	°	×	×	×	×

Reference Signs List

[0040]

- 5 1 Clothes
2 Opening part through which head passes
3 Opening part through which arm passes
4 Opening part through which body passes
5 Side joined part
10 6 Shoulder joined part
7 Armhole joined part
8, 8a, 18 Fabric
9 Adhesive
10, 16 Longitudinal direction of joined part
15 11, 17 Direction parallel to longitudinal direction of joined part
12 Width of joined part
13 Pitch where adhesive is attached
20 Clothes
21 Side joined part
22 Opening part through which body passes
23 Opening part through which leg passes

Claims

- 25 1. Clothes comprising:
- fabrics having a stretchability; and
a joined part where the fabrics are fixed together using an adhesive, wherein
30 a difference between a stress of the joined part at 50% elongation in a longitudinal direction of the joined part and a stress of the fabrics fixed by the joined part at 50% elongation in a direction parallel to the longitudinal direction of the joined part is within 30%.
- 35 2. The clothes according to claim 1, wherein the joined part is fixed by a dot adhesive arranged in a single row or multiple rows, and a ratio of an area occupied by the adhesive at the joined part is 35% or less.
3. The clothes according to claim 1 or 2, wherein a peeling force at time of opening and peeling the joined part in the longitudinal direction is 10 N/cm or more.
- 40 4. The clothes according to any one of claims 1 to 3, wherein a peeling force of the joined part in the longitudinal direction after high temperature washing at 92°C is 75% or more of the peeling force before the washing.
5. The clothes according to any one of claims 1 to 4, wherein
- 45 the joined part is an opening part through which a wearer's human body part passes; and
the opening part has a structure in which a fabric edge is folded in two, and the opening part is formed by fixing the fabric edge and a fabric body with a dot adhesive attached in a single row or multiple rows along the fabric edge.

FIG.1

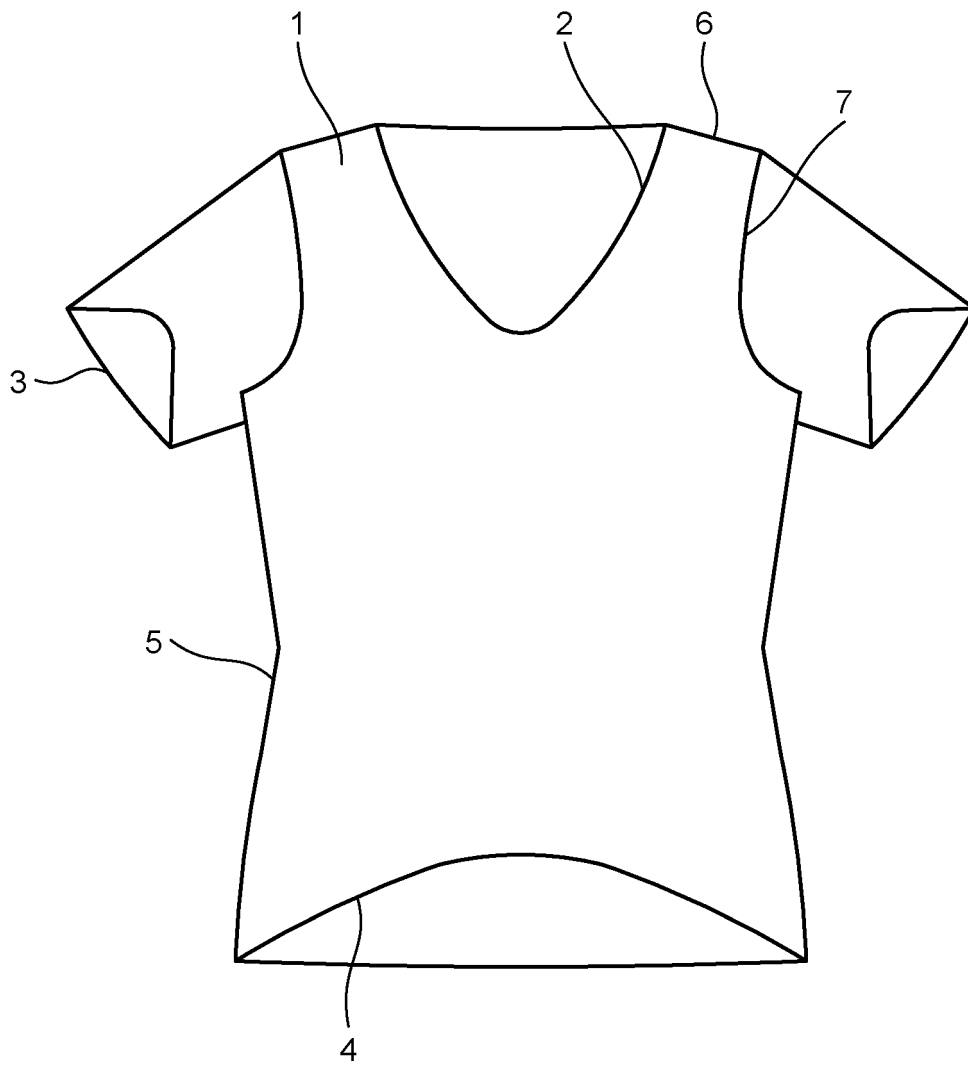


FIG.2

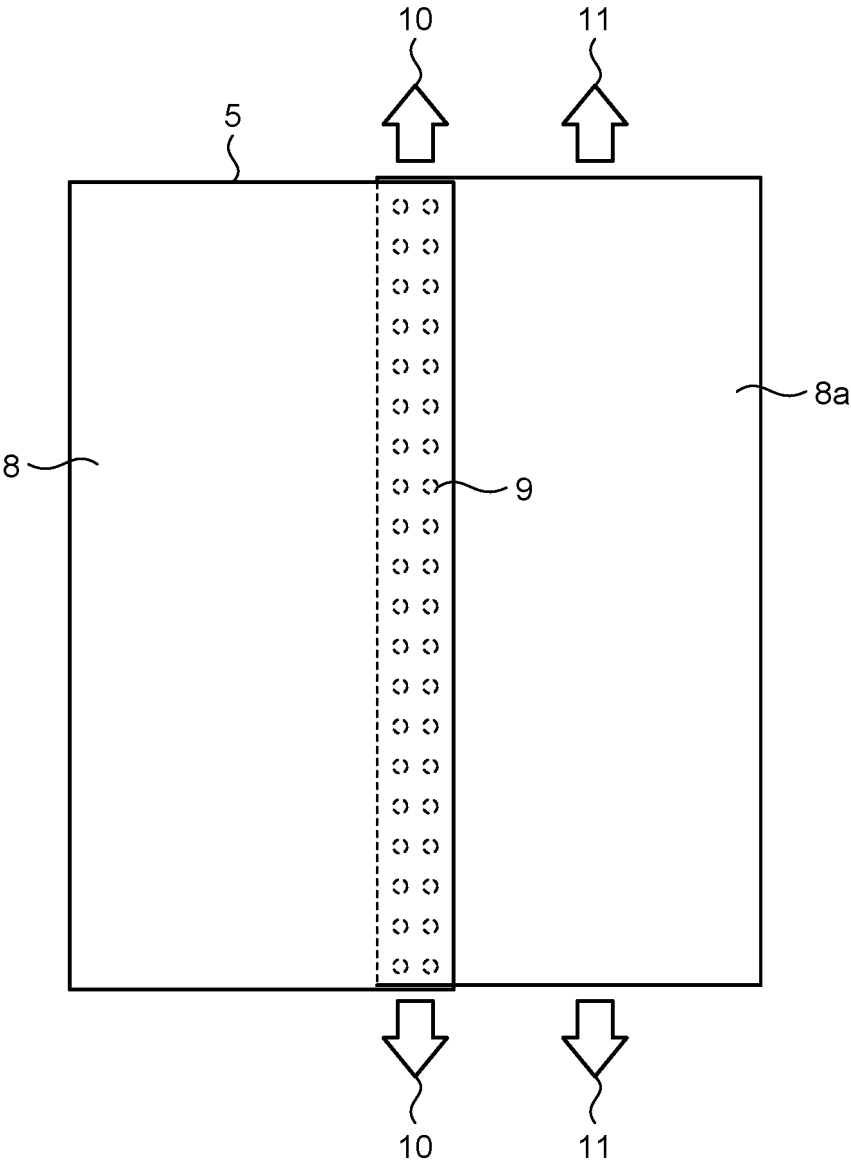


FIG.3

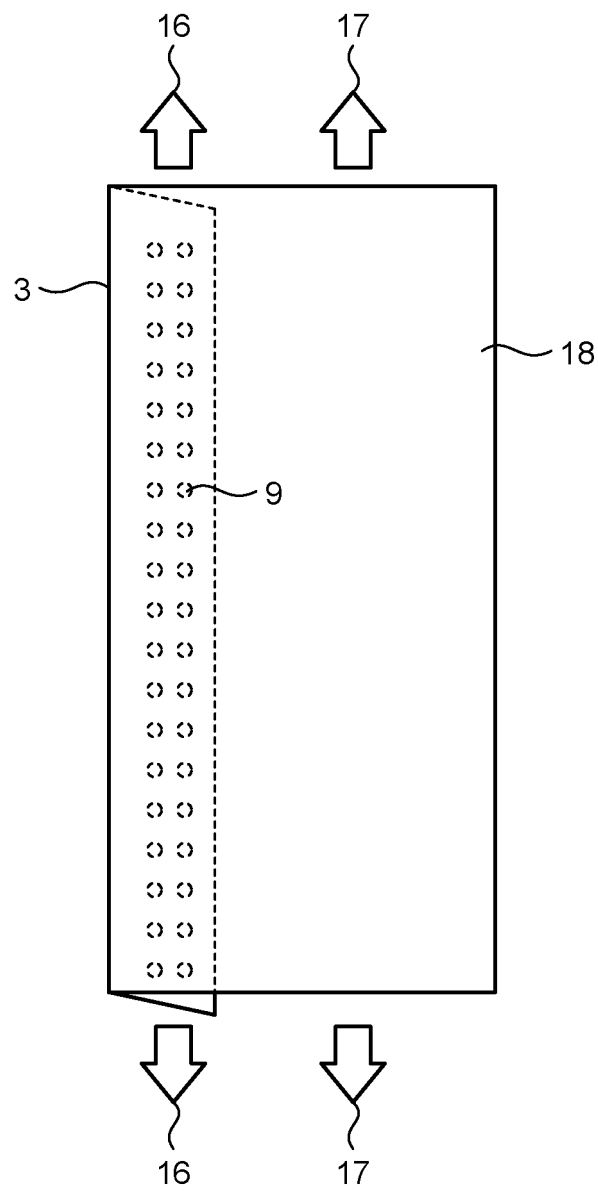


FIG.4

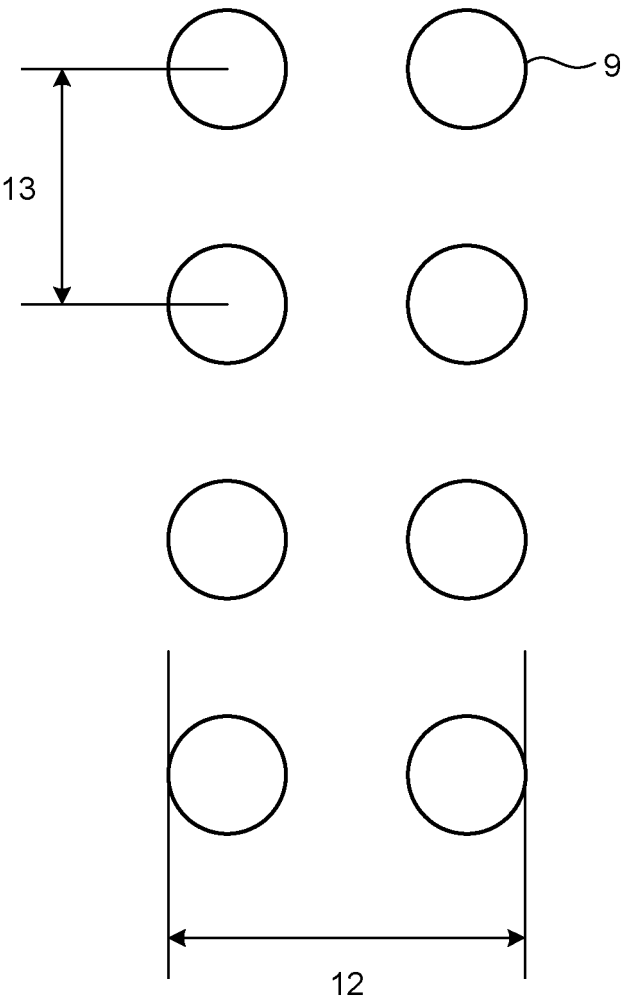
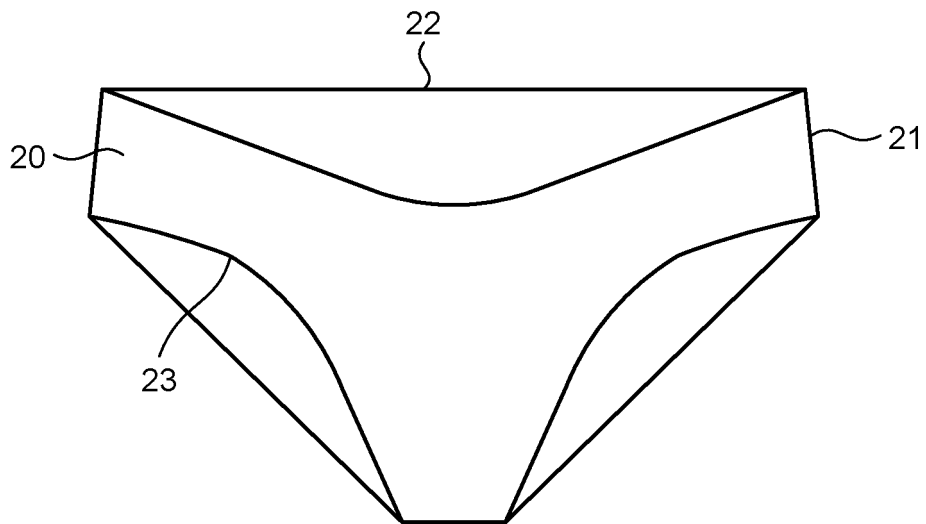


FIG.5



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2021/007375

A. CLASSIFICATION OF SUBJECT MATTER

A41H 43/04 (2006.01) i; A41B 9/00 (2006.01) i; A41D 13/00 (2006.01) i
 FI: A41B9/00 Z; A41D13/00 102; A41H43/04 Z

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)

A41H43/04; A41B9/00; A41D13/00

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

Published examined utility model applications of Japan 1922-1996

Published unexamined utility model applications of Japan 1971-2021

Registered utility model specifications of Japan 1996-2021

Published registered utility model applications of Japan 1994-2021

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2016-74996 A (GUNZE LIMITED) 12 May 2016 (2016-05-12) paragraphs [0008], [0043]-[0045], [0059], [0062], fig. 4, 6, 8	1-4
Y		5
Y	JP 3210964 U (HIMAWARI STYLE KK) 15 June 2017 (2017-06-15) paragraph [0058], fig. 9	5
A	JP 6249821 B2 (GUNZE LIMITED) 20 December 2017 (2017-12-20)	1-5



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
06 May 2021 (06.05.2021)Date of mailing of the international search report
18 May 2021 (18.05.2021)Name and mailing address of the ISA/
Japan Patent Office
3-4-3, Kasumigaseki, Chiyoda-ku,
Tokyo 100-8915, Japan

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/JP2021/007375

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
JP 2016-74996 A	12 May 2016	(Family: none)	
JP 3210964 U	15 Jun. 2017	(Family: none)	
JP 6249821 B2	20 Dec. 2017	(Family: none)	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP 2005264394 A [0004]
- JP 6249821 B [0004]