(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 228 741 B9**

(12) **CORRECTED EUROPEAN PATENT SPECIFICATION**

(15) Correction information:
Corrected version no 1 (W1 B1)
Corrections, see
Claims EN 1

(48) Corrigendum issued on:
04.08.2010 Bulletin 2010/31

(45) Date of publication and mention of the grant of the patent:
10.02.2010 Bulletin 2010/06

(21) Application number: **00961165.8**

(22) Date of filing: **21.09.2000**

(51) Int Cl.:
A61F 13/494 *(2006.01)*

(86) International application number:
PCT/JP2000/006480

(87) International publication number:
WO 2001/021124 (29.03.2001 Gazette 2001/13)

(54) DISPOSABLE ABSORBENT WEARING ARTICLE AND PROCESS FOR PLACEMENT OF ELASTIC MEMBERS ASSOCIATED WITH LEG-HOLES ON THE ARTICLE

ABSORBIERENDER TRAGBARER WEGWERFARTIKEL UND VERFAHREN ZUM AUFBRINGEN ELASTISCHER BEINABSCHLÜSSE AUF DEN ARTIKEL

ARTICLE ABSORBANT JETABLE A PORTER ET PROCEDE DE PLACEMENT SUR LEDIT ARTICLE D'ELEMENTS ELASTIQUES AU NIVEAU DES JAMBES

(84) Designated Contracting States:
DE FR GB NL SE

(30) Priority: **21.09.1999 JP 26769199**
07.09.2000 JP 2000272169

(43) Date of publication of application:
07.08.2002 Bulletin 2002/32

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Description

TECHNICAL FIELD

[0001] This invention relates to disposable absorbent wearing articles such as a diaper, a pad for incontinent or a sanitary napkin and a process for placement of elastic members associated with leg-holes on such articles.

BACKGROUND ART

[0002] The invention relating to such articles, particularly to such article provided along respective thigh-surrounding zones with a plurality of rubber threads as elastic members associated with leg-holes and the invention relating to a process for placement of these rubber threads are disposed in Japanese Patent Application Nos. 1992-122257A and 1992-317650A. The process for making the disposable diaper is generally classified into a process according to which the thigh-surrounding zones of individual finished products extend in the machine direction (so-called lengthwise or end-to-end arranged process) and a process according to which the thigh-surrounding zones of individual finished products extend in the direction orthogonal to the machine direction (so-called laterally running or side-by-side arranged process). The inventions disclosed in the above-cited Applications are classified into the former process. Generally, the former process is suitable for making a so-called open-type diaper having its front and rear waist regions connected to each other immediately before actual use to meet requirements for mass-production of the diaper at desired high velocity. The latter process, on the other hand, is suitable for making a so-called pants-type or pull-on-type diaper having its front and rear waist regions previously connected to each other. The invention relating to the latter process in which a plurality of elastic members are preferably placed along each of the thigh-surrounding zones is disclosed in Japanese Patent Application No. 1991-33201A.

[0003] The above-cited Japanese Patent Application Nos. 1992-122257A and 1992-317650A disclose the process for placement of continuous elastic members associated with the leg-holes. According to this process, a continuous web as a component material for the diaper is provided along its transversely opposite side edges with adhesive zones arranged intermittently in the longitudinal direction, then elastic members associated with the respective leg-holes, each comprising a plurality of elastic elements, are fed under tension onto the respective adhesive zones and secured thereto so that the elastic members associated with the leg-holes may describe generally sinusoidal curves. According to this process of prior art, these elastic members associated with the leg-holes are forcibly traversed against tensile force of these elastic members so as to extend across the continuous web. Consequently, the elastic members associated with the leg-holes present a tensile stress higher in a generally middle zone than the remaining zone in a crotch region of the diaper.

[0004] Placement of the elastic members associated with the leg-holes in this manner causes these elastic members to present a tensile stress higher in the middle zone than in the remaining zone, resulting in that gathers formed in the middle zone of the crotch region do not easily extend as the diaper is worn. Gaps between the wearer's skin and the gathers may cause leak of body fluids. Additionally, it is likely that the diaper as a whole might shift from its proper position and a liquid-absorbent core might be twisted and deformed as the crotch region of the diaper shifts due to a movement of the wearer's thighs. These factors also may cause leak of body fluids and, in addition, might create a feeling of discomfort against the wearer. In case of a diaper provided on its side flaps on which the elastic members associated with the leg-holes are placed and these side flaps are provided, in turn, with elastic barrier flaps, there is an additional anxiety that relatively high tensile stress of the elastic members associated with the leg-holes might prevent the barrier flaps from rising as sufficiently high as expected.

[0005] US-A-5779689 discloses a disposable diaper comprising a liquid-impervious outer sheet, defining a narrower crotch region between two wider end or belt regions, an absorbent pad, fastening members for closing the diapers, and elastic members attached under tension to the impervious sheet on both sides of the absorbent pad, substantially over the whole length of the impervious sheet, with a higher tension in the crotch region than in the end region. In the two end regions, the diaper has sections converging in the direction of the transverse edges of the impervious sheet, so that the elastic members form an elastic barrier which practically surrounds the absorbent pad and provide the impervious sheet both with a lengthwise elasticity in the crotch region and a transverse elasticity in the end regions.

[0006] It is an object of this invention to solve such problems as have been described above in disposable absorbent wearing articles such as a disposable diaper.

[0007] According to one embodiment of this invention, there is provided a disposable absorbent wearing article having a longitudinal direction, a transverse direction orthogonal to said longitudinal direction, a front waist region, a rear waist region and a crotch region between said front and rear waist regions, and comprising an absorbent structure including a liquid-pervious topsheet, a liquid-impervious backsheet, a liquid-absorbent core disposed therebetween, a pair of side flaps extending outward from transversely opposite side edges of said core and, a plurality of elastic members associated with each leg-hole, said elastic members being placed on cutouts formed in said side flaps to surround the thighs of a wearer, said article being **characterised in that**:- said elastic members associated with each leg-hole are converged substantially into a respective single bundle along a first elastic zone each extending over a middle zone of said

crotch region and are progressively diverged from said first elastic zone toward second and third elastic zones extending from said first elastic zones to side edges of said front and rear waist regions; and said elastic members have a tensile stress not higher in said first elastic zone than in said second and third elastic zones.

[0008] According to another embodiment of this invention, there is provided a process for placement of elastic members associated with leg-holes on disposable absorbent wearing article, comprising the steps of:

(a) feeding a first continuous web as a component of said article in its longitudinal direction at a given rate and at the same time continuously coating said first continuous web along its transversely opposite side edges extending in its longitudinal direction with hot melt adhesive to form first and second adhesive zones;
(b) feeding first and second continuous elastic members associated with the leg-holes of said article, each comprising a plurality of continuous elastic members spaced one from another and under tension, onto said first and second adhesive zones, respectively; and
(c) cutting said first continuous web along lines extending in its transverse direction across respective zones of said first and second continuous elastic members together with said first and second continuous elastic members so that thereupon said zones contract;

characterised in that, in step (b), said first and second continuous elastic members are fed in such a manner that said first and second continuous elastic members extend across said first and second adhesive zones of said first continuous web beyond respective inner and outer side edges of said first and second adhesive zones and respectively describe substantially sinusoidal curves about said respective adhesive zones, respective first other zones of said first and second continuous elastic members lying on said first and second adhesive zones being fixed to said first and second adhesive zones, respectively, and respective second other zones of said first and second continuous elastic members extending beyond said inner side edges of said first and second adhesive zones being contractibly shifted to said first and second adhesive zones so as to be fixed to said first and second adhesive zones, respectively, and so that said first and second continuous elastic members are respectively converged substantially in a single bundle in said respective second zones while said first and second continuous elastic members are progressively diverged from said respective second zones toward said respective first zones; and so that a tensile stress of said respective second zones is not higher than that of said respective first zones.

[0009] The invention includes the following embodiments:

[0010] The core has a stiffness of 1-30gf.com (10-300mN.cm) in the longitudinal and transverse directions.

[0011] The elastic members associated with the leg-holes are respectively spaced in the first elastic zones from the side edges of the core at least by 10mm.

[0012] The process further includes the steps of placing liquid-absorbent cores on given zones on the continuous web defined between the first and second adhesive zones at given intervals in the longitudinal direction of the web and placing and bonding a second continuous web upon and to the first continuous web so as to cover the liquid-absorbent cores.

[0013] The first and second adhesive zones are formed by continuously coating the transversely opposite side edges of the first continuous web with hot melt adhesive so as to describe a plurality of spirals extending to the longitudinal direction of the first continuous web.

[0014] The first continuous web is made of liquid-impervious material and the second continuous web is made of liquid-pervious material.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

Fig. 1 is a partially cutaway perspective view showing a disposable diaper;
Fig. 2 is a plan view illustrating relative positions of a backsheet, a core and elastic members associated with leg-holes;
Fig. 3 is a diagram schematically illustrating a process for making the diaper; and
Fig. 4 is a partially-enlarged diagram illustrating steps III and IV in Fig. 3.

PREFERRED EMBODIMENTS OF THE INVENTION

[0016] Embodiments of this invention will be described in more details with reference to the accompanying drawings.

(1) A diaper as one embodiment of a disposable absorbent wearing article according to this invention:

[0017] Referring to Fig. 1, a diaper 1 as a specific embodiment of a disposable absorbent wearing article has a longitudinal center line 2 and provided with an absorbent structure 1A. The diaper 1 has a longitudinal direction and a transverse direction orthogonal to this longitudinal direction. The absorbent structure 1A has its side halves symmetric about the longitudinal center line 2, and comprises a liquid-pervious topsheet 3, a liquid-impervious backsheet 4, a liquid-absorbent core 5 interposed between these sheets 3, 4, a pair of side flaps 6 and a pair of end flaps 7, both pairs being formed by portions of the top- and backsheets 3, 4 extending outward beyond a peripheral edge of the core 5. The diaper 1 is composed

of a front waist region 8, a rear waist region 9 and a crotch region 10. Though not shown, the side flaps 6 and/or the end flaps 7 are highly flexible and may be formed also by a suitable material other than the material for the topsheet 3 and/or the backsheet 4. In the crotch region 10, the side flaps 6 are formed with cutouts 11 to define leg-holes. Along curved side edges of these cutouts 11, elastic members 12 having rubber elasticity and comprising a plurality of elastic string or strands are secured under extension between the top- and backsheets 3, 4 by means of a hot melt adhesive 70 as will be described later. In the front and rear waist regions 8, 9, the end flaps 7 are also provided with elastic members 13A, 13B having rubbery elasticity. These elastic members 13A, 13B are also secured under extension to the top- and backsheets 3, 4 by means of a hot melt adhesive (not shown). It should be understood that, in the diaper 1, the elastic members 13A, 13B may be eliminated in one of the front and rear waist regions 8, 9.

[0018] The topsheet 3 is provided on its transversely opposite side edges with barrier flaps 15 normally biased by elastic members 14 under extension. When the diaper 1 is worn and bent toward front and rear directions contraction of the elastic members 14 functions to uprise the barrier flaps 15 on the upper surface of the topsheet 3 and prevents bodily discharges on the topsheet 3 from flowing outward of the diaper and leaking sideways. The barrier flaps 15 have proximal edges 15a and distal edges 15b wherein the proximal edges 15a are joined between the respective side edges of the core 5 and the elastic members 12 by means of well known joining means(not shown) such as a hot melt adhesive or heat-welding. While longitudinally opposite ends of the barrier flaps 15 are collapsed outward away from the center line 2 and bonded to the topsheet 3 in such a collapsed state in Fig. 1, it is also possible to collapse these ends toward the center line 2 and join them to the topsheet 3 as well.

[0019] The core 5 is so-called semi-rigid and interposed in a substantially fixed state between the top- and backsheets 3, 4. As a means for such fixation, the well known hot melt adhesive coating in an appropriate pattern (not shown) is preferably used. In the longitudinal direction as well as in the transverse direction of the diaper 1, the core 5 preferably has a stiffness of 1 - 30gf·cm (10 - 300mN·cm) as measured in accordance with JIS P-8125 so that the elastic members may present a desired tensile stress.

[0020] Fig. 2 is a plan view illustrating relative positions of the backsheet 4, the core 5 and the respective elastic members 12, 14 in the diaper 1.

[0021] A plurality of the elastic members 12 are converged substantially in a single bundle in a middle zone (first elastic zone) S of the crotch region 10 and progressively diverged from this middle zone S toward front and rear side edge zones (second and third elastic zones) F, B in order to assure that the tensile stress in the middle zone S is not higher than that in the front and rear side edge zones F, B. The description "..tensile stress in the middle zone S is not higher..." used herein means that the tensile stress in the middle zone S is substantially equal to or lower than that in the front and rear side edge zones F, B. Under this requirement, length of the middle zone S is at least 30mm, preferably 50 - 150mm; tensile stress in the middle zone S is at least 30g/25mm width (300mN/25mm width), preferably 50 - 200g/25mm width (500 - 2000mN); tensile stress in the front and rear side edges F, B is at least 50g/25mm width, preferably 80 - 230mm width (800 - 2300mN/25mm width). The values of the tensile stress are those obtained on test pieces with 25mm in width cut off from the side flap 6 mainly in the elastic members 12 and stretched by 88.9%. Distance D between the elastic members 12 and the side edge of the core 5 in the middle zone S is at least 10mm, preferably 15 - 50mm. The maximum dimension between each pair of the adjacent elastic members 12 in the front and rear side edge zones F, B is 3 - 15mm.

[0022] On the transversely opposite side edges of the rear waist region 9, the absorbent structure 1A is provided with tape fastener 17 as shown in Fig. 1 to connect the rear waist region 9 to the front waist region 8 so that the absorbent structure 1A can be used as the diaper 1.

[0023] While contraction of the elastic members 12 in the diaper 1 generates a plurality of gathers along the middle zones S as well as along the front and rear side edge zones F, B, the tensile stress of the elastic members 12 along the middle zones S is not so high that the number of the gathers and the depth of the gathers trough are equal to or less than those in the front and rear side edges zones F, B. With a consequence, the diaper 1 comes in close in contact with the wearer's skin in the wearer's crotch region without formation of any significant gap between the wearer's skin and the gathers. In this way, there is no anxiety that leak of bodily discharges might occur in the crotch region 10 of the diaper 1, in particular, beyond the middle zones S thereof.

[0024] The unique arrangement that the elastic members 12 are spaced from the respective side edges of the core 5 by the distance D along the middle zones S of the diaper 1 and have relatively low tensile stress advantageously restricts a possibility that contraction of the elastic members 12 in the zones S might affect the core 5 as well as the barrier flaps 15. For example, it is not apprehended that contraction of the elastic members 12 in the zones S might twist, deform or crease the core 5 or obstruct the barrier flaps 15 to uprise. Furthermore, there is no anxiety that the absorbent structure 1A might be displaced from its proper position by following stretch or contraction of the elastic members 12 due to a movement of the wearer's legs.

(2) A process for placement of the elastic members associated with leg-holes on the diaper as a specific embodiment of the disposable absorbent wearing article:

[0025] Fig. 3 is a process diagram schematically illustrating a process for making the diaper 1 provided with

the absorbent structure 1A. In the step I, first web 504 made of a continuous liquid-impervious plastic film is supplied to the process at a given rate from the left as viewed in the diagram.

[0026] In the step II, a plurality of streaks of a hot melt adhesive 70 are discharged from nozzles 69A, 69B onto transversely opposite side edges of the first web 504 drawing a spiral pattern and providing a first adhesive zone 71A and a second adhesive zone 71B.

[0027] In the step III, a plurality of first continuous elastic members 512A and a plurality of second continuous elastic members 512B are fed under extension, by first and second traverse means 70A, 70B reciprocating in a direction orthogonal to the direction in which the first web 504 is being fed, onto the first and second adhesive zones 71A, 71B of the first web 504 so that the respective elastic members may be kept spaced from one another. The first and second continuous elastic members 512A, 512B fed in this manner extend across the respective adhesive zones 71A, 71B beyond respective inner side edges 72A, 72B and respective outer side edges 73A, 73B of the first and second adhesive zones 71A, 71B so as to describe substantially sinusoidal curves along the respective adhesive zones 71A, 71B. Respective first zones 74A, 74B of the first and second continuous elastic members 512A, 512B associated with the leg-holes lying on the respective adhesive zones 71A, 71B are fixed to these adhesive zones 71A, 71B and respective second zones 76A, 76B of the first and second continuous elastic members 512A, 512B associated with the leg-holes extending outward beyond the respective inner side edges 72A, 72B of the adhesive zones 71A, 71B are contractibly shifted toward the respective adhesive zones 71A, 71B so that these second zones 76A, 76B may be fixed to the respective adhesive zones 71A, 71B. The second zones 76A, 76B are converged in single bundles, respectively.

[0028] In the step IV, absorbent cores 505 are disposed on the first web 504 in such zones as defined at given intervals in the longitudinal direction of the first web 504 and a plurality of elastic members 513 associated with the waist-hole extending in the transverse direction of the first web 504 are bonded in an elongated state to the first web 504 in the zones defined between each pair of the adjacent cores 505, 505.

[0029] In the step V, a second web 503 formed of continuous liquid-pervious sheet is placed upon and bonded to the first web 504 so as to cover the cores 505 and the elastic members 513 associated with the waist-hole to obtain a laminate 501A. Though not illustrated, the first web 504 and the second web 503 may be bonded to each other using a hot melt adhesive or welding technique.

[0030] In the step VI, elastically stretchable first and second continuous flap members 515A, 515B are bonded, while applying tension in the advancing direction of the second web 503 being fed, to the upper surface of the second web 503 along transversely opposite side edges of the laminate 501A. Each of the first and second continuous flap members 515A, 515B comprises a narrow web 81 having transversely opposite side edges 515a and 515b. The one side edge 515b is provided with elastic members 514 bonded under extension and the other side edge 515a is secured to the second web 503. Tape fasteners 517A, 517B are attached to the laminate 501A in given zones along its transversely opposite side edges.

[0031] In the step VII, the side edges of the laminate 501A are cut off in a semicircular shape along the first and second continuous elastic members 512A, 512B associated with the leg-holes. Then the laminate 501A is cut along lines 82 transversely extending between each pair of the adjacent cores 505, 505 so as to bisect a plurality of elastic members 513 associated with the waist-hole in two direction of the second web 503 being fed and thereby individual diapers 1 are obtained.

[0032] Fig. 4 is a scale-enlarged diagram schematically illustrating the steps III and IV of Fig. 3. Referring to Fig. 4, imaginary lines indicate a manner in which the first and second continuous elastic members 512A, 512B associated with the leg-holes are fed by the respective traverse means 70A, 70B and solid lines indicate state of these members 512A, 512B immediately after they have been fed.

[0033] The first and second continuous elastic members 512A, 512B are fed so that these members 512A, 512B extend across the first and second adhesive zones 71A, 71B, respectively, beyond both the inner side edges 72A, 72B and the outer side edges 73A, 73B. After having been fed in this manner, the zones 76A, 76B extending beyond the inner side edges 72A, 72B are contractibly shifted so as to extend rectilinearly along the inner side edges 72A, 72B, respectively. The third zones 77A, 77B extending beyond the outer side edges 73A, 73B also are contractibly shifted so as to extend rectilinearly along the outer side edges 73A, 73B, respectively. These third zones 77A, 77B are also cut when the laminate 501A is cut in the step VII. These third zones 77A, 77B may be either secured or not to the first and second continuous adhesive zones 71A, 71B, respectively. If these zones 77A, 77B are secured to the adhesive zones 71A, 71B, respectively, these zones are kept to extend rectilinearly along the outer side edges 73A, 73B even after having been cut and if these zones 77A, 77B are not bonded to the adhesive zones 71A, 71B, respectively, these zones 77A, 77B further contract as these zones are cut. Figs. 1 - 3 shows the diaper 1 in which the third zones 77A, 77B have further contracted.

[0034] The main stock materials used in the process for making the article as has been described correspond to the respective members in the diaper 1 shown in Figs. 1 and 2 as follows: the first continuous web 504 and the second continuous web 503 correspond to the backsheet 4 and topsheet 3; the core 505 corresponds to the core 5; the first and second continuous elastic members 512A, 512B associated with the leg-holes correspond to the elastic members 12 associated with the leg-holes; the

fixed zones 74A, 74B of the first and second elastic members 512A, 512B associated with the leg-holes correspond to the front and back side edge zones 12F, 12B; the zones 76A, 76B of the first and second elastic members 512A, 512B extending along the inner side edges 72A, 72B of the first and second continuous adhesive zones 71A, 71B correspond to the middle side edge zones 12S of the elastic members 12 associated with the leg-holes; the third zones 77A, 77B of the first and second continuous elastic members 512A, 512B associated with the leg-holes extending along the outer side edges 73A, 73B of the first and second continuous adhesive zones 71A, 71B without being bonded to these adhesive zones 71A, 71B contract and define ends of the front and back side edge zones 12F, 12B of the elastic members 12 associated with the leg-holes; and the elastic members 513 associated with the waist-hole corresponding to the front and rear elastic members 13A, 13B associated with the waist-hole.

[0035] For the absorbent structure 1A and the diaper 1 made in the manner as has been described above, it is possible to ensure that the second zones 76A, 76B of the first and second continuous elastic members 512A, 512B associated with the leg-holes extending beyond the inner side edges 72A, 72B of the first and second adhesive zones 71A, 71B have the tensile stress decreased with respect to the initial tensile stress thereof in the course of being fed, specifically, equal to or less than the tensile stress presented by the fixed first zones 74A, 74B of the elastic members 512A, 512B, depending on the extension with which the first and second continuous elastic members 512A, 512B are fed onto the first web 504. For example, these elastic members 512A, 512B may be fed so that a stretch ratio of these elastic members 512A, 512B gradually increases as these elastic members 512A, 512B get nearer to the center line bisecting the width of the first web 504 and then the second zones 76A, 76B extending beyond the inner side edges 72A, 72B of the first and second adhesive zones 71A, 71B contract in order to achieve such effect. The elastic members 512A, 512B are converged and considerably spaced from the curved side edges of the core 505 surrounding the thighs. The diaper 1 having such first and second continuous elastic members 512A, 512B associated with the leg-holes corresponds to the diaper shown by Fig. 1 as the typical embodiment.

[0036] While this invention has been described on the basis of the disposable diaper 1 as the one embodiment, this invention is applicable also to the other disposable absorbent wearing article such as pad for incontinent or sanitary napkin. The elastic members 12 associated with the leg-holes are attached to the side flaps 6 of such article and these side flaps 6 may be formed by the topsheet 3 and/or the backsheet 4 or may be formed by a separate sheet replacing at least one of these sheets 3, 4. Furthermore, the coating pattern of the hot melt adhesive 70 for attachment of the elastic members 12, 512A, 512B associated with the leg-holes is not limited to the spiral pattern as illustrated and the other pattern such as appropriate curves or straight lines may be used. In addition, the first web 504 and the second web 503 may be coated along the side edges thereof with the adhesive in the form of many small dots which define substantially continuous adhesive zones.

[0037] The elastic members associated with the leg-holes present the tensile stress not higher along the middle side edge zones than along the front and rear side edge zones in the crotch region. Accordingly, the number as well as the depth of the gathers formed along the middle side edge zones are equal to or less than those along the front and rear side edge zones. Along the middle side edge zones, the wearing article is held in close contact with the thighs without leaving any significant gap between the wearer's skin and the gathers which might cause leak of body fluids. In spite of the arrangement that the elastic members associated with the leg-holes extending along the middle side edge zones are considerably spaced from the side edges of the core, it is not likely that stretch and contraction of the elastic members associated with the leg-holes along the middle side edges might cause the core to be twisted and/or cause the article worn to slip down along the thighs.

[0038] The process according to this invention for placement of the elastic members associated with the leg-holes allows the disposable absorbent wearing article to be continuously made in the unique manner such that the elastic members associated with the leg-holes present the tensile stress not higher along the middle side edges than along the front and rear side edges of the wearing article's crotch region.

Claims

1. A disposable absorbent wearing article (1) having a longitudinal direction, a transverse direction orthogonal to said longitudinal direction, a front waist region (8), a rear waist region (9) and a crotch region (10) between said front and rear waist regions (8,9), and comprising an absorbent structure (1A) including a liquid-pervious topsheet (3), a liquid-impervious backsheet (4), a liquid-absorbent core (5) disposed therebetween, a pair of side flaps (6) extending outward from transversely opposite side edges of said core (95) and, a plurality of elastic members (12) associated with each leg-hole, said elastic members (12) being placed on cutouts formed in said side flaps (6) to surround the thighs of a wearer,
said article (1) being **characterised in that**:-

   said elastic members (12) associated with each leg-hole are converged substantially into a respective single bundle along a first elastic zone (S) extending over a middle zone of said crotch region (10) and are progressively diverged from said first elastic zone (S) toward second and

third elastic zones (F,B) extending from said first elastic zone (S) to side edges of said front and rear waist regions (8,9); and
said elastic members (12) have a tensile stress not higher in said first elastic zone (S) than in said second and third elastic zones (F,B).

2. The article according to claim 1, wherein said elastic members (12) are respectively spaced in said first elastic zones (S) from said side edges of said core (5) at least by 10mm.

3. A process for placement of elastic members associated with leg-holes on a disposable absorbent wearing article (1), comprising the steps of:

(a) feeding a first continuous web (504) as a component of said article (1) in its longitudinal direction at a given rate and at the same time continuously coating said first continuous web (504) along its transversely opposite side edges extending in its longitudinal direction with hot melt adhesive to form first and second adhesive zones (71A, 71B);
(b) feeding first and second continuous elastic members (512A, 512B) associated with the leg-holes of said article (1), each comprising a plurality of continuous elastic members spaced one from another and under tension, onto said first and second adhesive zones (71A, 71B), respectively; and
(c) cutting said first continuous web (504) along lines extending in its transverse direction across respective zones (77A,77B) of said first and second continuous elastic members (512A,512B) together with said first and second continuous elastic members (512A, 512B) so that thereupon said zones (77A,77B) contract;

characterised in that, in step (b), said first and second continuous elastic members (512A,512B) are fed in such a manner that said first and second continuous elastic members (512A, 512B) extend across said first and second adhesive zones (71A, 71B) of said first continuous web (504) beyond respective inner and outer side edges (72A,72B; 73A, 73B) of said first and second adhesive zones (71A, 71B) and respectively describe substantially sinusoidal curves about said respective adhesive zones (71A,71B), respective first other zones (74A, 74B) of said first and second continuous elastic members (512A, 512B) lying on said first and second adhesive zones (71A,71B) being fixed to said first and second adhesive zones (71A,71B), respectively, and respective second other zones (76A, 76B) of said first and second continuous elastic members extending beyond said inner side edges (72A,72B) of said first and second adhesive zones (71A,71B) being contractibly shifted to said first and second adhesive zones (71A, 71B) so as to be fixed to said first and second adhesive zones (71A,71B), respectively, and so that said first and second continuous elastic members (512A,512B) are respectively converged substantially in a single bundle in said respective second zones (76A, 76B) while said first and second continuous elastic members (512A, 512B) are progressively diverged from said respective second zones (76A, 76B) toward said respective first zones (74A, 74B); and so that a tensile stress of said respective second zones (76A, 76B) is not higher than that of said respective first zones (74A,74B)

4. The process according to claim 3, wherein said first and second adhesive zones (71A,71B) are formed by continuously coating said transversely opposite side edges of said first continuous web (504) with hot melt adhesive so as to describe a plurality of spirals extending in the longitudinal direction of said first continuous web (504).

5. The process according to claim 3 or 4, further including the steps of placing liquid-absorbent cores (505) on given zones on said first continuous web (504) defined between said first and second adhesive zones (71A,71B) at given intervals in the longitudinal direction of said first continuous web (504); and placing and bonding a second continuous web (503) upon and to said first continuous web (504) so as to cover said liquid-absorbent cores (505).

6. The process according to claim 5, wherein said first continuous web (504) is made of liquid-impervious material and said second continuous web (503) is made of liquid-pervious material.

Patentansprüche

1. Wegwerfbares, saugfähiges Kleidungsstück (1), mit einer Längsrichtung, einer Querrichtung senkrecht zur Längsrichtung, einem vorderen Hüftbereich (8), einem hinteren Hüftbereich (9) und einem Schrittbereich (10) zwischen dem vorderen und dem hinteren Hüftbereich (8, 9), und umfassend eine saugfähige Struktur (1A), die eine flüssigkeitsdurchlässige Oberschicht (3), eine flüssigkeitsundurchlässige Rückschicht (4), einen zwischen diesen angeordneten flüssigkeitsabsorbierenden Kern (5), ein Paar seitlicher Klappen (6), die sich von zwei quer gegenüberliegenden Seitenkanten des Kerns (95) erstrekken, sowie eine Vielzahl elastischer Elemente (12) aufweist, die jedem Beinloch zugeordnet sind, wobei die elastischen Elemente (12) in Ausschnitten angeordnet sind, die in den Klappen (6) ausgebildet sind, um die Schenkel eines Trägers zu umgeben, wobei das Kleidungsstück (1) **dadurch gekennzeichnet**

ist, dass:

die elastischen Elemente (12), die dem jeweiligen Beinloch zugeordnet sind, im Wesentlichen in ein jeweiliges einziges Bündel entlang einer ersten elastischen Zone (S) zusammengefasst sind, das sich über eine Mittelzone des Schrittbereichs (10) erstreckt und fortschreitend von der elastischen Zone (S) zu einer zweiten und einer dritten elastischen Zone (F, B) abgelenkt wird, die sich von der ersten elastischen Zone (S) zu Seitenkanten des vorderen und des hinteren Hüftbereichs (8, 9) erstrecken; und
die elastischen Elemente (12) eine Zugbelastung aufweisen, die in der ersten elastischen Zone (S) nicht höher als in der zweiten und der dritten elastischen Zone (F, B) ist.

2. Kleidungsstück nach Anspruch 1, wobei die elastischen Elemente (12) in den ersten elastischen Zonen (S) von den Kanten des Kerns (5) jeweils mindestens 10 mm beabstandet sind.

3. Prozess zur Anordnung von elastischen Elementen, die Beinlöchern zugeordnet sind, auf einem wegwerfbaren, saugfähigen Kleidungsstück (1), umfassend die folgenden Schritte:

a) Vorschieben einer ersten durchgehenden Bahn (504) als eine Komponente des Kleidungsstücks (1) in ihrer Längsrichtung mit einer vorgegebenen Geschwindigkeit, und gleichzeitig durchgehend Beschichten der ersten durchgehenden Bahn (504) entlang ihrer in Querrichtung gegenüberliegenden Seitenkanten, die sich entlang ihrer Längsrichtung erstrecken, mit Heißschmelzkleber zum Ausbilden einer ersten und einer zweiten Klebezone (71A, 71 B);
b) Vorschieben eines ersten und eines zweiten elastischen Elements (512A, 512B), die den Beinlöchern des Kleidungsstücks (1) zugeordnet sind, die jeweils eine Vielzahl durchgehender elastischer Elemente umfassen, die voneinander beabstandet sind und unter Spannung stehen, auf die erste bzw. die zweite Klebezone (71A, 71 B); und
c) Schneiden der ersten durchgehenden Bahn (504) entlang Geraden, die sich in einer Richtung quer zu ihr über entsprechende Zonen (77A, 77B) des ersten und des zweiten durchgehenden elastischen Elements (512A, 512B) erstrecken, zusammen mit dem ersten und dem zweiten durchgehenden elastischen Element (512A, 512B), so dass sich hiernach die Zonen (77A, 77B) zusammenziehen;

dadurch gekennzeichnet, dass in Schritt b) das erste und das zweite durchgehende elastische Element (512A, 512B) in einer solchen Weise vorgeschoben werden, dass sich das erste und das zweite durchgehende elastische Element (512A, 512B) über die erste und die zweite Klebezone (71A, 71 B) der ersten durchgehenden Bahn (504) über entsprechende innere und äußere Seitenkanten (72A, 72B; 73A, 73B) der ersten und der zweiten Klebezone (71A, 71 B) hinaus erstrecken und jeweils im Wesentlichen sinusförmige Kurven um die jeweiligen Klebezonen (71A, 71 B) herum beschreiben, wobei entsprechende erste andere Zonen (74A, 74B) des ersten und des zweiten durchgehenden elastischen Elements (512A, 512B), die auf der ersten bzw. der zweiten Klebezone (71A, 71 B) liegen, auf dieser ersten bzw. dieser zweiten elastischen Zone (71A, 71 B) festgeklebt werden, und entsprechende zweite andere Zonen (76A, 76B) des ersten und des zweiten durchgehenden elastischen Elements, die sich über die inneren Seitenkanten (72A, 72B) der ersten und der zweiten Klebezone (71A, 71 B) hinaus erstrecken, zusammenziehend zur ersten bzw. zur zweiten Klebezone (71A, 71 B) hin verschoben werden, um so an der ersten bzw. der zweiten Klebezone (71A, 71 B) befestigt zu werden, und so dass das erste und das zweite durchgehende elastische Element (512A, 512B) jeweils im Wesentlichen zu einem einzigen Bündel in den entsprechenden zweiten Zonen (76A, 76B) zusammengeführt werden, während das erste und das zweite durchgehende elastische Element (512A, 512B) fortschreitend von den jeweiligen zweiten Zonen (76A, 76B) zu den jeweiligen ersten Zonen (74A, 74B) abgelenkt werden; und so dass eine Zugbelastung der jeweiligen zweiten Zonen (76A, 76B) nicht größer als diejenige ihrer entsprechenden ersten Zonen (74A, 74B) ist.

4. Prozess nach Anspruch 3, wobei die erste und die zweite Klebezone (71A, 71 B) durch durchgehendes Beschichten der sich quer gegenüberliegenden Seitenkanten der ersten durchgehenden Bahn (504) mit Heißschmelzkleber ausgebildet werden, um so eine Vielzahl von Spiralen zu beschreiben, die sich in der Längsrichtung der ersten durchgehenden Bahn (504) erstrecken.

5. Prozess nach Anspruch 3 oder 4, ferner mit den Schritten des Ablegens flüssigkeitsabsorbierender Kerne (505) auf vorgegebenen Zonen auf der ersten durchgehenden Bahn (504), die zwischen der ersten und der zweiten Klebezone (71A, 71 B) in vorgegebenen Intervallen in der Längsrichtung der ersten durchgehenden Bahn (504) definiert sind; und Ablegen und Verkleben einer zweiten durchgehenden Bahn (503) auf bzw. an der ersten durchgehenden Bahn (504), um so die flüssigkeitsabsorbierenden Kerne (505) abzudecken.

6. Prozess nach Anspruch 5, wobei die erste durchge-

hende Bahn (504) aus flüssigkeitsundurchlässigem Material hergestellt ist und die zweite durchgehende Bahn (503) aus flüssigkeitsdurchlässigem Material hergestellt ist.

Revendications

1. Article absorbant jetable destiné à être porté (1) ayant une direction longitudinale, une direction transversale orthogonale à ladite direction longitudinale, une région de taille avant (8), une région de taille arrière (9) et une région d'entrejambes (10) entre lesdites régions de taille avant et arrière (8, 9) et comprenant une structure absorbante (1A) comprenant une feuille supérieure imperméable au liquide (3), et une feuille inférieure imperméable au liquide (4), une partie centrale absorbant le liquide (5) disposée entre elles, une paire de rabats latéraux (6) s'étendant vers l'extérieur à partir des bords latéraux transversalement opposés de ladite partie centrale (95) et, une pluralité d'éléments élastiques (12) associés à chaque passage de jambe, lesdits éléments élastiques (12) étant placés sur des découpes formées dans lesdits rabats latéraux (6) pour entourer les cuisses d'un utilisateur,
ledit article (1) étant **caractérisé en ce que :**

lesdits éléments élastiques (12) associés à chaque passage de jambe convergent sensiblement en un seul paquet respectif le long d'une première zone élastique (S) s'étendant sur une zone centrale de ladite région d'entrejambes (10) et divergent progressivement de ladite première zone élastique (S) vers lesdites deuxième et troisième zones élastiques (F, B) s'étendant de ladite première zone élastique (S) jusqu'aux bords latéraux desdites régions de taille avant et arrière (8, 9) ; et
lesdits éléments élastiques (12) ont une contrainte de traction dans ladite première zone élastique (S) qui n'est pas supérieure à celle dans lesdites deuxième et troisième zones élastiques (F, B).

2. Article selon la revendication 1, dans lequel lesdits éléments élastiques (12) sont respectivement espacés dans lesdites premières zones élastiques (S) par rapport auxdits bords latéraux de ladite partie centrale (5) d'au moins 10 mm.

3. Procédé pour placer des éléments élastiques associés à des passages de jambe sur un article absorbant jetable destiné à être porté (1), comprenant les étapes consistant à :

(a) alimenter une première bande continue (504) sous la forme d'un composant dudit article (1) dans sa direction longitudinale à une vitesse donnée et en recouvrant en même temps de manière continue ladite première bande continue (504) le long de ses bords latéraux transversalement opposés dans sa direction longitudinale avec une colle en fusion pour former des première et deuxième zones adhésives (71A, 71 B) ;
(b) alimenter les premier et second éléments élastiques continus (512A, 512B) associés aux passages de jambe dudit article (1), chacun comprenant une pluralité d'éléments élastiques continus espacés les uns des autres et sous tension, sur lesdites première et seconde zones adhésives (71A, 71 B), respectivement ; et
(c) couper ladite première bande continue (504) le long des lignes s'étendant dans sa direction transversale sur les zones (77A, 77B) respectives desdits premier et second éléments élastiques continus (512A, 512B) conjointement auxdits premier et second éléments élastiques continus (512A, 512B) de sorte qu'après cela, lesdites zones (77A, 77B) se contractent ;

caractérisé en ce que, à l'étape (b), lesdits premier et second éléments élastiques continus (512A, 512B) sont alimentés de sorte que lesdits premier et second éléments élastiques continus (512A, 512B) s'étendent sur lesdites première et seconde zones adhésives (71A, 71 B) de ladite première bande continue (504) au-delà des bords latéraux interne et externe (72A, 72B ; 73A, 73B) respectifs desdites première et seconde zones adhésives (71A, 71 B) et décrivent respectivement des courbes sensiblement sinusoïdales autour desdites zones adhésives (71A, 71 B) respectives, les premières autres zones (74A, 74B) respectives desdits premier et second éléments élastiques continus (512A, 512B) se trouvant sur lesdites première et seconde zones adhésives (71A, 71 B) qui sont fixées sur lesdites première et seconde zones adhésives (71A, 71 B) respectivement, et les secondes autres zones (76A, 76B) respectives desdits premier et second éléments élastiques continus s'étendant au-delà desdits bords latéraux internes (72A, 72B) desdites première et seconde zones adhésives (71A, 71B) qui sont décalées de manière contractile sur lesdites première et seconde zones adhésives (71A, 71 B) afin d'être fixées sur lesdites première et seconde zones adhésives (71A, 71 B) respectivement, et de sorte que lesdits premier et second éléments élastiques continus (512A, 512B) convergent respectivement sensiblement en un seul paquet dans lesdites secondes zones (76A, 76B) respectives alors que lesdits premier et second éléments élastiques continus (512A, 512B) divergent progressivement desdites secondes zones (76A, 76B) respectives vers lesdites premières zones (74A, 74B) respectives ; et de sorte

qu'une contrainte de traction desdites secondes zones (76A, 76B) respectives n'est pas plus importante que celle desdites premières zones (74A, 74B) respectives.

4. Procédé selon la revendication 3, dans lequel lesdites première et seconde zones adhésives (71A, 71B) sont formées en recouvrant de manière continue lesdits bords latéraux transversalement opposés de ladite première bande continue (504) avec de la colle en fusion afin de décrire une pluralité de spirales s'étendant dans la direction longitudinale de ladite première bande continue (504).

5. Procédé selon la revendication 3 ou 4, comprenant en outre les étapes consistant à placer des parties centrales absorbant le liquide (505) sur des zones données de ladite première bande continue (504) définies entre lesdites première et seconde zones adhésives (71A, 71 B) à des intervalles donnés dans la direction longitudinale de ladite première bande continue (504) ; et placer et coller une seconde bande continue (503) sur celle-ci et sur ladite première bande continue (504) afin de recouvrir lesdites parties centrales absorbant le liquide (505).

6. Procédé selon la revendication (5), dans lequel ladite première bande continue (504) est réalisée avec un matériau imperméable au liquide et ladite seconde bande continue (503) est réalisée avec un matériau perméable au liquide.

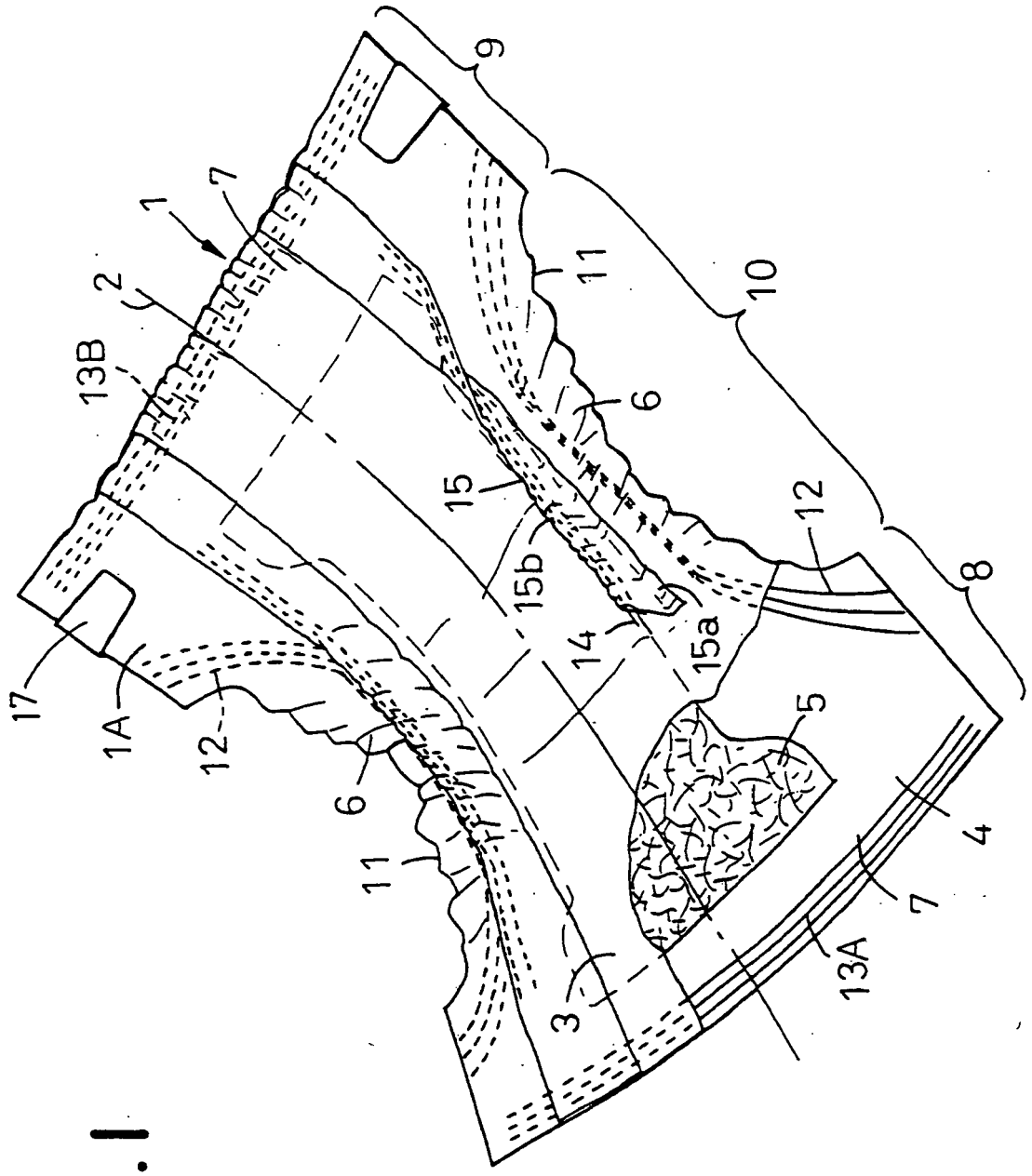
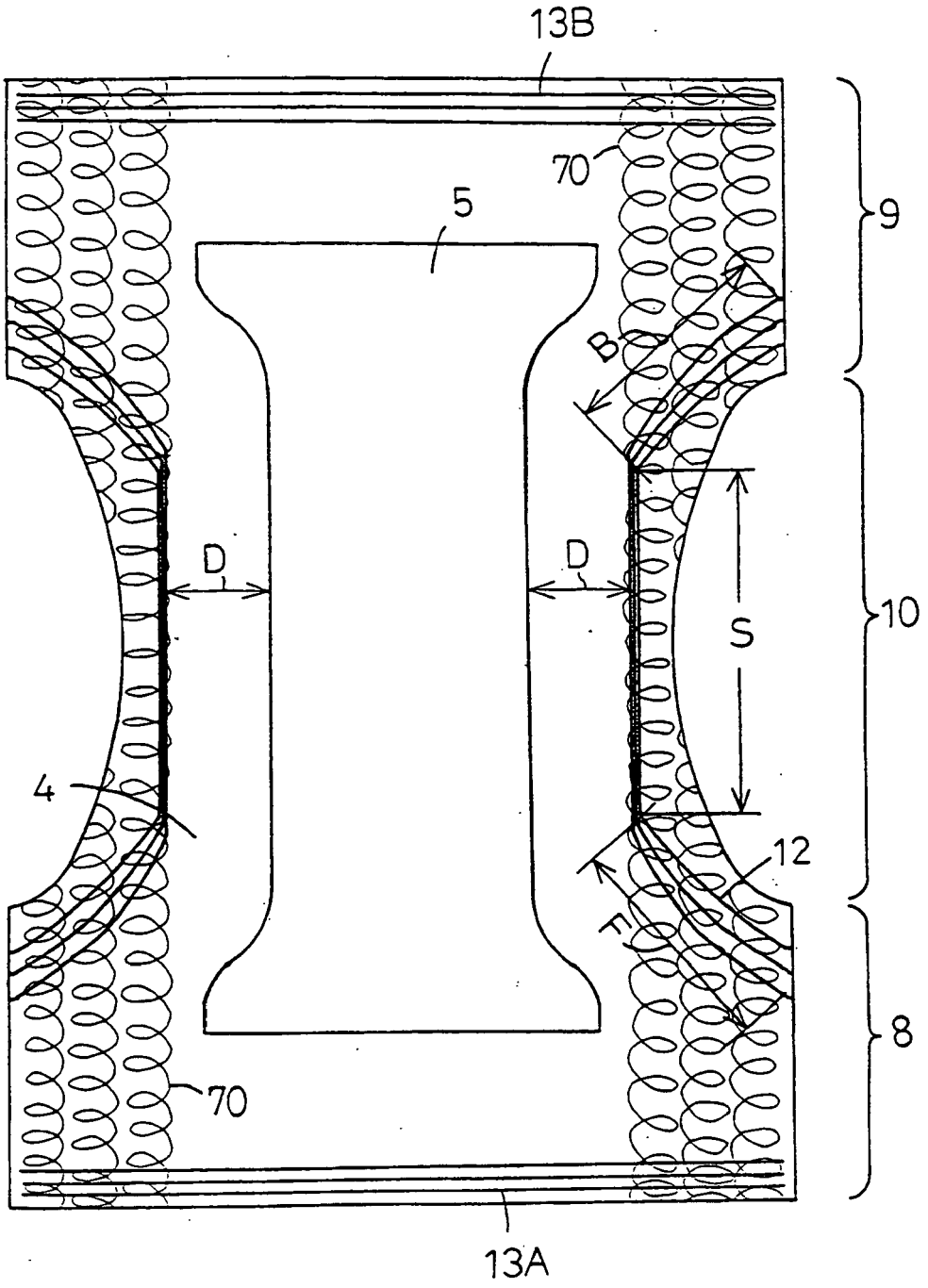


FIG. I

FIG.2



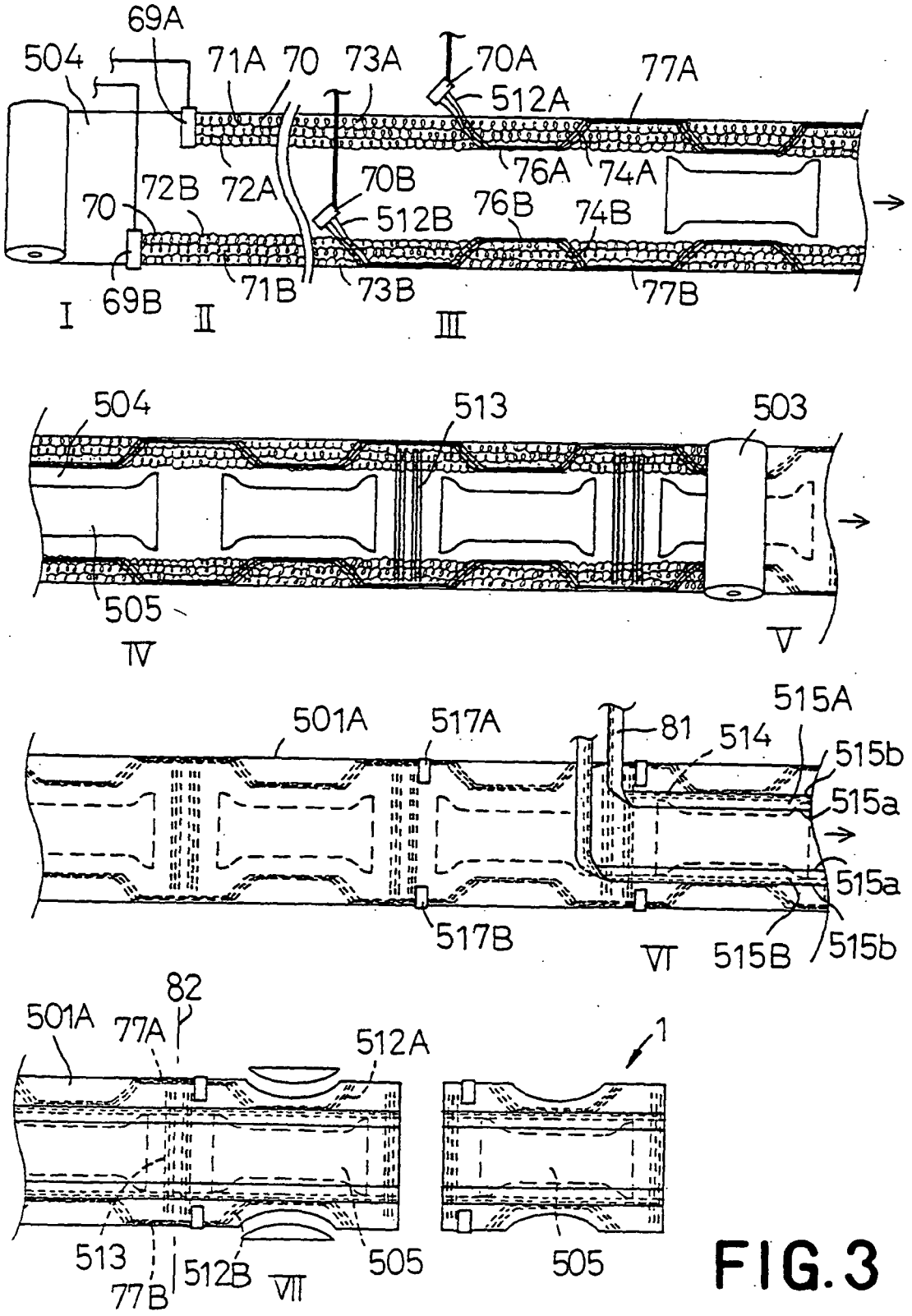
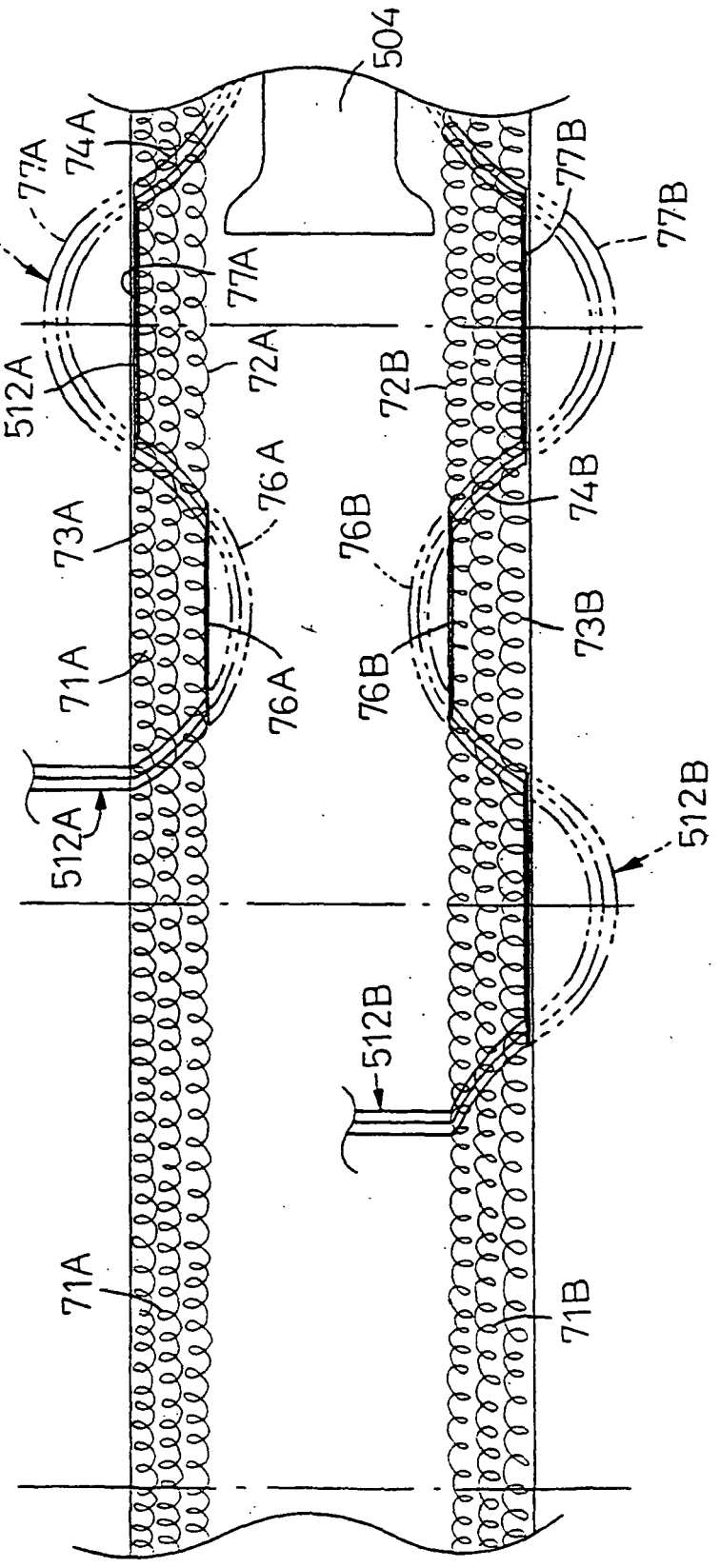

69A
504
71A
70
73A
70A
512A
77A
76A
74A
72B
72A
70B
70
512B
76B
74B
71B
73B
77B
69B
I
II
III
504
513
503
505
IV
V
501A
517A
81
514
515A
515b
515a
517B
VI
515B
515b
82
501A
77A
512A
1
513
77B
512B
VII
505
505

FIG.3

FIG.4


504
512A
77A
74A
77B
77B
77A
512A
72A
72B
76A
73A
76B
74B
71A
76A
76B
73B
512A
512B
512B
71A
71B

REFERENCES CITED IN THE DESCRIPTION

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