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(54) Title: FASTENING BELT AND HYGIENIC PRODUCTS COMPRISING SAME

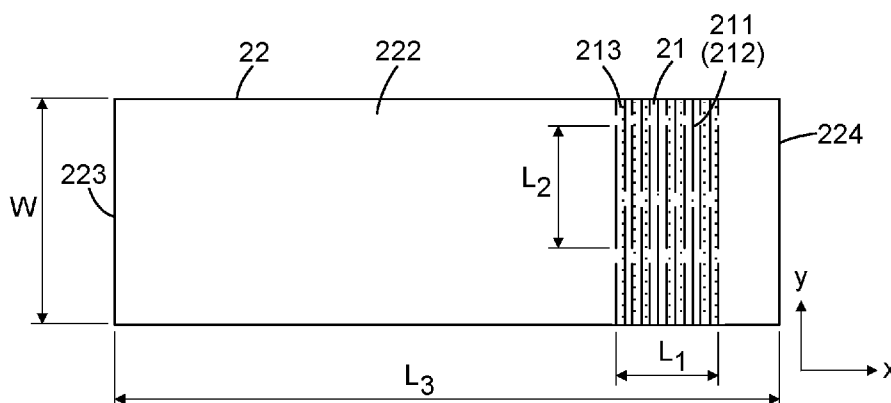


Fig. 2a

(57) Abstract: The present invention provides a fastening belt and a hygienic product comprising the fastening belt, in which a buckle structure is disposed on an elastic fastening belt body, and one end of the fastening belt body is secured to an object to be fastened. When the other end of the fastening belt body is under stress, the fastening belt body can be drawn and stretched, drawing and stretching the buckle structure, such that the fastening belt body can wind around the object to be fastened and the buckle structure can bond to the object to be fastened, whereby the object to be fastened is folded, wrapped, and secured, for the convenience of discarding or carrying around. Because the fastening belt body is elastic, the fastening belt not in use is in a free state and will not fold, such that it no longer needs to dispose an adhesive tape layer. On one hand the softness of the fastening belt is improved and correspondingly the wear-comfort of the hygienic product provided with the fastener belt is improved. On the other hand, the structure and the manufacturing process of the fastening belt are simplified and correspondingly the cost is reduced.



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FASTENING BELT AND HYGIENIC PRODUCTS COMPRISING SAME

TECHNICAL FIELD

The present invention belongs to the technical field of disposable hygienic products, and in particular, to a fastening belt and a hygienic product comprising the same.

BACKGROUND

Diapers or training pants are disposable products and commonly have a fastening belt disposed at the back waist thereof for the convenience of wrapping the used diapers or training pants before discarding. As shown in FIG. 1, the existing fastening belt is a Z-type folded composite adhesive tape comprising a lifting yoke 11 and a fastening belt body 12, wherein the fastening belt body 12 comprises a first unit 121, a second unit 122, and a third unit 123. The first unit 121 is bonded to the second unit 122 and the second unit 122 is bonded to the third unit 123 both by an adhesive tape layer 124, and the third unit 123 is bonded to the diaper or training pants. A fastening belt not in use presents a Z-type folded state, and when put into use, the first unit 121 and the second unit 122 folded with each other, and the second unit 122 and the third unit 123 folded with each other are stretched out by pulling the lifting yoke 11, thereby stretching the whole fastening belt. The stretched fastening belt will be about twice the initial size in the folded state.

However, this fastening belt has a complex structure and production process, resulting in high production and manufacture cost. Furthermore, the adhesive tape layer 124 is usually made of acrylic plastics and has a relatively hard texture making the diapers or training pants less comfortable, the fastening belt also presents a folded state and is relatively thick when the diapers or training pants are worn, making them even more uncomfortable.

Therefore, there is an urgent need for a fastening belt and a hygienic product comprising the fastening belt to solve the above technical problems.

SUMMARY

With regard to the above drawbacks existing in the prior art, the present invention provides a fastening belt and a hygienic product comprising the fastening belt, to at least partially solve the problem of the complex structure and process of the existing fastening belts, and the problem of poor wear-comfort of the hygienic products.

The present invention provides a fastening belt comprising a buckle structure and an elastic fastening belt body, wherein the fastening belt body comprises a first surface and a second surface disposed opposite of each other, the first end of the fastening belt body is secured through the first surface to an object to be fastened, the second end of the fastening belt body is a free end, and the buckle structure is secured to the second surface of the fastening belt body; and after the fastening belt body is stressed, it can stretch the buckle structure, and the buckle structure can then bond to the object to be fastened. Preferably, the buckle structure is adjacent to the second end of the fastening belt body.

Preferably, the buckle structure has a length of 10 to 30 mm in the stretch direction in the non-stretched state.

Preferably, a direction vertical to the stretch direction of the fastening belt body in the plane wherein the fastening belt body is located is considered a first direction, and the buckle structure completely covers the fastening belt body in the first direction.

Preferably, the buckle structure comprises hooks provided with gaps and/or holes, and the direction of the gaps is the same as the first direction.

Furthermore, the buckle structure further comprises a substrate formed integrally with the hook.

Preferably, there are multiple gaps and/or holes, the length of at least some of the gaps is less than the width of the fastening belt body in the first direction, and adjacent gaps and/or holes are disposed alternately along the stretch direction of the fastening belt body.

Preferably, the gaps and/or the holes have a length less than or equal to 20 mm in the first direction.

Preferably, the fastening belt body has a single-layer structure or a composite film-layer structure.

Preferably, the fastening belt body with a single-layer structure has a length in the stretch direction thereof in the non-stretched state greater than that of the fastening belt body with a composite film-layer structure in the stretch direction thereof in the non-stretched state.

Preferably, the fastening belt body has a single-layer structure and the material of the fastening belt body is elastic nonwoven cloth.

Preferably, the fastening belt body has a length of 60 to 80 mm in the stretch direction in the non-stretched state.

Preferably, the fastening belt body has a composite film-layer structure comprising a first nonwoven cloth layer, an elastic film layer and a second nonwoven cloth layer disposed successively in a stack.

Preferably, the fastening belt body has a length of 40 to 70 mm in the stretch direction in the non-stretched state.

The present invention further provides a hygienic product comprising the fastening belt, comprising an object to be fastened and the fastening belt as aforementioned.

The present invention has the following beneficial effects.

In the fastening belt and the hygienic product comprising the fastening belt as provided herein, a buckle structure is disposed on an elastic fastening belt body, and one end of the fastening belt body is secured to an object to be fastened. When the other end of the fastening belt body is under stress, the fastening belt body can be drawn and stretched, drawing and stretching the buckle structure, such that the fastening belt body can wind around the object to be fastened and the buckle structure can bond to the object to be fastened, whereby the object to be fastened is folded, wrapped, and secured, for the convenience of discarding or carrying around. Because the fastening belt body is elastic, the fastening belt not in use is in a free state and will not fold, such that it no longer needs to dispose an adhesive tape layer. On one hand the softness of the fastening belt is improved and correspondingly the wear-comfort of the hygienic product provided with the fastener belt is improved. On the other hand, the structure and the manufacturing process of the fastening belt are simplified and correspondingly the cost is reduced.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic view of a breakdown structure of the existing fastening belt;

FIG. 2a is top view of a fastening belt provided in an example of the present invention in a non-stretched state;

FIG. 2b is top view of a fastening belt provided in an example of the present invention in a stretched state;

FIG. 3 is schematic cross section 1 of a fastening belt provided in an example of the present invention; and

FIG. 4 is schematic cross section 2 of a fastening belt provided in an example of the present invention.

Reference numbers of the accompanying drawings:

11. lifting yoke	12. fastening belt body	121. first unit
122. second unit	123. third unit	124. adhesive tape layer
21. buckle structure	22. fastening belt body	23. glue
221. first surface	222. second surface	223. first end
224. second end	211. hook	212. gap
213. substrate	225. first nonwoven cloth layer	226. elastic film layer
227. second nonwoven cloth layer		

DETAILED DESCRIPTION

Technical solutions of the present invention will be described clearly and completely below in combination with the accompanying drawings of the present invention, and it is apparent that the described examples are only some, rather than all of the examples of the present invention. All other examples obtained by those of ordinary skill in the art based on the examples of the present invention, without making creative efforts, shall belong to the protection scope of the present invention.

As shown in FIG. 2a to FIG. 4, the present invention provides a fastening belt comprising a buckle structure 21 and a fastening belt body 22, wherein the fastening belt body 22 comprises a first surface 221 and a second surface 222 disposed opposite of each other. The fastening belt body 22 is elastic, so that it can be drawn and

stretched under stress and can return to its shape after it is released. The first end 223 of the fastening belt body 22 is secured to an object to be fastened (not shown) through the first surface 221, the second end 224 of the fastening belt body 22 is a free end, and the buckle structure 21 is secured to the second surface 222 of the fastening belt body 22. After the fastening belt body 22 is stressed, it can stretch the buckle structure 21, and the buckle structure 21 can then bond to the object to be fastened.

In the fastening belt as provided herein, the buckle structure 21 is disposed on the elastic fastening belt body 22, and one end of the fastening belt body 22 is secured to the object to be fastened. When the other end of the fastening belt body 22 is under stress, the fastening belt body 22 can be drawn and stretched, drawing and stretching the buckle structure 21, such that the fastening belt body 22 can wind around the object to be fastened and the buckle structure 21 can bond to the object to be fastened, whereby the object to be fastened is folded, wrapped and secured, for the convenience of discarding or carrying around. Because the fastening belt body 22 is elastic, the fastening belt not in use is in a free state and will not fold, such that it no longer needs to dispose an adhesive tape layer. On one hand the softness of the fastening belt can be improved, and on the other hand, the structure and the manufacturing process of the fastening belt can be simplified and correspondingly the cost is reduced.

Preferably, the buckle structure 21 is adjacent to the second end 224 of the fastening belt body 22. Because the second end 224 of the fastening belt body 22 is a free end and the buckle structure 21 is disposed in the vicinity of the second end 224 of the fastening belt body 22, when the fastening belt body 22 is stretched, the buckle structure 21 has a wider range of movement with respect to the object to be fastened and it is more convenient to use.

As shown in FIG. 2a and FIG. 2b, the stretch direction of the fastening belt body 22 and the buckle structure 21 is the x-direction in the figure, and the direction vertical to the stretch direction of the fastening belt body 22 in the plane wherein the fastening belt body 22 is located is considered the first direction, i.e., the y-direction in the figure.

As shown in FIG. 2a, the buckle structure 21 has a length of L_1 in the stretch direction thereof in the non-stretched state, wherein the stretch direction of the buckle

structure 21 is the same as that of the fastening belt body 22. Preferably, L_1 may be 10 to 30 mm.

Preferably, the buckle structure 21 completely covers the fastening belt body 22 in the first direction (i.e., the y-direction), such that the area of the buckle structure 21 is relatively large, and after the object to be fastened is strapped and wrapped by the fastening belt body 22, the buckle structure 21 can bond to the object to be fastened more firmly.

As shown in FIG. 3 and FIG. 4, the buckle structure 21 comprises hooks 211. In order to improve ductility of the buckle structure 21 and reduce the internal stress of the buckle structure 21, and to reduce the risk of the four corners of the buckle structure 21 from coming off the fastening belt body 22, gaps 212 are disposed on the hooks 211.

In the example of the present invention, as shown in FIG. 2a and FIG. 2b, the hooks 211 are provided with gaps 212 in the y-direction, and the direction of the gap 212 is the same as the first direction. When the buckle structure 21 is in the stretched state (as shown in FIG. 2b), the gaps 212 are drawn and deformed in the x-direction, and thereby form holes. The gap 212 can be formed through a mold-cutting process.

As shown in FIG. 2a, the gap 212 has a length of L_2 , the fastening belt body 22 has a width of W in the first direction, multiple gaps 212 are present, and at least some of the gaps 212 have a length L_2 less than the width W of the fastening belt body 22 in the first direction, i.e., at least some of the gaps 212 do not run through the buckle structure 21 in the y-direction. In examples of the present invention, the length L_2 of each gap 212 is less than the width W of the fastening belt body 22 in the first direction. Adjacent gaps 212 are disposed alternately along the stretch direction of the fastening belt body 22, such that the strength of the hook 211 can be ensured and the hook 211 can be prevented from breaking during stretching.

In order to further improve the strength of the hook 211, preferably the gap 212 has a length L_2 less than or equal to 20 mm.

It should be noted that, the hook 211 can also be provided with holes or alternatively with both gaps and holes. If the hook 211 is provided with holes, when the buckle structure 21 is in the stretched state, the holes will also be drawn and deformed in the x-direction, and the hole size will be increased correspondingly.

Preferably, the holes may be slotted holes with the length direction (i.e., the direction of the greater hole size) consistent with the first direction and the width direction (i.e., the direction of the smaller hole size) consistent with the stretch direction, such that when the fastening belt body 22 is stretched, the hook 212 can be deformed sufficiently, so as to ensure successful stretching of the buckle structure 21. The length of the slotted hole is less than the width W of the fastening belt body 22 in the first direction and is preferably less than or equal to 20 mm. Multiple slotted holes are present, and various slotted holes are disposed alternately along the stretch direction of the fastening belt body 22.

As shown in FIG. 3 and FIG. 4, the buckle structure 21 further comprises a substrate 213 formed integrally with the hook 211. One side of the substrate 213 without the hook 211 disposed thereon is attached and secured to the second surface 222 of the fastener body 22, thereby to fixedly connect the buckle structure 21 to the fastener body 22. In the examples of the present invention, the substrate 213 can be bonded to the fastener body 22 through the glue 23 or alternatively fixedly connected to the fastener body 22 through a hot pressing process.

The fastening belt body 22 may have a single-layer structure, or alternatively a composite film-layer structure. Structures of the fastening belt body 22 with a single-layer structure and the fastening belt body 22 with a composite film-layer structure will be described below in detail in combination with FIG. 3 and FIG. 4 respectively.

As shown in FIG. 3, the fastening belt body 22 has a single-layer structure and the material of the fastening belt body 22 is elastic nonwoven cloth.

As shown in FIG. 2a, the fastening belt body 22 has a length of L_3 in the stretch direction thereof in the non-stretched state, and preferably L_3 may be 60 to 80 mm for the fastening belt body 22 with a single-layer structure. For the fastening belt body 22 with a single-layer structure, preferably the fastening belt body 22 has a length L_3 of 62 mm in the stretch direction thereof in the non-stretched state and the buckle structure 21 has a length L_1 of 15 mm in the stretch direction thereof in the non-stretched state.

As shown in FIG. 4, the fastening belt body 22 has a composite film-layer structure comprising a first nonwoven cloth layer 225, an elastic film layer 226, and a second nonwoven cloth layer 227 disposed successively in a stack, wherein the elastic

film layer 226 is located between the first nonwoven cloth layer 225 and the second nonwoven cloth layer 227, and preferably the material of the elastic film layer 226 may be resin or rubber.

Because the elastic film layer 226 is disposed in the fastening belt body 22 of the composite film-layer structure and the elastic film layer 226 has a higher elasticity than that of the elastic nonwoven cloth, the fastening belt body 22 with a composite film-layer structure can be shorter than the fastening belt body 22 with a single-layer structure. Namely, the fastening belt body 22 with a single-layer structure has a length in the stretch direction thereof in the non-stretched state greater than that of the fastening belt body 22 with a composite film-layer structure in the stretch direction thereof in the non-stretched state.

Preferably, the fastening belt body 22 with a composite film-layer structure may have a length L_3 of 40 to 70 mm in the stretch direction in the non-stretched state. For the fastening belt body 22 with a composite film-layer structure, preferably the fastening belt body 22 has a length L_3 of 50 mm in the stretch direction thereof in the non-stretched state, and the buckle structure 21 has a length L_1 of 15 mm in the stretch direction thereof in the non-stretched state.

For the fastening belt body 22 with a single-layer structure, when stress of the same magnitude is applied to the fastening belt body 22, the fastening belt body 22 in which the buckle structure 21 has no gaps 212 disposed thereon may be stretched from 70 mm to 110 mm, and the fastening belt body 22 in which the buckle structure 21 has gaps 212 disposed thereon may be stretched from 70 mm to 140 mm.

For the fastening belt body 22 with a composite film-layer structure where the elastic film layer 226 is spunbonded nonwoven cloth - SIS (styrene - isoprene - styrene) elastic film - spunbonded nonwoven cloth, ductility data obtained for the fastening belt body 22 is detailed in Table 1.

Table 1

Parameters detected	Unit	Direction	Numerical value
Grammage	gsm	NA	100
100% load at a certain elongation	N/50mm	CD	6
Elongation under 10 N acting force	%	CD	105
Elongation at break	%	CD	300

It can be seen from Table 1 that, the fastening belt body 22 with a grammage of 100 g/m² is subjected to a force of 6 N per 50 mm width when the length thereof is drawn to twice the initial length thereof; the length is increased by 105% under the action of a 10 N tensile force; and when the length is drawn to 4 times the initial length, the fastening belt body 22 breaks.

The present invention further provides a hygienic product comprising an object to be fastened and the fastening belt as aforementioned.

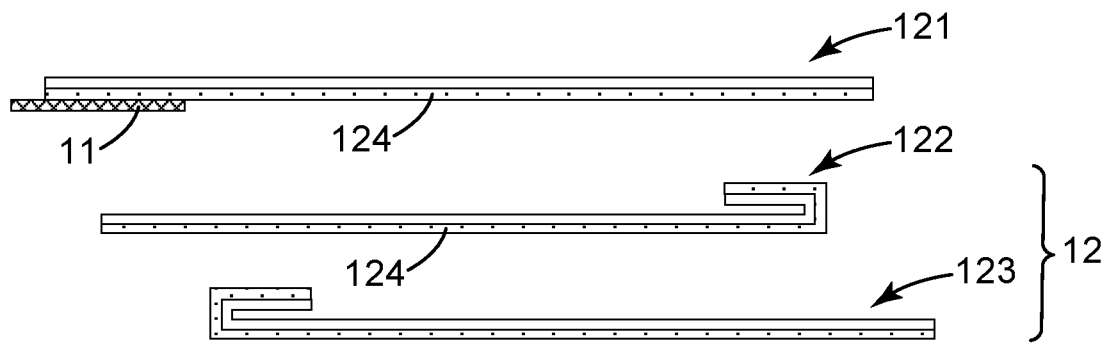
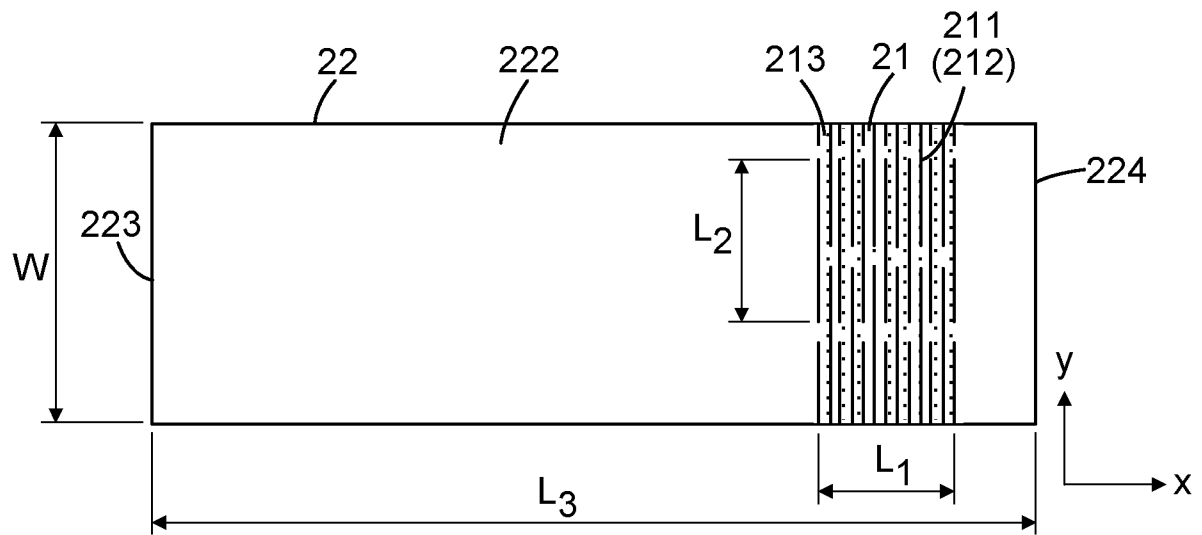
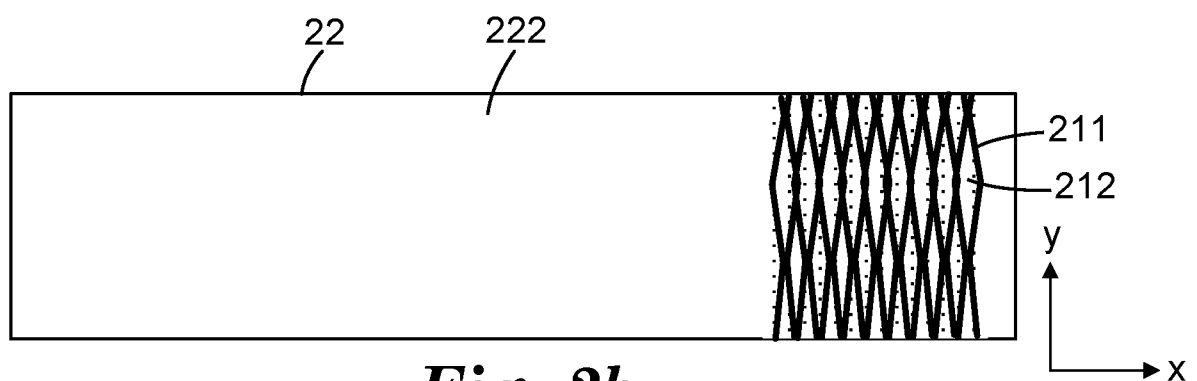
In the examples of the present invention, the hygienic product is a disposable hygienic product, i.e., an article for daily use that is discarded after the first use, directly contacts the human body, and is used for the purpose of hysiological hygiene or health care (antisepsis and bacteriostasis) of the human body, and particularly the hygienic product may be protective underwear, a urine isolation pad, a diaper and the like. However, it can be known by those skilled in the art that, a fastening belt mainly exerts functions of fastening and strapping, and thus it can also be applied to any product requiring fastening.

It can be understood that, the above embodiments are only exemplary embodiments employed for illustration of principles of the present invention, and do not limit the present invention. For those of ordinary skill in the art, various variations and modifications may be made without departing from the spirit and essence of the present invention, which variations and modifications are also considered as falling within the protection scope of the present invention.

CLAIMS

1. A fastening belt, wherein, the fastening belt comprises: a buckle structure and an elastic fastening belt body, wherein the fastening belt body comprises a first surface and a second surface disposed opposite of each other, the first end of the fastening belt body is secured through the first surface to an object to be fastened, the second end of the fastening belt body is a free end, and the buckle structure is secured to the second surface of the fastening belt body; and
after the fastening belt body is stressed, it can stretch the buckle structure, and the buckle structure can then bond to the object to be fastened.
2. The fastening belt of claim 1, wherein, the buckle structure is adjacent to the second end of the fastening belt body.
3. The fastening belt of claim 1, wherein, the buckle structure has a length of 10 to 30 mm in the stretch direction thereof in the non-stretched state.
4. The fastening belt of claim 1, wherein, a direction vertical to the stretch direction of the fastening belt body in the plane wherein the fastening belt body is located is considered a first direction, and the buckle structure completely covers the fastening belt body in the first direction.
5. The fastening belt of claim 4, wherein, the buckle structure comprises hooks provided with gaps and/or holes, and the direction of the gaps is the same as the first direction.
6. The fastening belt of claim 5, wherein, the buckle structure further comprises a substrate formed integrally with the hook.
7. The fastening belt of claim 5, wherein, there are many gaps and/or holes, the length of at least some of the gaps is less than the width of the fastening belt body in the first direction, and adjacent gaps and/or holes are disposed alternately along the stretch direction of the fastening belt body.

8. The fastening belt of claim 7, wherein, the length of the gaps and/or the holes is less than or equal to 20 mm in the first direction.
9. The fastening belt of any one of claims 1 to 8, wherein, the fastening belt body has a single-layer structure or a composite film-layer structure.
10. The fastening belt of claim 9, wherein, the fastening belt body with a single-layer structure has a length in the stretch direction thereof in the non-stretched state greater than that of the fastening belt body with a composite film-layer structure in the stretch direction thereof in the non-stretched state.
11. The fastening belt of claim 10, wherein, the fastening belt body has a single-layer structure and the material of the fastening belt body is elastic nonwoven cloth.
12. The fastening belt of claim 11, wherein, the fastening belt body has a length of 60 to 80 mm in the stretch direction thereof in the non-stretched state.
13. The fastening belt of claim 10, wherein, the fastening belt body has a composite film-layer structure comprising a first nonwoven cloth layer, an elastic film layer, and a second nonwoven cloth layer disposed successively in a stack.
14. The fastening belt of claim 13, wherein, the fastening belt body has a length of 40 to 70 mm in the stretch direction thereof in the non-stretched state.
15. A hygienic product, wherein, the hygienic product comprises an object to be fastened and the fastening belt of any one of claims 1 to 14.

**Fig. 1****Fig. 2a****Fig. 2b**

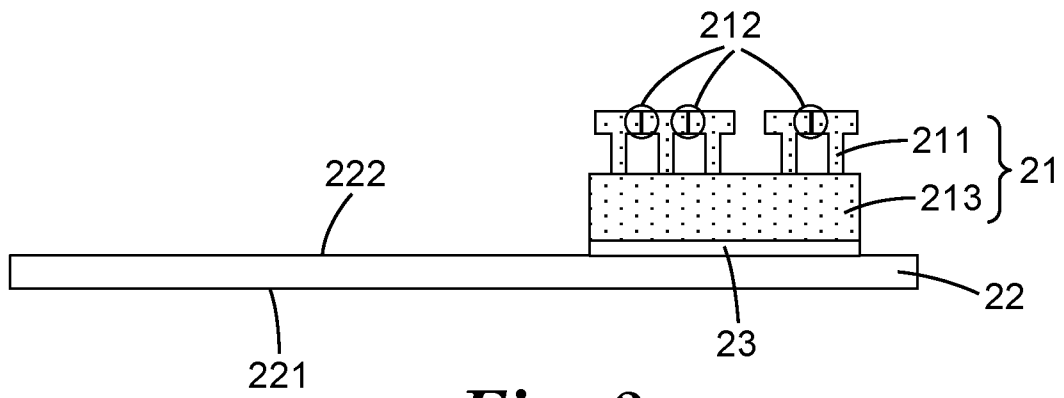


Fig. 3

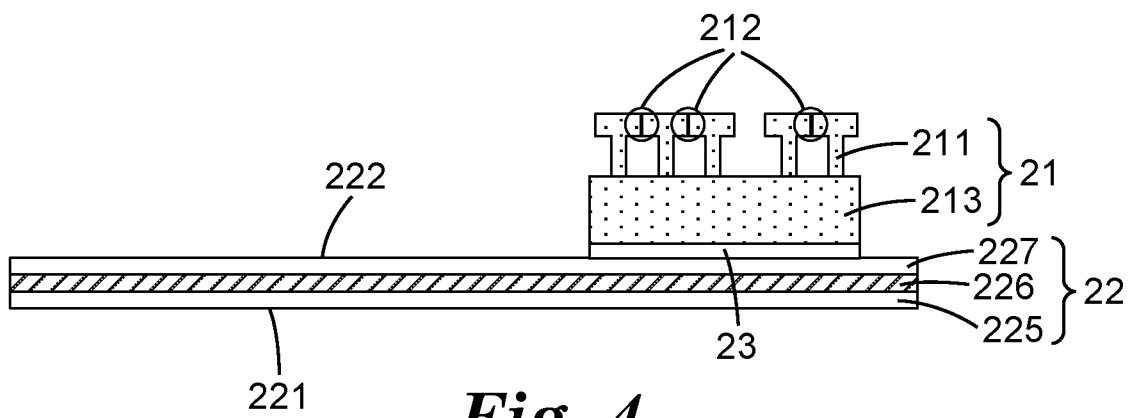


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2019/051002

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61F13/551 A61F13/64
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)

A61F

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 practicable, search terms used)

EP0-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	paragraphs [0033], [0034]; figures 1-7	3,8, 12-14
Y	----- US 5 691 034 A (KRUEGER DENNIS L [US] ET AL) 25 November 1997 (1997-11-25) column 1, line 16; example 1	13
X	----- US 2007/149942 A1 (ARCO JUDITH A [US] ET AL) 28 June 2007 (2007-06-28)	1,2,4-7, 9-11,15
Y	paragraphs [0021], [0022], [0025], [0029], [0030]; figures 1-8a	3,8, 12-14
X	----- WO 2006/130053 A1 (SCA HYGIENE PROD AB [SE]; ANDERSSON MIKAEL [SE] ET AL.) 7 December 2006 (2006-12-07) page 9, lines 4-16; figures 1-8c page 4, lines 4-8	1,2,4-7, 15

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

☒ See patent family annex.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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