

(19)



(11)

EP 3 067 456 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
29.11.2017 Bulletin 2017/48

(51) Int Cl.:
D05B 35/06 (2006.01) D05B 93/00 (2006.01)

(21) Application number: **16000544.3**

(22) Date of filing: **07.03.2016**

(54) SEWN PRODUCT AND SEWING METHOD OF MATERIAL

GENÄHTES PRODUKT UND NÄHVERFAHREN FÜR MATERIAL

PRODUIT COUSU ET PROCÉDÉ DE COUTURE DE MATÉRIAU

(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**

(30) Priority: **12.03.2015 JP 2015049879**

(43) Date of publication of application:
14.09.2016 Bulletin 2016/37

(73) Proprietors:
• **YKK Corporation**
Chiyoda-ku, Tokyo 101-8642 (JP)
• **Gotalio Co., Ltd.**
Kanagawa 227-0043 (JP)

(72) Inventors:
• **Furukawa, Kazuhide**
Osaka-shi, Osaka, 537-0024 (JP)
• **Higuchi, Hiromi**
Osaka-shi, Osaka, 537-0024 (JP)
• **Matsushima, Haruo**
Kurobe-shi, Toyama, 938-8601 (JP)

(74) Representative: **Leinweber & Zimmermann**
Rosental 7, II. Aufgang
80331 München (DE)

(56) References cited:
EP-A1- 2 682 015 GB-A- 2 192 201
JP-A- H10 295 967 JP-Y1- S4 619 610
JP-Y1- S5 022 145 US-A1- 2014 182 498

EP 3 067 456 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a sewn product and a sewing method of material, and particularly relates to a sewn product in which material edges having different thickness, for example, an edge of a fastener tape and an edge of a main material are stitched together and a sewing method for producing the same.

Related Art

[0002] For stitching a fastener tape for a slide fastener and a main material, in order to ensure the strength of a stitched portion, the main material is overlapped on one surface of the fastener tape at an edge-side of the tape in the width direction, and then the fastener tape and the main material are stitched in plain seam. Subsequently, the main material is folded back, and then, the fastener tape and the main material are further stitched together. Generally, the main material is also overlapped on the other surface of the fastener tape and then stitched with the tape in plain seam. After that, the main material is folded back, and then the fastener tape and the main material are further stitched together. Thus, the stitched portions are thick and hard. In addition, since the main material and the fastener tape are partially overlapped and then further folded back, both of the fastener tape and the main material are necessary to have larger sizes for that. For example, the width of the fastener tape is required to have five to six times of the width that is occupied by its elements. Accordingly, both material costs for the fastener tape and the main material are high.

[0003] There is known a sewing method of material in which material edges are stitched together without being superimposed, using a flat seamer sewing machine having four or five needles and using six threads (e.g. refer to Patent document 1). According to the sewing method using the flat seamer sewing machine, since the material edges are stitched together in an abutted state, the unevenness in a stitched portion can be reduced. In addition, since the material edges are stitched together with six threads, the strength of the stitched portion can be ensured. However, in the sewing method of material using the flat seamer sewing machine, the material edges are stitched together with six threads, so that the thickness of the stitched portion is increased by thicknesses of the threads, and the stitched portion is conspicuous due to its long width. Thus, in a case where the edge of the fastener tape and the edge of the main material are stitched together in an abutted state by using the flat seamer sewing machine, the sewn width of the stitched portion is raised widely so as to cause a bumpy texture, and the sewing holes appear complicated, which may be a damage for the design. Also, when actually sewing them by using the flat seamer sewing machine, stopping force against a lateral load is so weak that a gap is generated between the materials, and thus, superimposed seam is mainly adopted for such stitching and materials-abutted seam is rarely used.

[0004] Further, Japanese Patent No. 5,341,961 (Patent document 2) discloses a technique for solving the above-mentioned problems in the sewing method using the flat seamer sewing machine. However, the Patent document 2 fails to disclose solving a specific technical problem which is caused when sewing the materials with different thicknesses in materials-abutted seam. The inventors of the present invention have found a problem that, in a case where an edge of a fastener tape and an edge of a main material are stitched together in an abutted state by using this technique, the fastener tape is finished waving in its longitudinal direction. Moreover, it has been a conventional common knowledge that a fastener is sewn in the superimposed (overlapped) seam as described above, and sewing in another method is not suggested by the Patent document 2, nor such an idea is disclosed in any prior art.

[0005]

[Patent document 1] JP 2000-197783 A

[Patent document 2] Japanese Patent No. 5,341,961

SUMMARY OF THE INVENTION

[0006] Accordingly, the present invention has been made in view of the above problems, and an object of the present invention is to provide a sewn product in which material edges are stitched together and a sewing method for producing the same, in which a thickness, a bumpy texture, hardness of a stitched portion of two materials with different thicknesses, such as a fastener tape and a main material, would be reduced; the stitched portion would be less noticeable and finished to be simpler; and the strength of the stitched portion may be ensured.

[0007] Another object of the present invention is to provide a sewn product and a sewing method of material, which would save material costs and simplify sewing processes.

[0008] Still another object of the present invention is to provide a sewing method of material, which may reduce or prevent waving of a fastener tape.

[0009] In order to solve the above-described objects, according to one aspect of the present invention, there is provided

a sewn product in which an edge of a first material and an edge of a second material that is thicker than the first material are stitched together in an abutted state, wherein the edge of the first material and the edge of the second material are stitched together with one bobbin thread and a plurality of needle threads, the plurality of needle threads being interlocked with the one bobbin thread to form a plurality of rows of zigzag stitched seams.

[0010] In the sewn product, two rows of zigzag stitched seams may be formed by two needle threads, and wherein the edge of the first material may be overedge-stitched by one of the two needle threads and the bobbin thread, and the edge of the second material may be overedge-stitched by the other of the two needle threads and the bobbin thread.

[0011] In the sewn product, three rows of zigzag stitched seams may be formed by three needle threads. One of the three needle threads may be stitched alternately to the edge of the first material and the edge of the second material. The other two of the three needle threads may be stitched to the edge of the first material or the edge of the second material at both sides of the one needle thread.

[0012] In the sewn product, the first material may be a fastener tape to which elements are attached.

[0013] In the sewn product, a length of the fastener tape in a width direction (see "T" in FIG. 9) may be twice to four times of a length of the elements in the width direction (see "E" in FIG. 9). In conventional stitching of a fastener tape and a main material, since they are necessary to be partially superimposed or overlapped, a length of the fastener tape in its width direction is required to be larger for that accordingly. Thus, the length of the fastener tape in the width direction is required to be five to six times of the width of the elements.

[0014] In addition, according to another aspect of the present invention, there is provided a sewing method of material in which an edge of a first material and an edge of a second material that is thicker than the first material are stitched together in an abutted state, wherein the edge of the first material and the edge of the second material are stitched together with one bobbin thread and a plurality of needle threads, the plurality of the needle threads being interlocked with the one bobbin thread to form a plurality of rows of zigzag stitched seams.

[0015] In the sewing method of material, the edge of the first material and the edge of the second material may be stitched together with using a sewing machine which includes a vertical full rotation shuttle and a plurality of sewing needles, wherein the plurality of sewing needles are arranged in a direction perpendicular to a feed direction of the first and second materials and sway in the direction perpendicular to the feed direction.

[0016] In the sewing method of material, the first material and the second material may be respectively fed with feed dogs that are set at different feed rates, while the first and second materials are pressed at an equal pressure.

[0017] In the sewing method of material, the feed rate of the feed dog for feeding the second material may be set to be higher than the feed rate of the feed dog for feeding the first material.

[0018] In the sewing method of material, the first material may be a fastener tape to which elements are attached.

[0019] In the sewing method of material, a length of the fastener tape in a width direction may be twice to four times of a length of the elements in the width direction.

[0020] The present invention provides a sewn product in which material edges are stitched together and a sewing method for producing the same, wherein a thickness, a bumpy texture, hardness of a stitched portion of two materials with different thicknesses, such as a fastener tape and a main material, would be reduced; the stitched portion would be less noticeable and finished to be simpler; and the strength of the stitched portion may be ensured. Further, the present invention provides a sewn product and a sewing method of material, which would save material costs and simplify sewing processes. Moreover, the present invention provides a sewing method of material, which may reduce or prevent waving of a fastener tape.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021]

FIG. 1 is a top plan view showing one surface of a sewn product according to one embodiment;

FIG. 2 is a top plan view showing the other surface of the sewn product;

FIG. 3 is a three-dimensional view showing a sewing pattern at a stitched portion;

FIG. 4 is a cross-sectional view taken along line 4-4 of FIG. 1;

FIG. 5 is an elevation view showing one embodiment of a material sewing method;

FIG. 6 is a perspective view showing one embodiment of the material sewing method;

FIG. 7 is a front view that illustrates a state where a fastener tape and a main material are fed with feed dogs while they are pressed by a material presser of a sewing machine, in which the fastener tape and the main material are shown in cross-sections;

FIG. 8 is a perspective view that illustrates the feed dogs exposed above a throat plate;

FIG. 9 is a cross-sectional view of a pair of left and right fastener tapes that are stitched with a main material;

FIG. 10 is a top plan view showing one surface of a sewn product according to another embodiment;

FIG. 11 is a top plan view showing the other surface of the sewn product;

FIG. 12 is a three-dimensional view showing a sewing pattern of a stitched portion; and
FIG. 13 is a cross-sectional view taken along line 11-11 of FIG. 10.

DETAILED DESCRIPTION OF THE INVENTION

[0022] Hereinafter, one embodiment of the present invention will be described with reference to the accompanying drawings. FIG. 1 is a top plan view showing one surface of a sewn product 10 according to one embodiment, and FIG. 2 is a top plan view showing the other surface of the sewn product 10. As shown in the Figures, the sewn product 10 is produced by stitching an edge (hereinafter, also called as a "tape edge") 12A of a fastener tape 12 as an example of a first material and an edge (hereinafter, also called as a "material edge") 14A of a main material 14 as a second material that is thicker than the fastener tape 12 in an abutted state without overlapping them. The fastener tape 12 is a fabric or a knitted fabric. The main material 14 is a material for producing clothes, a bag or the like, and examples thereof include felted fabric, knitted fabric, compressed wool knit, jersey and the like, but the main material 14 is not limited to them. The sewn product 10 is clothes, a bag or the like which uses a slide fastener (not illustrated).

[0023] In the present embodiment, the fastener tape 12 is thinner than the main material 14 (see FIG. 4, etc.), but the present invention is not limited to this embodiment, and the main material 14 may be thinner than the fastener tape 12.

[0024] Two needle threads 16 and 18 and one bobbin thread 20 are used for stitching the tape edge 12A and the material edge 14A. In the following description, the surface of the sewn product 10, on which the needle threads 16 and 18 are exposed as stitched seams is referred to as front, and the surface of the sewn product 10, on which the bobbin thread 20 is exposed as stitched seams is referred to as rear. To the front surface of the fastener tape 12, elements 15 (see FIG. 7, etc.) is attached.

[0025] The two needle threads 16 and 18 are arranged in parallel while positioning between them a boundary line L where the tape edge 12A and the material edge 14A are abutted to each other without being overlapped. The needle thread 16 forms zigzag stitched seams on the front surface of the tape edge 12A, and the needle thread 18 forms zigzag stitched seams on the front surface of the material edge 14A. The needle threads 16 and 18 are interlocked with the bobbin thread 20 at turning points 16A, 16B, 18A and 18B, thereby forming knots.

[0026] All of the turning points 16A of the needle threads 16 at the boundary line L-side and the turning points 18A of the needle thread 18 at the boundary line L-side are positioned on the boundary line L. The turning points 16A and 18B are arranged in a direction perpendicular to the boundary line L (in X direction in the Figures). The turning points 16B and 18A are also arranged in the X direction. The intervals L1 between the turning points 16A and 18B in the X direction and between the turning points 16B and 18A in the X direction are set to a predetermined value (e.g. 2.00 mm). The interval L2 between the turning points 16A and 16B in the X direction and the interval L3 between the turning points 18A and 18B in the X direction are set to a predetermined value (e.g. 2.00 mm). Accordingly, the width L4 of the stitched seams formed by the needle threads 16 and 18 becomes a predetermined value (e.g. 4.00 mm).

[0027] As shown in FIG. 2, the bobbin thread 20 extends in the direction along the boundary line L (Y direction in the Figures) while passing via the turning points 16A, 16B, 18A and 18B on the rear surfaces of the tape edge 12A and the material edge 14A. Here, following the bobbin thread 20 in the Y direction, the bobbin thread 20 passes via the individual turning points in the sequence of 18B → 18A → 16B → 16A → 18B → 18A → 16B (to be repeated).

[0028] FIG. 3 is a three-dimensional view showing a sewing pattern of a stitched portion of the tape edge 12A and the material edge 14A. As shown in this Figure, following the pattern of the bobbin thread 20 in the Y direction, the bobbin thread 20 forms a knot together with the needle thread 18 at the turning point 18B and then forms a knot together with the needle thread 16 at the next turning point 16A. Then, the bobbin thread 20 passes via the same turning point 18B, forms a knot together with the needle thread 18 at the turning point 18A and then forms a knot at the next turning point 16B. Afterwards, the bobbin thread 20 passes via the same turning point 18A, forms a knot together with the needle thread 18 at the turning point 18B and then forms a knot at the next turning point 16A. This pattern is repeated.

[0029] FIG. 4 is a cross-sectional view taken along line 4-4 of FIG. 1. As shown in this Figure, the tape edge 12A is overedge-stitched by the needle thread 16 and the bobbin thread 20 between the turning points 16B-16A and the material edge 14A is overedge-stitched by the needle thread 18 and the bobbin thread 20 between the turning points 18B-18A.

[0030] Here, since the tension of the needle thread 16 and the bobbin thread 20 that are interlocked together to surround the tape edge 12A acts so as to compress the tape edge 12A, the density of the tape edge 12A is increased. In addition, since the tension of the needle thread 18 and the bobbin thread 20 that are interlocked together to surround the material edge 14A acts so as to compress the material edge 14A, the density of the material edge 14A is increased.

[0031] FIG. 5 is an elevation view showing one embodiment of a material sewing method, and FIG. 6 is a perspective view showing the material sewing method according to this embodiment. As shown in FIG. 5, a sewing machine to be used in stitching the tape edge 12A and the material edge 14A together includes two sewing needles 1 and 2, a vertical full rotation shuttle 4, and a throat plate 3, which is disposed between the sewing needles 1 and 2 and the vertical full rotation shuttle 4. The two sewing needles 1 and 2 are arranged parallel in the direction (the right and left direction in the Figure) that is perpendicular to the material feed direction (from the front side to the back side of the Figure). The

sewing needles 1 and 2 are configured to be moved upward and downward and to be swayed in the right and left direction of the Figure by a swaying mechanism, which is not shown. The needle thread 16 is passed through a thread hole of the sewing needle 1, and the needle thread 18 is passed through a thread hole of the sewing needle 2.

[0032] The vertical full rotation shuttle 4 is a shuttle which rotates counterclockwise in the Figure about a rotary shaft that is parallel to the material feed direction. The shuttle 4 includes a bobbin (not shown) around which the bobbin thread 20 is wound, and a sword tip (not shown) which widens loops of the needle threads 16 and 18, or the like. The throat plate 3 is formed with holes through which the sewing needles 1 and 2 pass.

[0033] The sewing machine used for stitching the tape edge 12A and the material edge 14A comprises: a material presser 30 (see FIG. 7) for pressing the fastener tape 12 and the main material 14 that is thicker than the fastener tape 12 against the throat plate 3 at an equal pressure; and a material feeding mechanism which includes feed dogs 40a, 41a, 40b and 41b (see FIG. 8, etc.) for feeding the fastener tape 12 and the main material 14 at different feed rates (or feed speeds). Processes for stitching the tape edge 12A and the material edge 14A by using the sewing machine which has the above-described structure will be explained as follows, but the material presser 30 and the material feeding mechanism which includes the feed dogs 40a, 41a, 40b and 41b will be described later. As shown in FIG. 6, the sewing needles 1 and 2 with the needle threads 16 and 18 having passed through the thread holes thereof are caused to penetrate through the turning points 16B and 18A, respectively, and the vertical full rotation shuttle 4 is rotated while the sewing needles 1 and 2 are being pulled upward. Here, the loops of the needle threads 16 and 18 are widened by the sword tip of the vertical full rotation shuttle 4, the bobbin thread 20 is caused to pass through the loops. In that state, the needle threads 16 and 18 are pulled upward. This causes the needle thread 16 and the bobbin thread 20 to form a knot at the turning point 16B and the needle thread 18 and the bobbin thread 20 to form a knot at the turning point 18A.

[0034] Afterwards, the fastener tape 12 and the main material 14 are fed in the Y direction, and the sewing needles 1 and 2 are swayed rightward in the Figure so as to penetrate through the turning points 16A and 18B, respectively. Then, the vertical full rotation shuttle 4 is rotated while the sewing needles 1 and 2 are being pulled upward. This causes the needle thread 16 and the bobbin thread 20 to form a knot at the turning point 16A and the needle thread 18 and the bobbin thread 20 to form a knot at the turning point 18B.

[0035] In subsequence, the fastener tape 12 and the main material 14 are fed in the Y direction, and the sewing needles 1 and 2 are swayed leftward in the Figure so as to penetrate through the turning points 16B and 18A, respectively. The vertical full rotation shuttle 4 is rotated while the sewing needles 1 and 2 are being pulled upward. This causes the needle thread 16 and the bobbin thread 20 to form a knot at the turning point 16B and the needle thread 18 and the bobbin thread 20 to form a knot at the turning point 18A. The above-described sequences are repeated, and thus the tape edge 12A and the material edge 14A are sewn in a manner of two-row zigzag stitching while being overedge-stitched by the needle threads 16 and 18 and the bobbin thread 20.

[0036] As described above, the stitched portion of the sewn product 10 produced by sewing the tape edge 12A and the material edge 14A together via two-row zigzag stitching with two needle threads 16 and 18 and one bobbin thread 20 has a sufficient amount of tensile strength since the density of the tape edge 12A and the material edge 14A is increased by the tension of two needle threads 16 and 18 and one bobbin thread 20.

[0037] Since the tape edge 12A and the material edge 14A are sewn with a small number of threads, i.e. three threads, it is possible to reduce the thickness of the stitched portion compared to that of the stitched portion with six threads using a flat seamer sewing machine. This can reduce the unevenness of the stitched portion and a bumpy texture or make the stitched portion less noticeable. In addition, since the width of the stitched portion can be reduced compared to that of a stitched portion with six threads using a flat seamer sewing machine, the former stitched portion can be made much less noticeable. Here, when the sewn product 10 is a garment such as an outerwear in which the stitched seams are exposed to the outside, it is possible to improve the quality of design by making the stitched portions less noticeable.

[0038] In addition, in the sewn product 10 according to this embodiment, since the tape edge 12A is overedge-stitched with the needle thread 16 and the bobbin thread 20 and the material edge 14A is overedge-stitched with the needle thread 18 and the bobbin thread 20, the tape edge 12A and the material edge 14A can be prevented from being untied.

[0039] While stitching the tape edge 12A and the material edge 14A as described above, the fastener tape 12 and the main material 14 are pressed onto the throat plate 3 at an equal pressure by the material presser 30 (see FIG. 7). In addition, the feeding of the fastener tape 12 and the main material 14 in the Y direction is set such that the feed rate of the main material 14 which is placed in the right side will be slightly higher than the feed rate of the fastener tape 12 which is placed in the left side, by the left-hand feed dogs 40a and 41a and right-hand feed dogs 40b and 41b (see FIGs. 7 and 8) of the material feeding mechanism. The reason for such control is as follows. Since the main material 14 is thicker than the fastener tape 12, if they are sewn by using a usual sewing machine foot, the thinner fastener tape 12 could not be pressed firmly by the sewing machine foot. If they are actually sewn in such a state, since the sewing machine feeds the fastener tape 12 intermittently, the pressure to press the material and tape would be changed, resulting in uneven feeding or pitch failure. In order to prevent them, for applying an equal pressure to the fastener tape 12 and the main material 14 respectively even if they have different thicknesses, the sewing machine foot that has a seesaw function as the material presser 30 is used to press the material and tape. However, the inventors of the present invention

have found that, when the fastener tape 12 and the main material 14 are sewn while they are pressed at the same pressure, there are generated in the fastener tape 12 wrinkles that wave in the longitudinal direction. Further, the inventors have found a cause that, when the fastener tape 12 and the main material 14 are withdrawn underneath the material-press parts that apply the equal pressure to them respectively, the main material 14 that is thicker than the fastener tape 12 is stitched in a state of being slightly stretched in the feed direction, and the stretched main material 14 is shrunk after being stitched, thereby causing such wrinkles. In order to prevent this, the feed rate of the thicker main material 14 under the equal press is set to be slightly higher than the feed rate of the fastener tape 12.

[0040] FIG. 7 is a front explanatory view that illustrates a state where the fastener tape 12 and the main material 14 are pressed against the throat plate 3 at an equal pressure by the material presser 30 of the sewing machine. In this Figure, the reference numerals 40a and 41a denote left feed dogs for feeding the fastener tape 12 in the feed direction (the direction from front to rear of FIG. 7), and the reference numerals 40b and 41b denote right feed dogs for feeding the main material 14. The fastener tape 12 has elements 15 on its edge which is opposite, in the width direction, to the edge that is to be stitched with the main material 14. The material presser 30 comprises: a main body 31; and a pair of left and right material-press parts 32a and 32b that are extended downward and frontward (toward the front of FIG. 7) from the main body 31. In this embodiment, the left material press part 32a presses the fastener tape 12, and the right material press part 32b presses the main material 14. The main body 31 incorporates an interlocking mechanism (a seesaw mechanism), which can equalize both pressures of the material-press parts 32a and 32b for pressing materials with different thicknesses, by accordingly lowering one of the material-press parts 32a and 32b when the other is raised.

[0041] Such an interlocking mechanism is disclosed in, for example, JP S56-17112 B. With such an interlocking mechanism, the fastener tape 12 and the main material 14 are pressed onto the throat plate 3 at an equal pressure by the material press parts 32a and 32b, respectively.

[0042] FIG. 8 illustrates the left feed dogs 40a and 41a and the right feed dogs 40b and 41b that are exposed upward from openings of the throat plate 3 that is incorporated in a table (not illustrated) of the sewing machine. These feed dogs 40a, 41a, 40b and 41b are shown also in FIG. 7. The feed dogs 41a and 41b are divided into forth and back portions in the feed direction with a needle hole between the forth and back portions. In the present embodiment, the left feed dogs 40a and 41a are for feeding the fastener tape 12, and the right feed dogs 40b and 41b are for feeding the main material 14. Further, a feed rate of the right dogs 40b and 41b is set to be slightly higher than that of the left feed dogs 40a and 41a. Such a technique that can set each feed rate of the left and right feed dogs separately and independently is disclosed in JP H3-191984 A, for example.

[0043] As described above, by setting the feed rate of the thicker main material 14 to be higher than that of the fastener tape 12 while pressing the fastener tape 12 and the main material 14 at an equal pressure, the tape edge 12A and the material edge 14A are stitched together without overstretching or overshrinking one of the fastener tape 12 and the main material 14 compared to the other. Thereby, waving of the fastener tape 12 in the longitudinal direction can be prevented. In addition, it is not necessary to fold back the main material 14 at the time of stitching, and a facing is also unnecessary, whereby material costs for the fastener tape 12 and the main material 14 may be saved, and the sewing processes may be simplified.

[0044] FIG. 9 is a partial cross-sectional explanatory view that illustrates a pair of the left and right fastener tapes 12 that are stitched with the main material 14. In the present invention, the tape edge 12A and the material edge 14A are stitched together in an abutted state without being overlapped. Thus, it is possible to shorten the length of each of the fastener tapes 12 in the width direction compared to that of a conventional fastener tape, and material costs may be saved for that. More in detail, it has conventionally been necessary to set a total length (T) of the left and right fastener tapes 12 in the width direction to be five to six times of a length (E), in the width direction, occupied by the left and right elements 15 that are engaged with each other, in consideration of margins to be overlapped with the main material 14. Whereas, in the present invention, it is possible to curtail the length (T) of the left and right fastener tapes 12 in the element-closed state as small as twice to four times of the length (E) of the left and right elements 15 in the width direction. Usually, in a case of sewing fastener tapes in a state of overlapping with a main material, when the length (E) of elements in the width direction ranges between 5 mm to 6 mm, the fastener tapes are mostly sewed while being pressed by a sewing machine foot with a width of 4 mm. In this case, the length (T), in the width direction, of the fastener tapes that are exposed after being sewn ranges from 13 mm to 14 mm, namely, 5 mm to 6 mm + 4 mm + 4 mm. This is one of the standard products that are familiar to current consumers, and is a good-looking product that is demanded by consumers. From this point of view for providing such a sewing product which is matched with the consumers' needs, also in the present invention, the most preferable range of the length (T), in the width direction, of the left and right fastener tapes 12 in the element-closed state is 2.33 to 2.60 times (14/6 to 13/5) of the length (E) of the left and right elements 15 in the width direction. In a practical sense, however, the preferable range is twice to three times, if considering error spans of the processing of the sewn products and their visual impressions. On the other hand, however, for mass-producing such fasteners by existing automatic manufacturing equipment, the fastener tapes are required to be held by being pinched by grippers of the automatic manufacturing equipment for being conveyed between their respective production processes. Accordingly, such fastener tapes are necessary to have a width which is enough to be held by the grippers,

whereby, from this technical limitation, it has found that the length (T) of the left and right fastener tapes 12 in the element-closed state in the width direction is required to be at least four times of the length (E) of the left and right elements 15 in the width direction. Therefore, in the case of mass-producing the fasteners by the existing automatic manufacturing equipment while minimizing the exposed width of the fasteners, four times is an upper limit.

[0045] FIG. 10 is a top plan view showing one surface of a sewn product 100 according to another embodiment, and FIG. 11 is a top plan view showing the other surface of the sewn product 100. As shown in these Figures, three needle threads 16, 18 and 22 and one bobbin threads 20 are used for stitching the tape edge 12A and the material edge 14A. Also in this embodiment, the above-mentioned equal press of the fastener tape 12 and the main material 14 and an increase in the feed rate of the main material 14 are adopted.

[0046] The two needle threads 16 and 18 are arranged in parallel while positioning between them the boundary line L at which the tape edge 12A and the material edge 14A are abutted to each other. The needle thread 16 forms zigzag stitched seams on the front surface of the tape edge 12A, and the needle thread 18 forms zigzag stitched seams on the front surface of the material edge 14A. In addition, the needle thread 22 forms zigzag stitched seams on the front surfaces of the tape edge 12A and of the material edge 14A while bridging over the boundary line L. The needle threads 16, 18 and 22 are respectively interlocked with the bobbin thread 20 at the turning points 16A, 16B, 18A, 18B, 22A and 22B, thereby forming knots.

[0047] The turning points 22A and 22B of the needle threads 22 are positioned on the tape edge 12A and the material edge 14A, respectively. The turning points 16A, 22B and 18B are arranged in the direction perpendicular to the boundary line (X direction in the Figure), and the turning points 16B, 22A and 18A are arranged in the X direction.

[0048] As shown in FIG. 11, the bobbin thread 20 extends in the direction along the boundary line L (Y direction in the Figure) on the rear surfaces of the tape edge 12A and the material edge 14A while passing via the turning points 16A, 16B, 18A, 18B, 22A and 22B. Following the bobbin thread 20 in the Y direction, the bobbin thread 20 passes via the individual turning points in the sequence of 18B → 18A → 22B → 16B → 22B → 18A → 18B → 22A → 16A → 22A → 18B (to be repeated).

[0049] FIG. 12 is a three-dimensional view showing a sewing pattern of a stitched portion of the tape edge 12A and the material edge 14A. As shown in this Figure, following the pattern of the bobbin thread 20 in the Y direction, the bobbin thread 20 forms a knot together with the needle thread 18 at the turning point 18B, and forms a knot together with the needle thread 22 at the next turning point 22B. The bobbin thread 20 forms a knot together with the needle thread 16 at the turning point 16A, passes via the turning points 22B and 18B, and forms a knot together with the needle thread 18 at the turning point 18A. The bobbin thread 20 forms a knot together with the needle thread 22 at the turning point 22A, and forms a knot together with the needle thread 16 at the turning point 16B. The bobbin thread 20 passes via the turning points 22A and 18A and then forms a knot together with the needle thread 18 at the turning point 18B. This pattern is repeated.

[0050] FIG. 13 is a cross-sectional view taken along line 11-11 of bobbin thread 20 which are interlocked together surround the tape edge 12A and the material edge 14A while bridging over the boundary line L. At one side of the boundary line, the needle thread 16 and the bobbin thread 20 which are interlocked together surround the tape edge 12A. At the other side of the boundary line, the needle thread 18 and the bobbin thread 20 which are interlocked together surround the material edge 14A.

[0051] Here, the tension of the needle thread 22 and the bobbin thread 20 acts so as to compress the portions of the tape edge 12A and the material edge 14A that are surrounded by the needle thread 22 and the bobbin thread 20. This consequently increases the density of the surrounded portions of the tape edge 12A and the material edge 14A. In addition, the tension of the needle thread 16 and the bobbin thread 20 acts so as to compress the portion of the tape edge 12A that is surrounded by the needle thread 16 and the bobbin thread 20. This consequently increases the density of the surrounded portion of the tape edge 12A. Moreover, the tension of the needle thread 18 and the bobbin thread 20 acts so as to compress the portion of the material edge 14A that is surrounded by the needle thread 18 and the bobbin thread 20. This consequently increases the density of the surrounded portion of the material edge 14A.

[0052] Since the density of the stitched portion of the sewn product 100 according to this embodiment is increased by being compressed with three needle threads 16, 18 and 22 and one bobbin thread 20 at three positions, including the center and both sides in the width direction, the tensile strength of the stitched portion can be increased than that of the sewn product 10 according to the above-described embodiment. The sewn product 100 may be made using three sewing needles in the similar method as in the sewn product 10 as described above.

[0053] Although some embodiments of the present invention have been described, these embodiments are provided only for better understanding of the invention but not intended to limit the interpretation of the invention. The invention can be altered and improved without departing from the purpose thereof, and includes equivalents thereof. For example, in the above-described embodiment, the tape edge 12A of the fastener tape 12 and the material edge 14A of the main material 14 that is thicker than the fastener tape 12 are stitched together, but the main material 14 may be thinner than the fastener tape 12. In this case, the feed rate of the fastener tape 12 is set to be slightly higher than that of the main material 14 while they are pressed at an equal pressure. In addition, in the sewn product 10 according to the above

embodiment, although the turning points 16A and 18A are disposed on the boundary line L of the tape edge 12A and the material edge 14A, the turning points 16A and 18A may be disposed on the tape edge 12A or on the material edge 14A.

DESCRIPTION OF REFERENCE NUMBERS

[0054]

1, 2	sewing needle
3	throat plate
4	vertical full rotation shuttle
10	sewn product
12	fastener tape
12A	tape edge
14	main material
14A	material edge
15	element
16	needle thread
16A, 16B	turning point
18	needle thread
18A, 18B	turning point
20	bobbin thread
22	needle thread
22A, 22B	turning point
30	material presser
32a, 32b	material press part
40a, 41a, 40b, 41b	feed dog
100	sewn product

Claims

1. A sewing method of material in which an edge (12A) of a first material (12) and an edge (14A) of a second material (14) are stitched together in an abutted state,

wherein the edge of the first material and the edge of the second material are stitched together with one bobbin thread (20) and a plurality of needle threads (16, 18, 22), the plurality of the needle threads being interlocked with the one bobbin thread to form a plurality of rows of zigzag stitched seams,

characterized in that the second material (14) is thicker than the first material (12), wherein the first material and the second material are respectively fed with feed dogs (40a, 41a; 40b, 41b) that are set at different feed rates, while the first and second materials are pressed at an equal pressure.

2. The sewing method of material according to claim 1, wherein the edge of the first material and the edge of the second material are stitched together with using a sewing machine which comprises a vertical full rotation shuttle (4) and a plurality of sewing needles (1, 2), wherein the plurality of sewing needles are arranged in a direction perpendicular to a feed direction of the first and second materials and sway in the direction perpendicular to the feed direction.
3. The sewing method of material according to claim 1, wherein the feed rate of the feed dog (40b, 41b) for feeding the second material (14) is set to be higher than the feed rate of the feed dog (40a, 41a) for feeding the first material (12).
4. The sewing method of material according to claim 1, wherein the first material (12) is a fastener tape to which elements (15) are attached.
5. The sewing method of material according to claim 1, wherein a length of the fastener tape (12) in a width direction is twice to four times of a length of the elements in a width direction.
6. A sewn product in which an edge (12A) of a first material (12) and an edge (14A) of a second material (14) are

stitched together in an abutted state,

wherein the edge of the first material and the edge of the second material are stitched together with one bobbin thread (20) and a plurality of needle threads (16, 18, 22), the plurality of needle threads being interlocked with the one bobbin thread to form a plurality of rows of zigzag stitched seams,

characterized in that the second material (14) is thicker than the first material (12), wherein the first material is a fastener tape to which elements (15) are attached, and wherein a length of the fastener tape in a width direction is twice to four times of a length of the elements in the width direction.

7. The sewn product according to claim 6,

wherein two rows of the zigzag stitched seams are formed by two needle threads (16, 18), and wherein the edge (12A) of the first material (12) is overedge-stitched by one (16) of the two needle threads and the bobbin thread (20), and the edge (14A) of the second material (14) is overedge-stitched by the other (18) of the two needle threads (16, 18) and the bobbin thread (20).

8. The sewn product according to claim 6,

wherein three rows of the zigzag stitched seams are formed by three needle threads, wherein one (22) of the three needle threads (16, 18, 22) is stitched alternately to the edge (12A) of the first material (12) and the edge (14A) of the second material (14), and wherein the other two (16, 18) of the three needle threads (16, 18, 22) are stitched to the edge (12A) of the first material (12) or the edge (14A) of the second material (14) at both sides of the one needle thread (22).

Patentansprüche

1. Nähverfahren für Material, bei dem eine Kante (12A) eines ersten Materials (12) und eine Kante (14A) eines zweiten Materials (14) in einem anstoßenden Zustand zusammengenäht werden, wobei die Kante des ersten Materials und die Kante des zweiten Materials mit einem Unterfaden (20) und einer Mehrzahl von Oberfäden (16, 18, 22) zusammengenäht werden, wobei die Mehrzahl von Oberfäden mit dem einem Unterfaden verriegelt wird, um eine Mehrzahl von Reihen mit im Zickzack genähten Nähten zu bilden, **dadurch gekennzeichnet, dass** das zweite Material (14) dicker ist als das erste Material (12), wobei das erste Material und das zweite Material jeweils mit Transporteuren (40a, 41a; 40b, 41b), die auf unterschiedliche Zufuhrgeschwindigkeiten eingestellt sind, zugeführt werden, während das erste Material und das zweite Material mit gleichem Druck angedrückt werden.
2. Nähverfahren für Material gemäß Anspruch 1, wobei die Kante des ersten Materials und die Kante des zweiten Materials mit Hilfe einer Nähmaschine, die einen vertikalen, vollständig drehbaren Schlitten (4) und eine Mehrzahl von Nähnadeln (1, 2) umfasst, zusammengenäht werden, wobei die Mehrzahl von Nähnadeln in einer rechtwinklig zu einer Zufuhrrichtung des ersten und des zweiten Materials verlaufenden Richtung ausgerichtet ist und in der rechtwinklig zu der Zufuhrrichtung verlaufenden Richtung schwankt.
3. Nähverfahren für Material gemäß Anspruch 1, wobei die Zufuhrgeschwindigkeit des Transporteurs (40b, 41b) zum Zuführen des zweiten Materials (14) derart eingestellt ist, dass sie höher als die Zufuhrgeschwindigkeit des Transporteurs (40a, 41a) zum Zuführen des ersten Materials (12) ist.
4. Nähverfahren für Material gemäß Anspruch 1, wobei es sich bei dem ersten Material (12) um ein Reißverschluss-tragband, an dem Kuppelglieder (15) befestigt sind, handelt.
5. Nähverfahren für Material gemäß Anspruch 1, wobei die Länge des Reißverschluss-tragbands (12) in einer Richtung der Breite zwei bis vier mal die Länge der Kuppelglieder in einer Richtung der Breite beträgt.
6. Genähtes Produkt, bei dem eine Kante (12A) eines ersten Materials (12) und eine Kante (14A) eines zweiten Materials (14) in einem anstoßenden Zustand zusammengenäht werden, wobei die Kante des ersten Materials und die Kante des zweiten Materials mit einem Unterfaden (20) und einer Mehrzahl von Oberfäden (16, 18, 22) zusammengenäht werden, wobei die Mehrzahl von Oberfäden mit dem einem Unterfaden verriegelt wird, um eine Mehrzahl von Reihen mit

im Zickzack genähten Nähten zu bilden,

dadurch gekennzeichnet, dass das zweite Material (14) dicker ist als das erste Material (12), wobei es sich bei dem ersten Material um ein Reißverschlussband, an dem Kuppelglieder (15) befestigt sind, handelt, und wobei die Länge des Reißverschlussbands in einer Richtung der Breite zwei bis vier mal die Länge der Kuppelglieder in einer Richtung der Breite beträgt.

7. Genähtes Produkt gemäß Anspruch 6, wobei zwei Reihen mit im Zickzack genähten Nähten durch zwei Oberfäden (16, 18) gebildet werden, und
wobei die Kante (12A) des ersten Materials (12) mit einem (16) der beiden Oberfäden und dem Unterfaden (20) mit einem Überwendlingstich genäht wird, und die Kante (14A) des zweiten Materials (14) mit dem anderen (18) der beiden Oberfäden (16, 18) und dem Unterfaden (20) mit einem Überwendlingstich genäht wird.
8. Genähtes Produkt gemäß Anspruch 6, wobei drei Reihen mit im Zickzack genähten Nähten durch drei Oberfäden gebildet werden,
wobei einer (22) der drei Oberfäden (16, 18, 22) abwechselnd an die Kante (12A) des ersten Materials (12) und die Kante (14A) des zweiten Materials (14) genäht wird, und wobei die anderen beiden (16, 18) der drei Oberfäden (16, 18, 22) an die Kante (12A) des ersten Materials (12) oder die Kante (14A) des zweiten Materials (14) an beiden Seiten des einen Oberfadens (22) genäht werden.

Revendications

1. Procédé de couture d'étoffe dans lequel un bord (12A) d'une première étoffe (12) et un bord (14A) d'une deuxième étoffe (14) sont cousus ensemble bord à bord,
ledit bord de la première étoffe et ledit bord de la deuxième étoffe étant cousus ensemble au moyen d'un même fil de bobine (20) et d'une pluralité de fils d'aiguille (16, 18, 22), la pluralité de fils d'aiguille étant entrelacés avec ledit un fil de bobine pour former une pluralité de rangées de coutures en zigzag,
caractérisé en ce que la deuxième étoffe (14) est plus épaisse que la première étoffe (12), ladite première étoffe et ladite deuxième étoffe étant respectivement amenées par des griffes d'entraînement (40a, 41a ; 40b, 41b) réglées à des vitesses d'amenée différentes, tandis que lesdites première et deuxième étoffes sont compressées à égale pression.
2. Procédé de couture d'étoffe selon la revendication 1, dans lequel le bord de la première étoffe et le bord de la deuxième étoffe sont cousus ensemble à l'aide d'une machine à coudre comprenant une navette totalement rotative verticale (4) et une pluralité d'aiguilles à coudre (1, 2), ladite pluralité d'aiguilles à coudre étant agencée dans un sens perpendiculaire au sens d'amenée des première et deuxième étoffes et se balançant dans le sens perpendiculaire au sens d'amenée.
3. Procédé de couture d'étoffe selon la revendication 1, dans lequel la vitesse d'amenée de la griffe d'entraînement (40b, 41b) permettant d'amener la deuxième étoffe (14) est supérieure à la vitesse d'amenée de la griffe d'entraînement (40a, 41a) permettant d'amener la première étoffe (12).
4. Procédé de couture d'étoffe selon la revendication 1, dans lequel la première étoffe (12) est une bande de fermeture à glissière à laquelle sont fixés des éléments (15).
5. Procédé de couture d'étoffe selon la revendication 1, dans lequel la longueur de la bande de fermeture à glissière (12) dans le sens de la largeur fait deux à quatre fois la longueur des éléments dans le sens de la largeur.
6. Produit cousu dans lequel un bord (12A) d'une première étoffe (12) et un bord (14A) d'une deuxième étoffe (14) sont cousus ensemble bord à bord,
ledit bord de la première étoffe et ledit bord de la deuxième étoffe étant cousus ensemble au moyen d'un même fil de bobine (20) et d'une pluralité de fils d'aiguille (16, 18, 22), la pluralité de fils d'aiguille étant entrelacés avec ledit un fil de bobine pour former une pluralité de rangées de coutures en zigzag,
caractérisé en ce que la deuxième étoffe (14) est plus épaisse que la première étoffe (12), ladite première étoffe étant une bande de fermeture à glissière à laquelle sont fixés des éléments (15), la longueur de la bande de fermeture à glissière dans le sens de la largeur faisant deux à quatre fois la longueur des éléments dans le sens de la largeur.
7. Produit cousu selon la revendication 6, dans lequel deux rangées de coutures en zigzag sont formées par deux fils

d'aiguille (16, 18), et

le bord (12A) de la première étoffe (12) étant cousu à point de surjet par l'un (16) des deux fils d'aiguille et le fil de bobine (20), et le bord (14A) de la deuxième étoffe (14) étant cousu à point de surjet par l'autre (18) des deux fils d'aiguille (16, 18) et le fil de bobine (20).

5

8. Produit cousu selon la revendication 6, dans lequel trois rangées de coutures en zigzag sont formées par trois fils d'aiguille,

l'un (22) des trois fils d'aiguille (16, 18, 22) étant piqué alternativement sur le bord (12A) de la première étoffe (12) et le bord (14A) de la deuxième étoffe (14), et les deux autres (16, 18) des trois fils d'aiguille (16, 18, 22) étant piqués sur le bord (12A) de la première étoffe (12) ou le bord (14A) de la deuxième étoffe (14) des deux côtés dudit un fil d'aiguille (22).

10

15

20

25

30

35

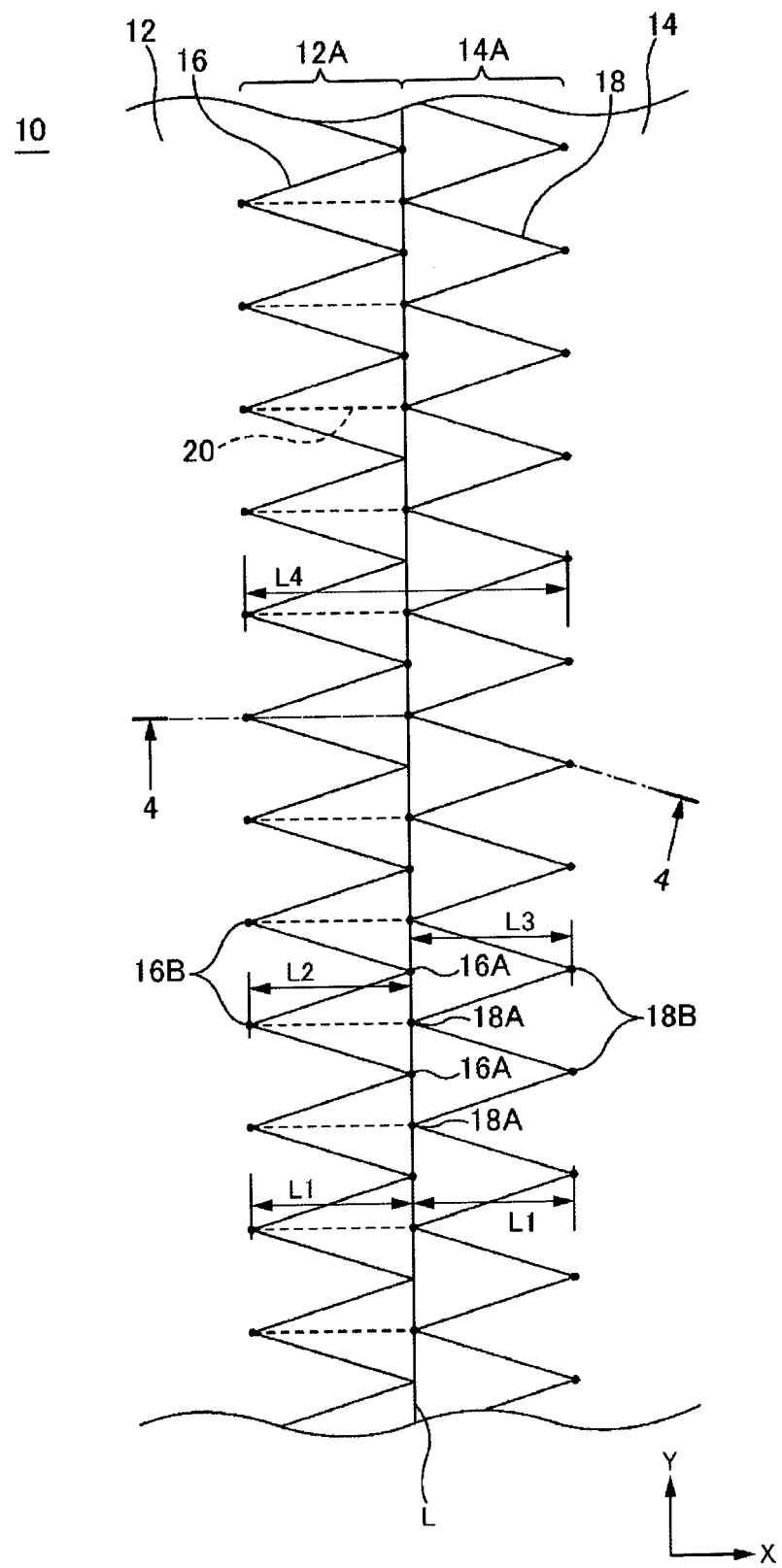
40

45

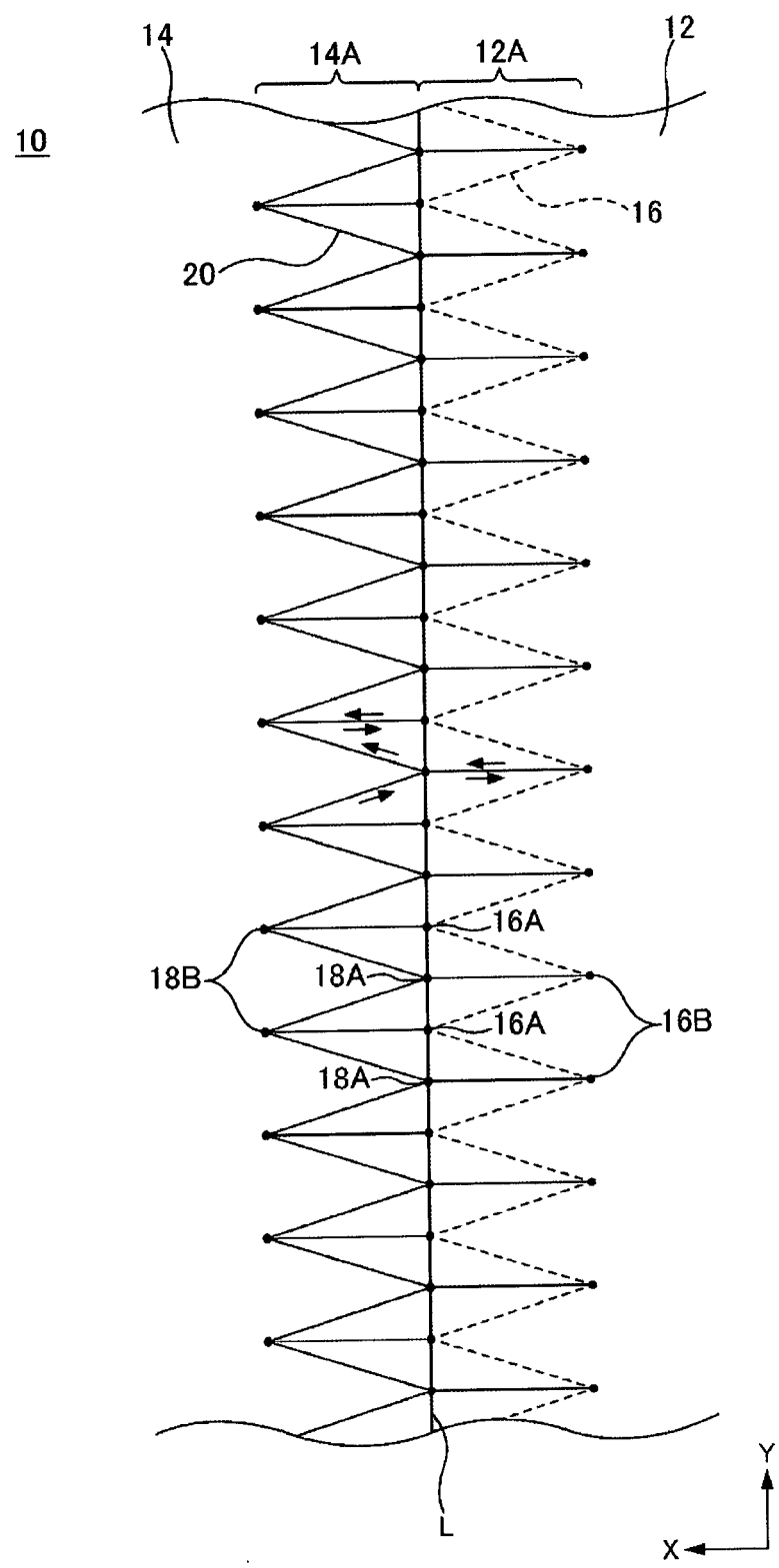
50

55

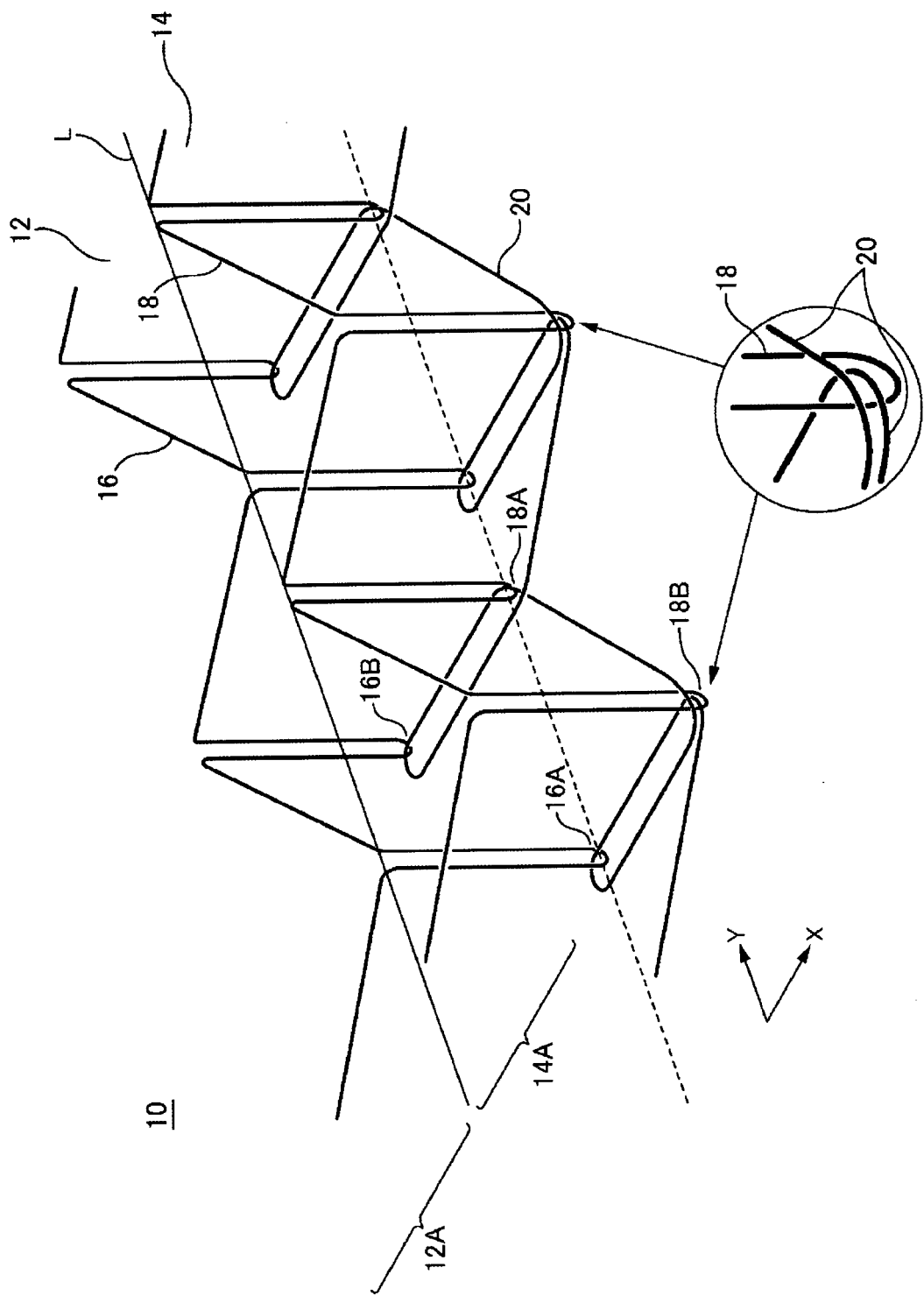
【FIG.1】



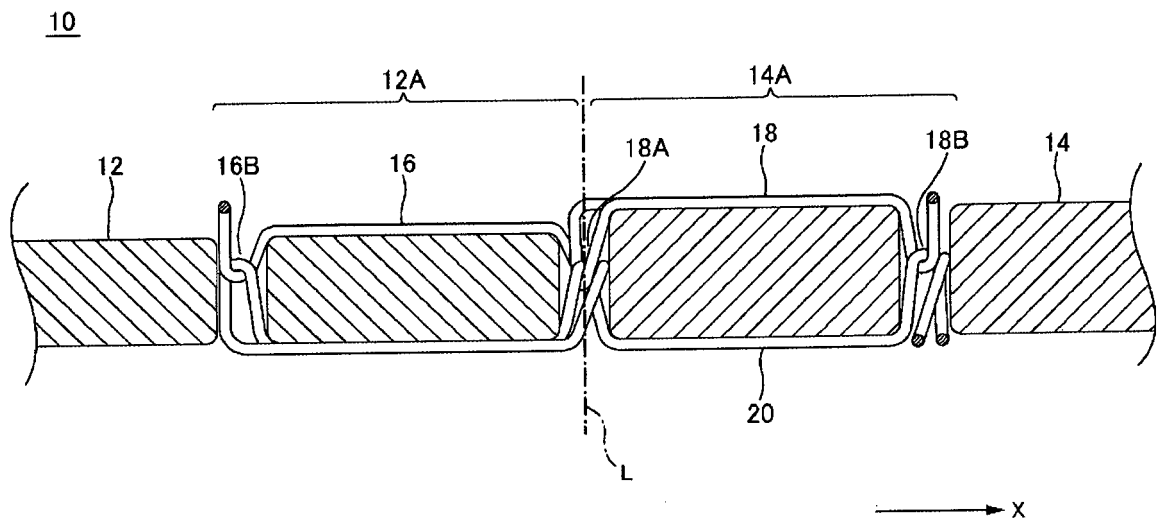
【FIG.2】



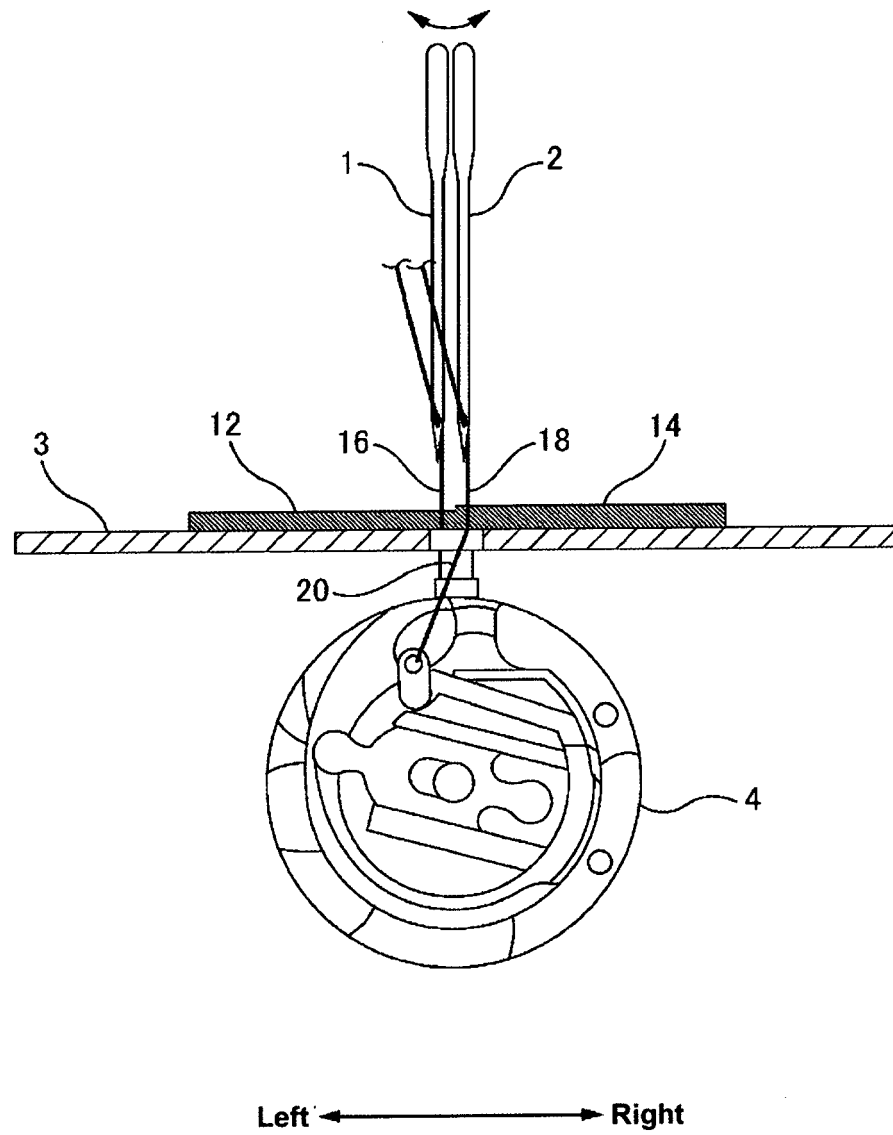
【FIG.3】



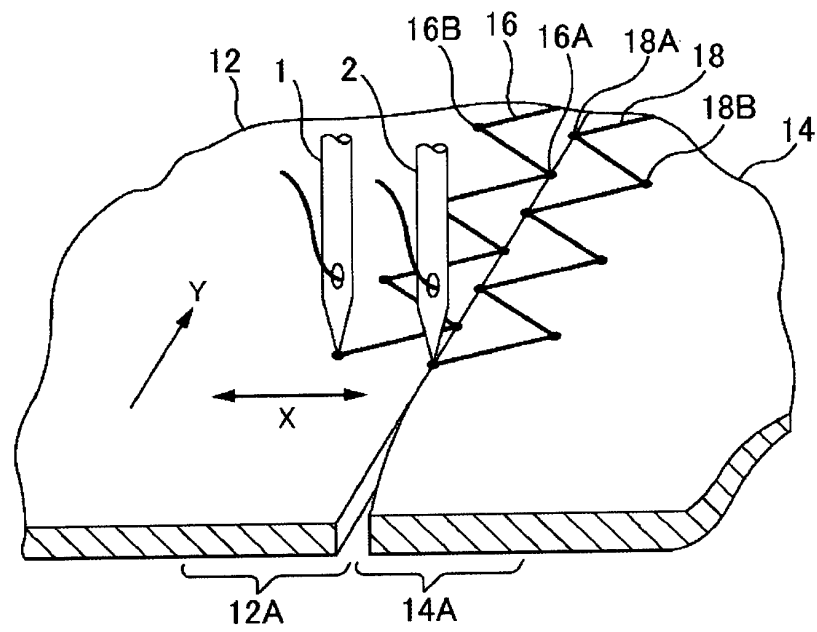
【FIG.4】



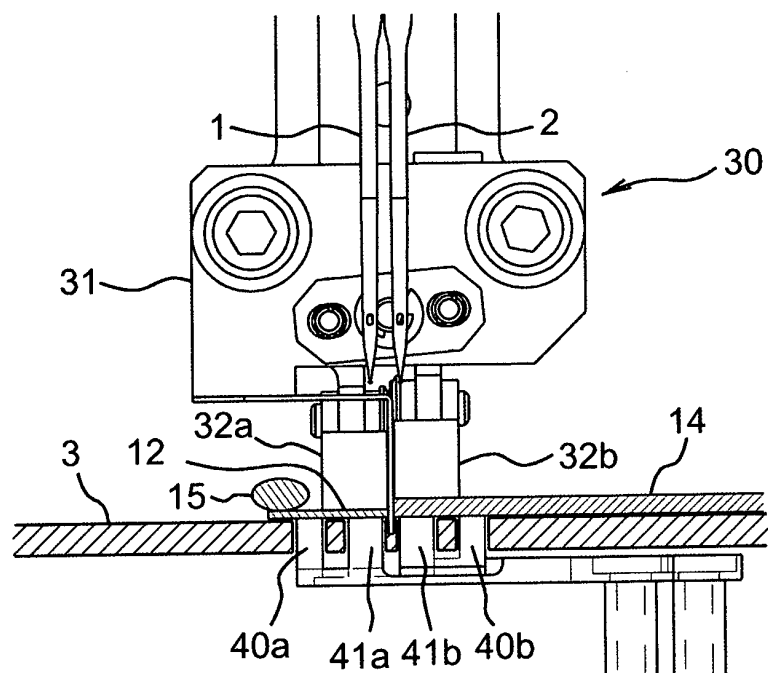
【FIG.5】



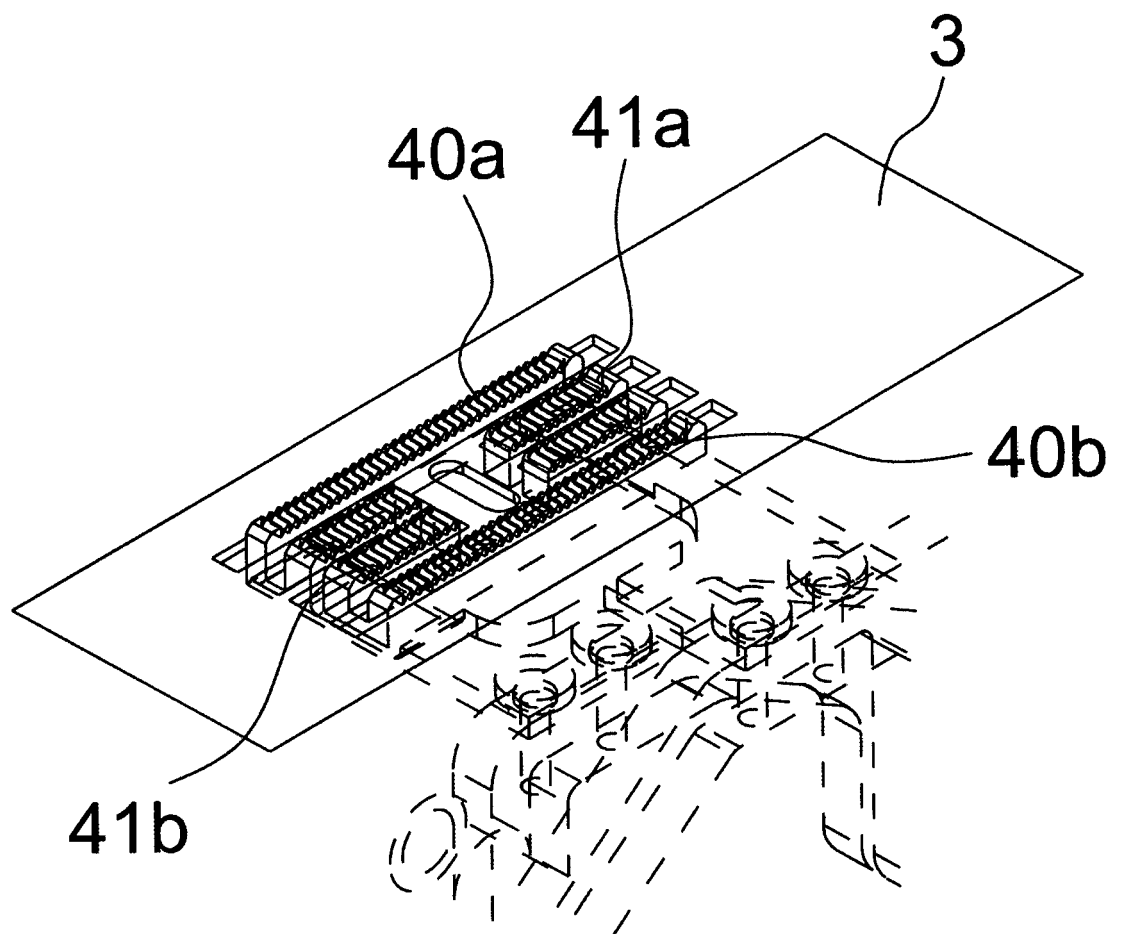
【FIG.6】



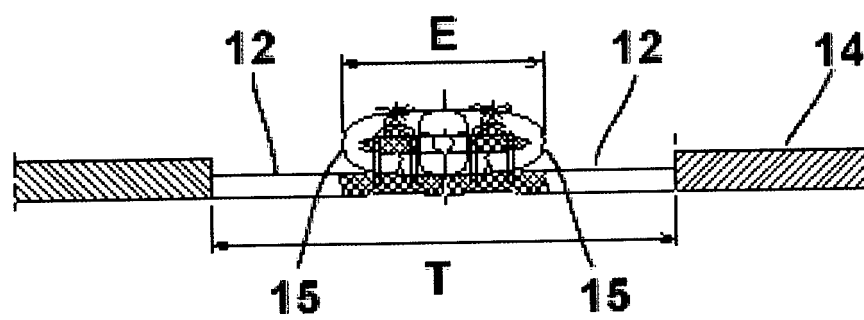
【FIG.7】



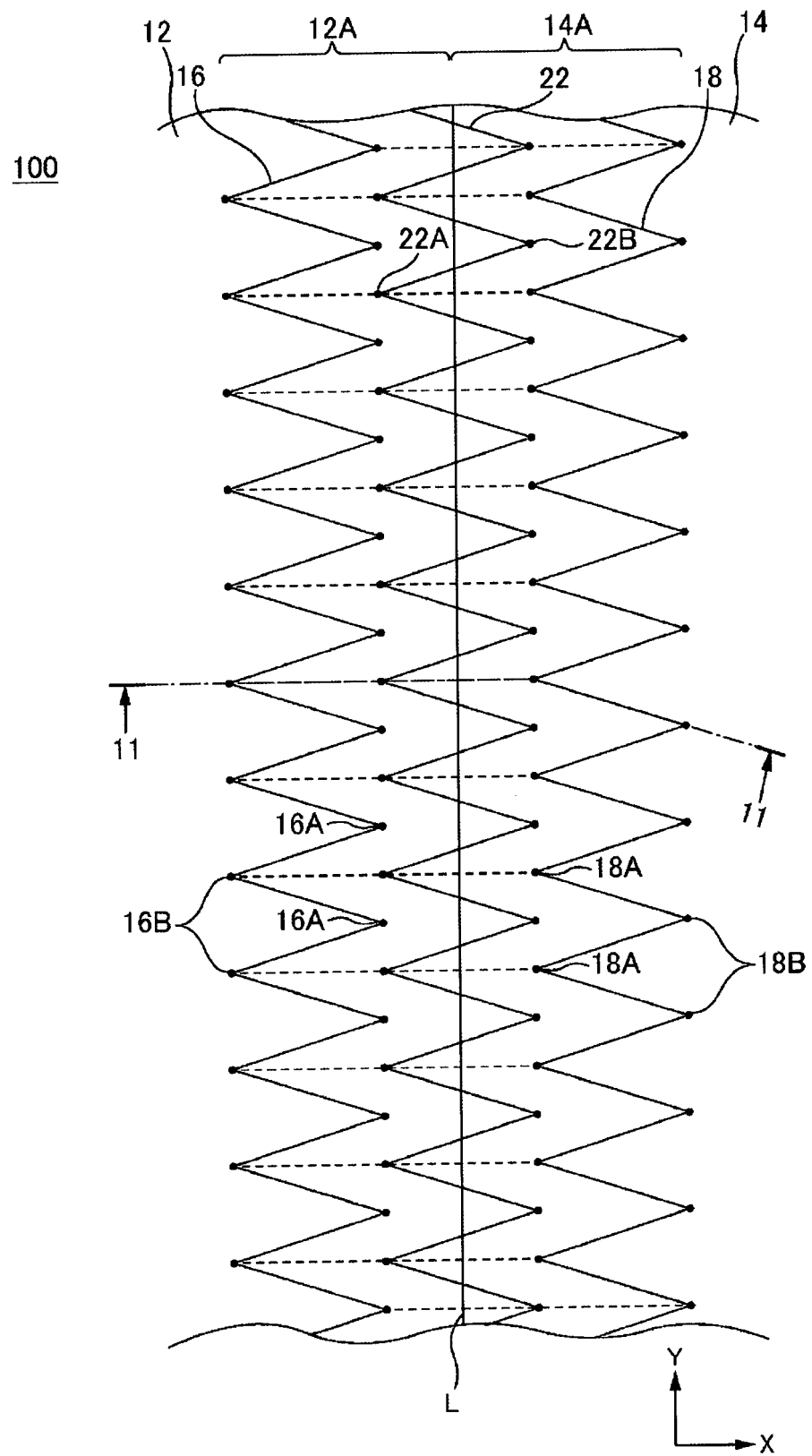
【FIG.8】



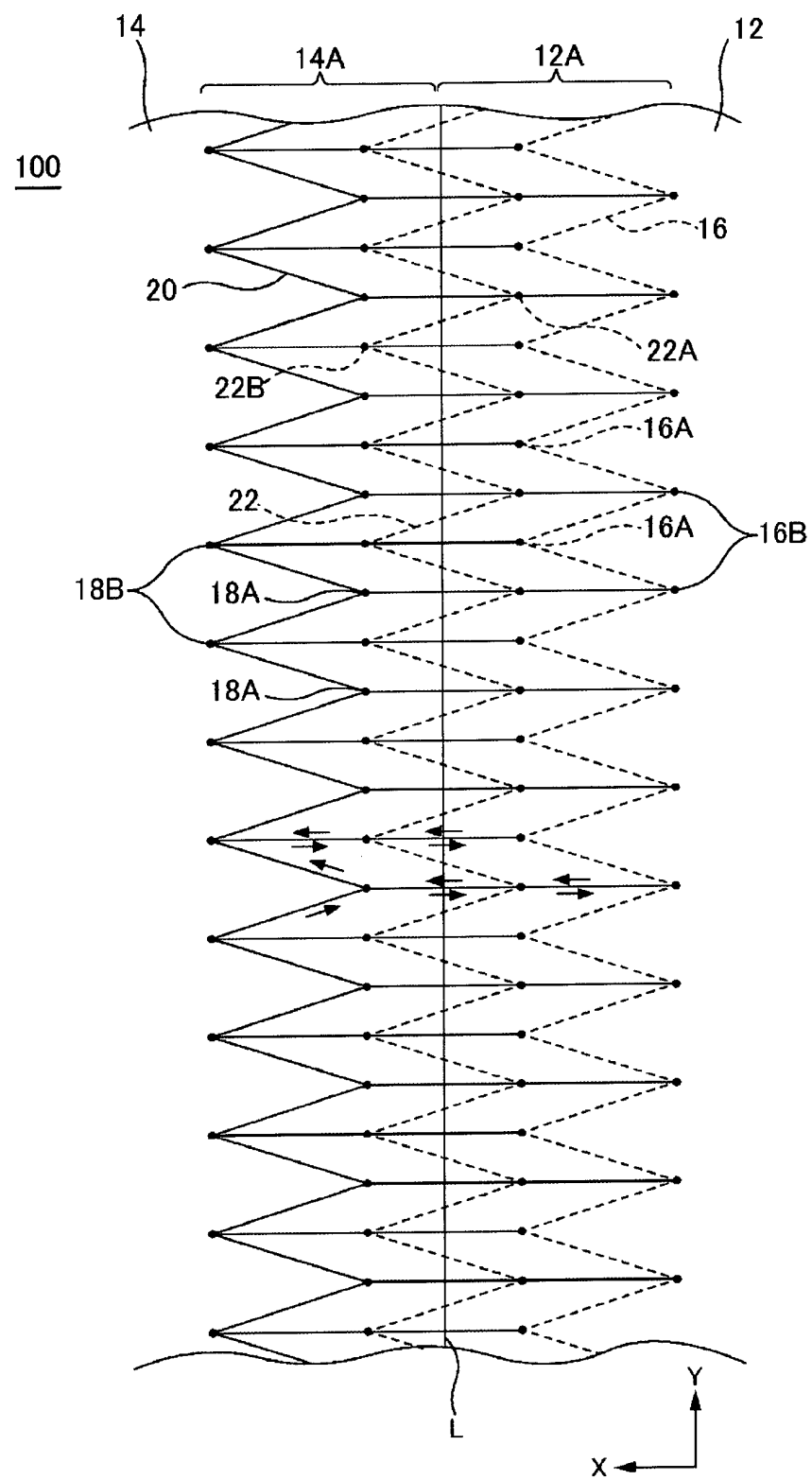
【FIG.9】



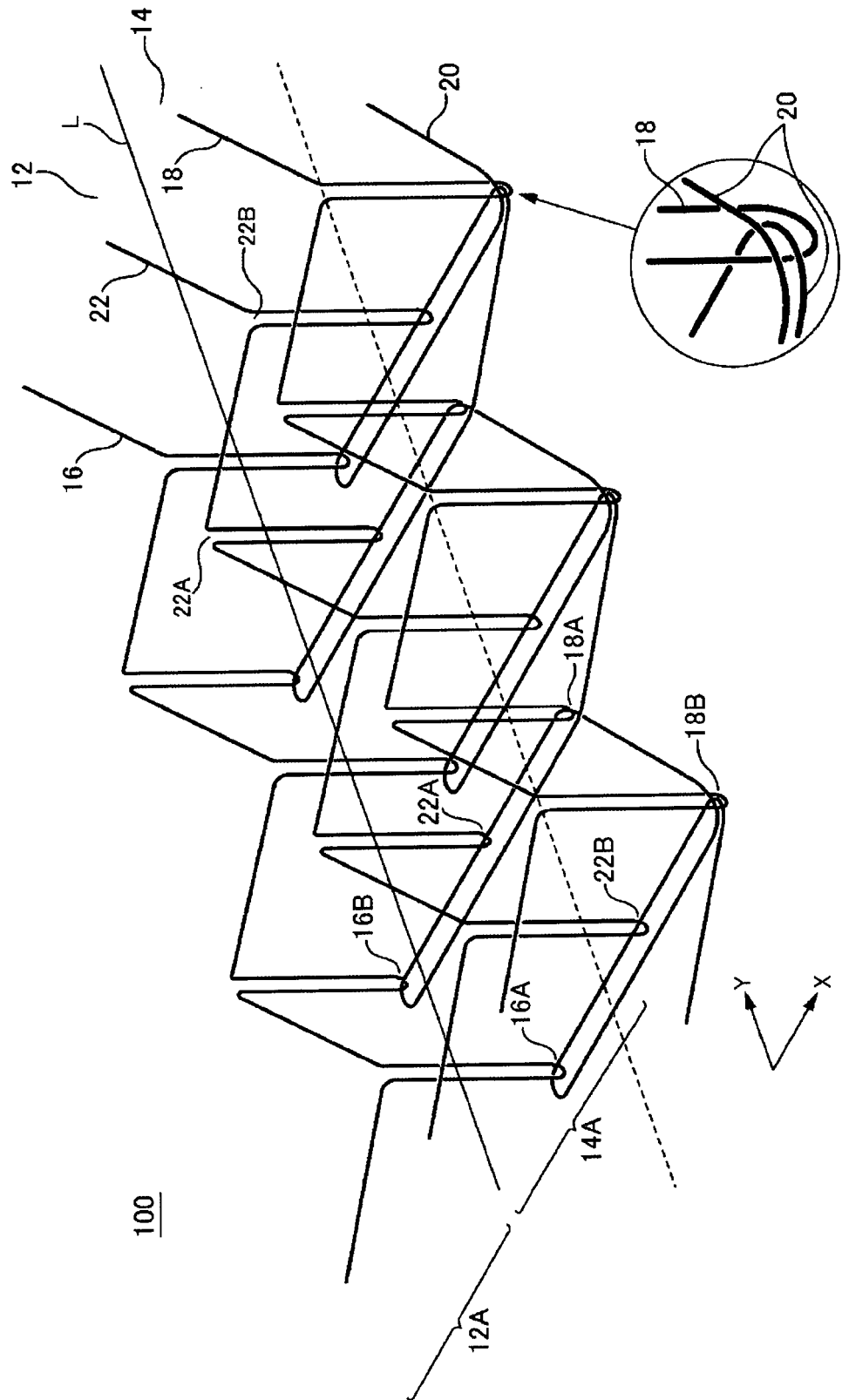
【FIG.10】



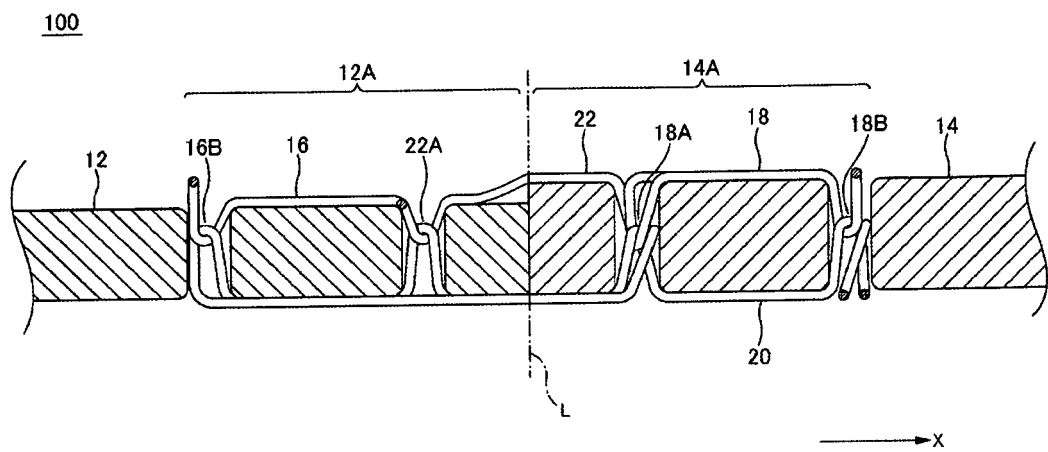
【FIG.11】



【FIG.12】



【FIG.13】



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 5341961 B [0004] [0005]
- JP 2000197783 A [0005]
- JP S5617112 B [0041]
- JP H3191984 A [0042]