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(54) DOUBLE-SIDED FABRIC COMPRISING A STITCHED SACK HAVING AN INTERLAYER STACKED WITH CONTINUOUS CORD MATERIAL TO FROM AN AREA OF HIGH THICKNESS

(57) A double-sided fabric stacked with a continuous cord material (100) and forming a thickness in a stitched sack comprising an interlayer (200) is stitched from a face yarn (20) by a flat knitting machine including a front needle bed, a back needle bed and a loop presser bed. The front needle bed includes a plurality of front knitting needles (A to E). The back needle bed includes a plurality of back knitting needles (a to f). The loop presser bed is disposed above the front or back needle bed, and includes right-directed and left-directed stitching pressing pieces (aA, bB, cC, dD and eE and Ef, De, Cd, Bc and Ab). The double-sided fabric further includes at least one stitched sack comprising an interlayer (200) including loops stitched from the face yarn (20) by the front and back knitting needles. The stitched sack comprising an interlayer (200) includes therein at least one continuous cord material (100), which is pressed into the stitched sack comprising an interlayer (200) by the right-directed and left-directed stitching pressing pieces to become folded and stacked to form a thickness.

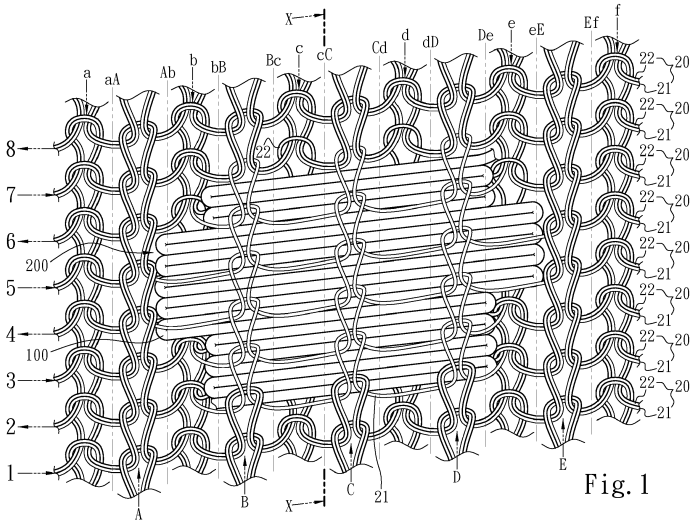

Fig. 1

EP 3 263 755 A1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a double-sided fabric, and particularly to a double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer.

BACKGROUND OF THE INVENTION

[0002] In the modem society that values health, environmental protection and fashion, consumers demand higher comfort and design requirements on garment fabrics. In response to market needs of human wear, fabric manufacturers focus on making fabrics of different colors and pattern changes. If a continuous cord material can be embedded into a double-sided base yarn during a weaving process and be woven at the same time, not only a thicker and denser double-sided fabric having more pattern changes can be formed, but also the double-sided fabric manufactured may achieve more outstanding performances in fluffiness and shape sustainability. Such fabric is particularly suitable for making daily life consumer products including human outerwear, shoes or handbags. In currently existing technologies associated with a flat bed knitting machine that embeds a continuous cord material to be embedded, the embedding process of the continuous cord material to be embedded is performed by yarn stitching operations using knitting needles. Thus, when the length of the continuous cord material to be embedded exceeds 1 inch, due a certain inclined angle produced when the continuous cord material is fed by a yarn feeder, the continuous cord material may not be reliably stitched by the knitting needle in the yarn stitching process, hence easily resulting in an unsatisfactory fabric. That is to say, when adopting the above technology for embedding the continuous cord material, the length of the continuous cord material cannot exceed 1 inch. Thus, the development of fabrics manufactured from the above weaving technology also suffers from severe restrictions. It should be noted that, the flat bed knitting machine described refers to a model that includes a front needle bed and a back needle bed. During a weaving process, such flat bed knitting machine is capable of manufacturing not only a single-sided fabric by independently using one of the needle beds but also a double-sided fabric by simultaneously using the front and back needle beds that weave alternately.

[0003] One of current technologies is as disclosed by the Taiwan Utility Model Patent No. M317443, "The Textile with Three Different Thickness Fibers". The above disclosure discloses a three-fiber fabric having different thicknesses including an upper fabric layer, a low fabric layer and a hard yarn thick layer. The lower fabric layer is partially tightened and connected to the upper fabric layer to be spaced to form a thin layer region. The hard yarn thick layer is a formed integral, and is spaced and disposed between the upper fabric layer and the lower fabric layer, and is adjacent to the thin layer region. Because the hard yarn thick layer is capable of supporting the upper fabric layer and the lower fabric layer, a certain thickness can be maintained. Further, as the thin layer region is tightened and connected to the upper fabric layer and the lower fabric layer, the thickness of the that region is thinner than that of the hard yarn thick layer. However, as seen from the above disclosure, the primary object of the three-fiber fabric with different thicknesses is forming a fabric evenly distributed with different thicknesses and shapes by directly weaving the three fibers, so as to save processing time and manpower and thus reducing production costs. It is known that, the primary object of the three-fiber fabric woven by the above disclosure is weaving the fibers into a fabric evenly distributed with different thicknesses and shapes. That is to say, the fabric of the above disclosure does not provide a technical solution that allows setting the number of times of stacks at a predetermined position according to a required thickness as desired. Thus, the three-fiber fabric of the above disclosure does not satisfy market needs. Therefore, there is a need for a solution that overcomes drawbacks and limitations of the above disclosure.

SUMMARY OF THE INVENTION

[0004] Therefore, it is a primary object of the present invention to provide a solution for overcoming the drawbacks of the above disclosure.

[0005] This problem is solved by a double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer as claimed in claim 1 and by a corresponding method for producing such a double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer. Further advantageous embodiments are the subject-matter of the dependent claims.

[0006] In addition to embedding a continuous cord material into a woven sack interlayer of a double-sided fabric in a weaving process, the present invention causes the continuous cord material to stack and form a thickness in the woven sack interlayer, so as to weave a double-sided fabric appearing relief embossed and having different thicknesses. Thus, the doubled-sided fabric stacked with the continuous cord material and forming a thickness in the woven sack interlayer according to the present invention not only effectively satisfies consumer market needs, but also reduces manpower and time costs as well as effectively enhancing production efficiency.

[0007] According to the above object, the present invention provides a double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer. The double-side fabric is woven from a face yarn by a flat bed knitting machine, which includes a front needle bed, a back needle bed, and a loop presser bed. The front needle bed includes a plu-

rality of front knitting needles. The back needle beds includes a plurality of back knitting needles at corresponding positions staggered from the front knitting needles. The loop presser bed is above the front needle bed or the back needle bed, and includes a plurality of right-directed weaving pressing pieces and left-directed weaving pressing pieces alternately arranged in gaps of the plurality of front knitting needles and the plurality of back knitting needles, respectively. The double-sided fabric further includes a woven sack interlayer formed from loops stitched from the face yarn by the plurality of front knitting needles and the plurality of back knitting needles. The woven sack interlayer includes therein at least one continuous cord material, which is pressed into the woven sack interlayer by the plurality of right-directed weaving pressing pieces and the plurality of left-directed weaving pressing pieces to become folded and stacked to form a thickness.

[0008] According to a further embodiment, in the double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer, the continuous cord material is guided and fed in from the front needle bed towards the double-sided fabric, and guided towards the front needle bed to depart the double-sided fabric.

[0009] According to a further embodiment, in the double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer, the continuous cord material is guided and fed in from the front needle bed towards the double-sided fabric, and guided towards the back needle bed to depart the double-sided fabric.

[0010] According to a further embodiment, in the double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer, the continuous cord material is guided and fed in from the back needle bed towards the double-sided fabric, and guided towards the back needle bed to depart the double-sided fabric.

[0011] According to a further embodiment, in the double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer, the continuous cord material is guided and fed in from the back needle bed towards the double-sided fabric, and guided towards the front needle bed to depart the double-sided fabric.

[0012] According to a further embodiment, in the double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer, the thread diameter of the continuous cord material is greater than the thread diameter of the face yarn.

[0013] It is known from the above technical solution that, the present invention achieves following effects compared to the prior art. First of all, in the present invention, the continuous cord material is stacked in the woven sack interlayer of the double-sided fabric, such that the double-sided fabric may offer preferred thickness and piling effect. Secondly, in the present invention, the continuous cord material may be stacked in the woven sack interlayer according to an operator setting and form a required thickness, so as to manufacture a double-sided fabric appearing relief embossed and having different thicknesses for effectively satisfying consumer market needs. Thirdly, in the present invention, as the weaving process of the continuous cord material is added into the woven sack interlayer, a post procedure of adding a filler material can be eliminated to reliably reduce manpower and time costs and effectively enhance production efficiency.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

Fig. 1 is a partial planar structural schematic diagram according to a first preferred embodiment of the present invention;

Fig. 2 is a partial section diagram of Fig. 1;

Fig. 3 is a schematic diagram of Fig. 2, with the continuous cord material removed;

Fig. 4 is a planar section schematic diagram along a direction X-X in Fig. 1;

Fig. 5 is a diagram of partial weaving processes in Fig. 1;

Fig. 6 is a weaving process diagram between the weaving process 2 and the weaving process 3 in Fig. 5;

Fig. 7 is a weaving process diagram between the weaving process 3 and the weaving process 4 in Fig. 5;

Fig. 8 is a weaving process diagram between the weaving process 4 and the weaving process 5 in Fig. 5;

Fig. 9 is a weaving process diagram between the weaving process 5 and the weaving process 6 in Fig. 5;

Fig. 10 is a weaving process diagram between the weaving process 6 and the weaving process 7 in Fig. 5;

Fig. 11 is a partial planar structural schematic diagram according to a second preferred embodiment of the present invention;

Fig. 12 is a diagram of partial weaving processes in Fig. 11;

Fig. 13 is a weaving process diagram between the weaving process 4 and the weaving process 5 in Fig. 12;

Fig 14 is a weaving process diagram between the weaving process 5 and the weaving process 6 in Fig. 12;

Fig. 15 is a weaving process diagram between the weaving process 6 and the weaving process 7 in Fig. 12;

Fig. 16 is a partial planar structural schematic diagram according to a third preferred embodiment of the present invention;

Fig. 17 is a planar section schematic diagram along a direction Y-Y in Fig. 16;

Fig. 18 is a diagram of partial weaving processes in Fig. 16;

Fig. 19 is a weaving process diagram between the weaving process 4 and the weaving process 5 in Fig. 18;

Fig. 20 is a weaving process diagram between the weaving process 5 and the weaving process 6 in Fig. 18; and

Fig. 21 is a weaving process diagram between the weaving process 6 and the weaving process 7 in Fig. 18.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] First of all, it should be noted that a flat bed knitting machine described in the present invention is a known and market available model (model number: SVR093SP) made by Shima Seiki Mfg., Ltd, Japan. However, this model is not to be construed as a limitation to the present invention. As the above flat bed knitting machine is a technology generally known to one person skilled in the art, the structure of the flat bed knitting machine is described in brief in the application, and associated details and denotations are omitted herein. The flat bed knitting machine at least includes a front needle bed, a back needle bed, a loop presser bed, a carriage above the front needle bed, the back needle bed and the loop presser bed, and a plurality of yarn feeders between the front needle bed, the back needle bed and the loop presser bed. The front needle bed includes a plurality of front knitting needles. The back needle bed includes a plurality of back knitting needles at corresponding positions staggered from the front knitting needles. The loop presser bed is above the front needle bed or the back needle bed, and includes a plurality of right-directed weaving pressing pieces and a plurality of left-directed weaving pressing pieces correspondingly and alternately arranged in gaps of the plurality of front knitting needles and the plurality of back knitting needles, respectively.

[0016] Detailed technical contents of a double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer of the present invention are given in the non-limiting preferred embodiments below with reference to the accompanying drawings.

[0017] Fig. 1 to Fig. 5 show a partial planar structural schematic diagram, a partial section diagram, a schematic diagram with the continuous cord material removed, a planar section diagram along the direction X-X, and a diagram of partial weaving processes according to a first preferred embodiments of the present invention. Referring to Fig. 1 to Fig. 5, the present invention provides a double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer. The doubled-sided fabric is woven from a face yarn 20 (including a first face yarn 21 and a second face yarn 22 in one embodiment) by the above flat bed knitting machine. The front needle bed includes a plurality of front knitting needles A to E. The back needle bed includes a plurality of back knitting needles a to f at corresponding position staggered from the plurality of front knitting needles A to E. The loop presser bed is above the front needle bed or the back needle bed, and includes a plurality of right-directed weaving pressing pieces aA, bB, cC, dD and eE and a plurality of left-directed weaving pressing pieces Ef, De, Cd, Bc and Ab correspondingly alternately arranged in gaps of the plurality of front knitting needles A to E and the plurality of back knitting needles a to f, respectively. The double-sided fabric further includes a woven sack interlayer 200 formed from loops stitched from the first face yarn 21 and the second face yarn 22 by the plurality of front knitting needles A to E and the plurality of back knitting needles b to e. The woven sack interlayer 200 includes therein a continuous cord material 100, which is pressed into the woven sack interlayer 200 by the right-directed weaving pressing pieces bB, cC, dD and eE and the left-directed weaving pressing pieces De, Cd, Bc and Ab to become folded and stacked to form a thickness. It should be noted that, the continuous cord material 100 may be guided and fed in from the front needle bed towards the double-sided fabric, and guided towards the front needle bed to depart the double-sided fabric, or guided and fed in from the front needle bed towards the double-sided fabric, and guided towards the back needle bed to depart the double-sided fabric. Similarly, the continuous cord material 100 may be guided and fed in from the back needle bed towards the double-sided fabric, and guided towards the back needle bed to depart the double-sided fabric, or guided and fed in from the back needle bed towards the double-sided fabric, and guided towards the front needle bed to depart the double-sided fabric.

[0018] To better explain the present invention, refer to Fig. 5 to Fig. 10 showing diagrams of partial weaving processes and a weaving process of pressing in a continuous cord material according to the first preferred embodiment of the present invention. Also referring to Fig. 1 to Fig. 4, when the flat bed knitting machine applied in the present invention starts weaving along a carriage operation direction 30 to the right side as shown by the weaving process 1, the front knitting needles A to E and the back knitting needles a to f sequentially stitch the face yarn 20 (including a first face yarn 21 and a second face yarn 22) to form loops. After weaving is next performed along the carriage operation direction 30 to the left side, the first face yarn 21 and the second face yarn 22 are together sequentially stitched by the back knitting needle f, the front knitting needle E and the back knitting needle e. The front knitting needles D, C and B and the back knitting needles d and c are then controlled to sequentially stitch the first face yarn 21 and the second face yarn 22 separately to form loops. Next, from the back knitting needle b, the front knitting needle A to the back knitting

needle a, the first face yarn 21 and the second face yarn 22 are again together stitched to form loops, as shown by the weaving process 2 in Fig. 5. At this point, an initial weaving process of a woven sack interlayer 200 has begun. Referring to Fig. 6, at this point, the front knitting needles A to E and the back knitting needles a to f are controlled to stop weaving, a yarn feeder 10 is caused to guide and feed a continuous cord material 100 from between the front knitting needles A and B of the front needle bed and to guide from the left side to the right side above the loops formed in the weaving process 2, such that the carriage operation direction 30 moves to the right side along with the operation direction of the yarn feeder 10. Further, the right-directed weaving pressing pieces bB, cC and dD are controlled to sequentially press the continuous cord material 100 downwards into the initially formed woven sack interlayer 200, to cause to the yarn feeder 10 to stop guiding to the right side as reaching the back knitting needle e, as shown by the weaving process 2-1. Next, the yarn feeder 10 switches to guide the continuous cord material 100 to the left side to cause the continuous cord material 100 to be folded, and causes the carriage operation direction 30 to move to the left side along with the operation direction of the yarn feeder 10. Further, the left-directed weaving pressing pieces De, Cd and Bc are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200. When about to sequentially press downwards, before sequentially passing the right-directed weaving pressing pieces dD, cC and bB, the left-directed weaving pressing pieces De, Cd and Bc sequentially lift the right-directed weaving pressing pieces dD, cC and bB that then disengage from the continuous cord material 100. When the yarn feeder 10 reaches the back knitting needle b, the yarn feeder 10 stops guiding to the left side, as shown by the weaving process 2-2. Similarly, the yarn feeder 10 may keep guiding the continuous cord material 100 back and forth to the left and right sides, such that the continuous cord material 100 is continually pressed downwards to become stacked in the woven sack interlayer 200, until the thickness currently required by the shape of the woven sack interlayer 200 is achieved, i.e., equivalently till the number predetermined by the operator is reached, as shown by the weaving process 2-n (where n is a predetermined number greater than 2). It should be noted that, at this point, the woven sack interlayer 200 is in an initially woven shape and thus has a limited space for accommodating the continuous cord material 100. Therefore, the value n may be determined by the thickness of the continuous cord material 100, and the weaving process 2-2 to the weaving process 2-n may also be omitted. Again referring to Fig. 5, after weaving is again performed along the carriage operation direction 30 to the right side, the first face yarn 21 and the second face yarn 22 are together sequentially stitched by the back knitting needle a, the front knitting needle A and the back knitting needle e to form loops. The front knitting needles B, C and D and the back knitting needles c and d are then controlled to sequentially stitch the first face yarn 21 and the second face yarn 22 separately to form loops. Next, from the back knitting needle e, the front knitting needle E to the back knitting needle f, the first face yarn 21 and the second face yarn 22 are again together stitched to form loops, as shown by the weaving process 3 in Fig. 5. At this point, the woven sack interlayer 200 gradually expands. Referring to Fig. 7, similarly, the front knitting needles A to E and the back knitting needles a to f are controlled to stop weaving, and the yarn feeder 10 is caused to again guide and feed the continuous cord material 100 and to guide from the left side to the right side above the loops formed in the weaving process 3, such that the carriage operation direction 30 moves to the right side along with the operation direction of the yarn feeder 10. Further, the right-directed weaving pressing pieces bB, cC and dD are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200, to cause to the yarn feeder 10 to stop guiding to the right side as reaching the back knitting needle e, as shown by the weaving process 3-1. Next, the yarn feeder 10 switches to guide the continuous cord material 100 to the left side to cause the continuous cord material 100 to be folded, and causes the carriage operation direction 30 to move to the left side along with the operation direction of the yarn feeder 10. Further, the left-directed weaving pressing pieces De, Cd and Bc are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200. When about to sequentially press downwards, before sequentially passing the right-directed weaving pressing pieces dD, cC and bB, the left-directed weaving pressing pieces De, Cd and Bc sequentially lift the right-directed weaving pressing pieces dD, cC and bB that then disengage from the continuous cord material 100. When the yarn feeder 10 reaches the back knitting needle b, the yarn feeder 10 stops guiding to the left side, as shown by the weaving process 3-2. Similarly, the yarn feeder 10 may keep guiding the continuous cord material 100 back and forth to the left and right sides, such that the continuous cord material 100 is continually pressed downwards to become stacked in the woven sack interlayer 200, until the thickness currently required by the shape of the woven sack interlayer 200 is achieved, i.e., equivalently till the number predetermined by the operator is reached, as shown by the weaving process 3-n. Again referring to Fig. 5, after weaving is again performed along the carriage operation direction 30 to the left side, the first face yarn 21 and the second face yarn 22 are together sequentially stitched by the back knitting needle f and the front knitting needle E to form loops. The front knitting needles D, C and B and the back knitting needles e, d, c and b are controlled to sequentially stitch the first face yarn 21 and the second face yarn 22 separately to form loops. Next, from the front knitting needle A to the back knitting a, the first face yarn 21 and the second face yarn 22 are again together sequentially stitched to form loops,

as shown by the weaving process 4 in Fig. 5. At this point, the woven sack interlayer 200 is substantially formed. Referring to Fig. 8, at this point, the front knitting needles A to E and the back knitting needles a to f are controlled to stop weaving, and the yarn feeder 10 is caused to again guide and feed the continuous cord material 100 and to guide from the left side to the right side above the loops formed in the weaving process 4, such that the carriage operation direction 30 moves to the right side along with the operation direction of the yarn feeder 10. Further, the right-directed weaving pressing pieces bB, cC, dD and eE are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200, to cause to the yarn feeder 10 to stop guiding to the right side as reaching the front knitting needle E, as shown by the weaving process 4-1. Next, the yarn feeder 10 switches to guide the continuous cord material 100 to the left side to cause the continuous cord material 100 to be folded, and causes the carriage operation direction 30 to again move to the left side along with the operation direction of the yarn feeder 10. Further, the left-directed weaving pressing pieces De, Cd, Bc and Ab are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200. When about to sequentially press downwards, before sequentially passing the right-directed weaving pressing pieces eE, dD, cC and bB, the left-directed weaving pressing pieces De, Cd, Bc and Ab sequentially lift the right-directed weaving pressing pieces eE, dD, cC and bB that then disengage from the continuous cord material 100. When the yarn feeder 10 reaches the back knitting needle a, the yarn feeder 10 stops guiding to the left side, as shown by the weaving process 4-2. Next, the yarn feeder 10 switches to guide the continuous cord material 100 to the right side to cause the continuous cord material 100 to be folded, and causes the carriage operation direction 30 to move to the right side along with the operation direction of the yarn feeder 10. Further, the right-directed weaving pressing pieces aA, bB, cC, dD and eE are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200. When about to sequentially press downwards, before sequentially passing the left-directed weaving pressing pieces Ab, Bc, Cd and De, the right-directed weaving pressing pieces aA, bB, cC, dD and eE sequentially lift the left-directed weaving pressing pieces Ab, Bc, Cd and De that then disengage from the continuous cord material 100. When the yarn feeder 10 reaches the front knitting needle E, the yarn feeder 10 stops guiding to the right side, as shown by the weaving process 4-3. Similarly, the yarn feeder 10 may keep guiding the continuous cord material 100 back and forth to the left and right sides, such that the continuous cord material 100 is continually pressed downwards to become stacked in the woven sack interlayer 200, until the thickness currently required by the shape of the woven sack interlayer 200 is achieved, i.e., equivalently till the number predetermined by the operator is reached, as shown by the weaving process 4-n. Again referring to Fig. 5, after weaving is again performed along the carriage operation direction 30 to the right side, the first face yarn 21 and the second face yarn 22 are together sequentially stitched by the back knitting needle a and the front knitting needle A to form loops. The front knitting needles B, C and D and the back knitting needles b, c d and e are then controlled to sequentially stitch the first face yarn 21 and the second face yarn 22 separately to form loops. Next, from the front knitting needle E to the back knitting needle f, the first face yarn 21 and the second face yarn 22 are again together stitched to form loops, as shown by the weaving process 5 in Fig. 5. At this point, the woven sack interlayer 200 is fully shaped. Referring to Fig. 9, similarly, the front knitting needles A to E and the back knitting needles a to f are controlled to stop weaving, and the yarn feeder 10 is caused to again guide and feed the continuous cord material 100 and to guide from the left side to the right side above the loops formed in the weaving process 5, such that the carriage operation direction 30 moves to the right side along with the operation direction of the yarn feeder 10. Further, the right-directed weaving pressing pieces bB, cC, dD and eE are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200, to cause to the yarn feeder 10 to stop guiding to the right side as reaching the front knitting needle E, as shown by the weaving process 5-1. Next, the yarn feeder 10 switches to guide the continuous cord material 100 to the left side to cause the continuous cord material 100 to be folded, and causes the carriage operation direction 30 to move to the left side along with the operation direction of the yarn feeder 10. Further, the left-directed weaving pressing pieces De, Cd, Bc and Ab are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200. When about to sequentially press downwards, before sequentially passing the right-directed weaving pressing pieces eE, dD, cC and bB, the left-directed weaving pressing pieces De, Cd, Bc and Ab sequentially lift the right-directed weaving pressing pieces eE, dD, cC and bB that then disengage from the continuous cord material 100. When the yarn feeder 10 reaches the back knitting needle a, the yarn feeder 10 stops guiding to the left side, as shown by the weaving process 5-2. Similarly, the yarn feeder 10 may keep guiding the continuous cord material 100 back and forth to the left and right sides, such that the continuous cord material 100 is continually pressed downwards to become stacked in the woven sack interlayer 200, until the thickness currently required by the shape of the woven sack interlayer 200 is achieved, i.e., equivalently till the number predetermined by the operator is reached, as shown by the weaving process 5-n. Again referring to Fig. 5, after weaving is again performed along the carriage operation direction 30 to the left side, the first face yarn 21 and the second face yarn 22 are together sequentially stitched by the back knitting needle f, the front knitting needle E and the back knitting needle

e to form loops. The front knitting needles D, C and B and the back knitting needles d and c are then controlled to sequentially stitch the first face yarn 21 and the second face yarn 22 separately to form loops. Next, from the back knitting needle b, the front knitting needle A to the back knitting a, the first face yarn 21 and the second face yarn 22 are again together sequentially stitched to form loops, as shown by the weaving process 6 in Fig. 5. At this point, the woven sack interlayer 200 is narrowed and to be soon sealed. Referring to Fig. 10, at this point, the front knitting needles A to E and the back knitting needles a to f are controlled to stop weaving, and the yarn feeder 10 is caused to again guide and feed the continuous cord material 100 and to guide from the left side to the right side above the loops formed in the weaving process 6, such that the carriage operation direction 30 moves to the right side along with the operation direction of the yarn feeder 10. Further, the right-directed weaving pressing pieces bB, cC and dD are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200, to cause to the yarn feeder 10 to stop guiding to the right side as reaching the back knitting needle e, as shown by the weaving process 6-1. Next, the yarn feeder 10 switches to guide the continuous cord material 100 to the left side to cause the continuous cord material 100 to be folded, and causes the carriage operation direction 30 to again move to the left side along with the operation direction of the yarn feeder 10. Further, the left-directed weaving pressing pieces De, Cd and Bc are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200. When about to sequentially press downwards, before sequentially passing the right-directed weaving pressing pieces dD, cC and bB, the left-directed weaving pressing pieces De, Cd and Bc sequentially lift the right-directed weaving pressing pieces dD, cC and bB that then disengage from the continuous cord material 100. When the yarn feeder 10 reaches the back knitting needle b, the yarn feeder 10 stops guiding to the left side, as shown by the weaving process 6-2. Similarly, the yarn feeder 10 may keep guiding the continuous cord material 100 back and forth to the left and right sides, such that the continuous cord material 100 is continually pressed downwards to become stacked in the woven sack interlayer 200, until the thickness currently required by the shape of the woven sack interlayer 200 is achieved, i.e., equivalently till the number predetermined by the operator is reached, as shown by the weaving process 6-n. However, preferably, the thread diameter of the continuous cord material 100 is greater than four times of the thread diameter of the first face yarn 21 or the second face yarn 22. It should be noted that, in the weaving process 6-n, the yarn feeder 10 at the end guides the continuous cord material 100 to the right side (or the continuous cord material 100 may be guided to the left side), and guides the continuous cord material 100 towards the front needle bed or the back needle bed to depart the double-sided fabric. After departing the double-sided fabric, the continuous cord material 100 may also stay in the double-sided fabric, and be again guided and fed in when another woven sack interlayer 200 is to be formed. Again referring to Fig. 5, after the continuous cord material 100 departs the double-sided fabric, weaving is again performed along the carriage operation direction 30 to the right side, the front knitting needles A to E and the back knitting needles a to f sequentially stitch the first face yarn 21 and the second face yarn 22 together to form loops, and a seal of the woven sack interlayer 200 is then formed, as shown by the weaving process 7 in Fig. 5 and the planar section schematic diagram along the direction X-X in Fig. 4. Next, weaving is again performed along the carriage operation direction 30 to the left side, and the front knitting needles E to A and the back knitting needles f to a sequentially stitch the first face yarn 21 and the second face yarn 22 together to form loops, as shown by the weaving process 8 in Fig. 5 and the planar section schematic diagram along the direction X-X in Fig. 4.

[0019] Fig. 11 to Fig. 15 show a partial planar structural schematic diagram, a diagram of partial weaving processes, and diagrams of weaving processes of pressing in the continuous cord material according to a second preferred embodiment of the present invention. Referring to Fig. 12, when the flat bed knitting machine applied in the present invention starts weaving along a carriage operation direction 30 to the right side as shown by the weaving process 1, the front knitting needles A to E and the back knitting needles a to f sequentially stitch the face yarn 20 (including a first face yarn 21 and a second face yarn 22) to form loops. After weaving is next performed along the carriage operation direction 30 to the left side, the first face yarn 21 and the second face yarn 22 are together sequentially stitched by the back knitting needle f, the front knitting needle E and the back knitting needle e. The front knitting needles D, C and B and the back knitting needles d and c are then controlled to sequentially stitch the first face yarn 21 and the second face yarn 22 separately to form loops. Next, from the back knitting needle b, the front knitting needle A to the back knitting needle a, the first face yarn 21 and the second face yarn 22 are again together stitched to form loops, as shown by the weaving process 2 in Fig. 12. At this point, an initial weaving process of a woven sack interlayer 200 has begun. After weaving is again performed along the carriage operation direction 30 to the right side, the first face yarn 21 and the second face yarn 22 are together sequentially stitched by the back knitting needle a, the front knitting needle A and the back knitting needle e to form loops. The front knitting needles B, C and D and the back knitting needles c and d are then controlled to sequentially stitch the first face yarn 21 and the second face yarn 22 separately to form loops. Next, from the back knitting needle e, the front knitting needle E to the back knitting needle f, the first face yarn 21 and the second face yarn 22 are again together stitched to form loops, as shown by the weaving process 3 in Fig. 12. At this point, the woven sack interlayer 200 gradually expands. After weaving is

again performed along the carriage operation direction 30 to the left side, the first face yarn 21 and the second face yarn 22 are sequentially stitched together by the back knitting f, the front knitting needle E and the back knitting needle e. Next, the front knitting needles D, C and B and the back knitting needles d and c are controlled to sequentially stitch the first face yarn 21 and the second face yarn 22 separated to form loops. From the back knitting needle b, the front knitting needle A to the back knitting needle a, the first face yarn 21 and the second face yarn 22 are again together stitched to form loops, as shown by the weaving process 4 in Fig. 12. At this point, the woven sack interlayer 200 is substantially formed. Referring to Fig. 13, the front knitting needles A to E and the back knitting needles a to f are controlled to stop weaving, and the yarn feeder 10 is caused to guide and feed a continuous cord material 100 from between the front knitting needles A and B of the front needle bed and to guide from the left side to the right side above the loops formed in the weaving process 4, such that the carriage operation direction 30 moves to the right side along with the operation direction of the yarn feeder 10. Further, the right-directed weaving pressing pieces bB, cC and dD are controlled to sequentially press the continuous cord material 100 downwards into the substantially formed woven sack interlayer 200, to cause the yarn feeder 10 to stop guiding to the right side as reaching the back knitting needle e, as shown by the weaving process 4-1. Next, the yarn feeder 10 switches to guide the continuous cord material 100 to the left side to cause the continuous cord material 100 to be folded, and causes the carriage operation direction 30 to move to the left side along with the operation direction of the yarn feeder 10. Further, the left-directed weaving pressing pieces De, Cd and Bc are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200. When about to sequentially press downwards, before sequentially passing the right-directed weaving pressing pieces dD, cC and bB, the left-directed weaving pressing pieces De, Cd and Bc sequentially lift the right-directed weaving pressing pieces dD, cC and bB that then disengage from the continuous cord material 100. When the yarn feeder 10 reaches the back knitting needle b, the yarn feeder 10 stops guiding to the left side, as shown by the weaving process 4-2. Similarly, the yarn feeder 10 may keep guiding the continuous cord material 100 back and forth to the left and right sides, such that the continuous cord material 100 is continually pressed downwards to become stacked in the woven sack interlayer 200, until the thickness currently required by the shape of the woven sack interlayer 200 is achieved, i.e., equivalently till the number predetermined by the operator is reached, as shown by the weaving process 4-n (where n is a predetermined number greater than 2). It should be noted that, at this point, the shape of the woven sack interlayer 200 is substantially formed and so the woven sack interlayer 200 has a larger space for accommodating the continuous cord material 100. Thus, the predetermined value n may be in a larger value, which is also determined according to the thickness of the continuous cord material 100, till the required thickness is achieved. Again referring to Fig. 12, after weaving is again performed along the carriage operation direction 30 to the right side, the first face yarn 21 and the second face yarn 22 are together sequentially stitched by the back knitting needle a, the front knitting needle A and the back knitting needle e to form loops. The front knitting needles B, C and D and the back knitting needles c and d are then controlled to sequentially stitch the first face yarn 21 and the second face yarn 22 separately to form loops. Next, from the back knitting needle e, the front knitting needle E to the back knitting needle f, the first face yarn 21 and the second face yarn 22 are again together stitched to form loops, as shown by the weaving process 5. At this point, the woven sack interlayer 200 formed continues to expand. Referring to Fig. 14, similarly, the front knitting needles A to E and the back knitting needles a to f are controlled to stop weaving, and the yarn feeder 10 is caused to again guide and feed the continuous cord material 100 and to guide from the left side to the right side above the loops formed in the weaving process 5, such that the carriage operation direction 30 moves to the right side along with the operation direction of the yarn feeder 10. Further, the right-directed weaving pressing pieces bB, cC and dD are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200, to cause to the yarn feeder 10 to stop guiding to the right side as reaching the back knitting needle e, as shown by the weaving process 5-1. Next, the yarn feeder 10 switches to guide the continuous cord material 100 to the left side to cause the continuous cord material 100 to be folded, and causes the carriage operation direction 30 to move to the left side along with the operation direction of the yarn feeder 10. Further, the left-directed weaving pressing pieces De, Cd and Bc are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200. When about to sequentially press downwards, before sequentially passing the right-directed weaving pressing pieces dD, cC and bB, the left-directed weaving pressing pieces De, Cd and Bc sequentially lift the right-directed weaving pressing pieces dD, cC and bB that then disengage from the continuous cord material 100. When the yarn feeder 10 reaches the back knitting needle b, the yarn feeder 10 stops guiding to the left side, as shown by the weaving process 5-2. Similarly, the yarn feeder 10 may keep guiding the continuous cord material 100 back and forth to the left and right sides, such that the continuous cord material 100 is continually pressed downwards to become stacked in the woven sack interlayer 200, until the thickness currently required by the shape of the woven sack interlayer 200 is achieved, i.e., equivalently till the number predetermined by the operator is reached, as shown by the weaving process 5-n. Again referring to Fig. 12, after weaving is again performed along the carriage operation

direction 30 to the left side, the first face yarn 21 and the second face yarn 22 are together sequentially stitched by the back knitting needle f, the front knitting needle E and the back knitting needle e to form loops. The front knitting needles D, C and B and the back knitting needles d and c are then controlled to sequentially stitch the first face yarn 21 and the second face yarn 22 separately to form loops. Next, from the back knitting needle b, the front knitting needle A to the back knitting a, the first face yarn 21 and the second face yarn 22 are again together sequentially stitched to form loops, as shown by the weaving process 6. At this point, the woven sack interlayer 200 is about to be sealed. Referring to Fig. 15, at this point, the front knitting needles A to E and the back knitting needles a to f are controlled to stop weaving, and the yarn feeder 10 is caused to again guide and feed the continuous cord material 100 and to guide from the left side to the right side above the loops formed in the weaving process 6, such that the carriage operation direction 30 moves to the right side along with the operation direction of the yarn feeder 10. Further, the right-directed weaving pressing pieces bB, cC and dD are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200, to cause to the yarn feeder 10 to stop guiding to the right side as reaching the back knitting needle e, as shown by the weaving process 6-1. Next, the yarn feeder 10 switches to guide the continuous cord material 100 to the left side to cause the continuous cord material 100 to be folded, and causes the carriage operation direction 30 to again move to the left side along with the operation direction of the yarn feeder 10. Further, the left-directed weaving pressing pieces De, Cd and Bc are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200. When about to sequentially press downwards, before sequentially passing the right-directed weaving pressing pieces dD, cC and bB, the left-directed weaving pressing pieces De, Cd and Bc sequentially lift the right-directed weaving pressing pieces dD, cC and bB that then disengage from the continuous cord material 100. When the yarn feeder 10 reaches the back knitting needle b, the yarn feeder 10 stops guiding to the left side, as shown by the weaving process 6-2. Similarly, the yarn feeder 10 may keep guiding the continuous cord material 100 back and forth to the left and right sides, such that the continuous cord material 100 is continually pressed downwards to become stacked in the woven sack interlayer 200, until the thickness currently required by the shape of the woven sack interlayer 200 is achieved, i.e., equivalently till the number predetermined by the operator is reached, as shown by the weaving process 6-n. In the weaving process 6-n, the yarn feeder 10 at the end guides the continuous cord material 100 to the right side (or the continuous cord material 100 may be guided to the left side), and the continuous cord material 100 is guided towards the front needle bed or the back needle bed to depart the double-sided fabric. After departing the double-sided fabric, the continuous cord material 100 may also stay in the double-sided fabric, and be again guided and fed in when another woven sack interlayer 200 is to be formed. Again referring to Fig. 12, after the continuous cord material 100 departs the double-sided fabric, weaving is again performed along the carriage operation direction 30 to the right side, the front knitting needles A to E and the back knitting needles a to f sequentially stitch the first face yarn 21 and the second face yarn 22 together to form loops, and a seal of the woven sack interlayer 200 is formed, as shown by the weaving process 7 in Fig. 11 and Fig. 12. Next, weaving is again performed along the carriage operation direction 30 to the left side, and the front knitting needles E to A and the back knitting needles f to a sequentially stitch the first face yarn 21 and the second face yarn 22 together to form loops, as shown by the weaving process 8 in Fig. 11 and Fig. 12. It should be noted that, in the second preferred embodiment of the present invention, the weaving processes 4-1, 4-2 to 4-n and the weaving processes 5-1, 5-2 to 5-n may be omitted, and the continuous cord material 100 may be guided by the yarn feeder 10 from the left side to the right side above the loops stitched by the weaving process 6 to directly perform the weaving processes 6-1, 6-2 to 6-n. Thus, the continuous cord material 100 is caused to continually pressed downwards to become stacked in the woven sack interlayer 200 until the thickness required by the shape of the woven sack interlayer 200 is achieved.

[0020] Fig. 16 to Fig. 21 show a partial planar structural schematic diagram, a planar section diagram along a direction Y-Y, a diagram of partial weaving processes, and diagrams of weaving processes of pressing a continuous cord material according to a third preferred embodiment of the present invention. It is clearly seen from Fig. 18 as well as Fig. 16 and Fig. 17 that, when the flat bed knitting machine applied in the present invention starts weaving along a carriage operation direction 30 to the right side as shown by the weaving process 1 in Fig. 18, the front knitting needles A to E and the back knitting needles a to f sequentially stitch a face yarn 20 to form loops. After weaving is next performed along the carriage operation direction 30 to the left side, the face yarn 20 is sequentially stitched by the back knitting needle f, the front knitting needle E and the back knitting needle e to form loops. Only the front knitting needles D, C and B, but not the back knitting needles d and c, are then controlled stitch the face yarn 20 to form loops. Next, the face yarn 20 is sequentially stitched by the back knitting needle b, the front knitting needle A and the back knitting needle a to form loops, as shown by the weaving process 2 in Fig. 18. At this point, an initial weaving process of a woven sack interlayer 200 has begun. After weaving is again performed along the carriage operation direction 30 to the right side, the face yarn 20 is sequentially stitched by the back knitting needle a, the front knitting needle A and the back knitting needle e to form loops. Only the back knitting needles c and d, but not the front knitting needle

B, C and D, are then controlled to sequentially stitch the face yarn 20 to form loops. Next, from the back knitting needle e, the front knitting needle E to the back knitting needle E, the face yarn 20 is sequentially stitched to form loops, as shown by the weaving process 3 in Fig. 18. At this point, the woven sack interlayer 200 gradually expands. After weaving is again performed along the carriage operation direction 30 to the left side, the face yarn 20 is sequentially stitched by the back knitting needle f, the front knitting needle E and the back knitting needle e to form loops. Only the front knitting needles D, C and B, but not the back knitting needles d and c, are then controlled to sequentially stitch the face yarn 20 to form loops. Next, the face yarn 20 is sequentially stitched by the back knitting needle b, the front knitting needle A and the back knitting needle a to form loops, as shown by the weaving process 4 in Fig. 18. At this point, the woven sack interlayer 200 is substantially formed. Referring to Fig. 19, at this point, the front knitting needles A to E and the back knitting needles a to f are controlled to stop weaving, and the yarn feeder 10 is caused to guide and feed the continuous cord material 100 from between the front knitting needles A and B of the front needle bed and to guide from the left side to the right side above the loops formed in the weaving process 4, such that the carriage operation direction 30 moves to the right side along with the operation direction of the yarn feeder 10. Further, the right-directed weaving pressing pieces bB, cC and dD are controlled to sequentially press the continuous cord material 100 downwards into the initially formed woven sack interlayer 200, to cause the yarn feeder 10 to stop guiding to the right side as reaching the back knitting needle e, as shown by the weaving process 4-1. It should be noted that, the thread diameter of the continuous cord material 100 is preferably greater than four times of the thread diameter of the face yarn 20. Next, the yarn feeder 10 switches to guide the continuous cord material 100 to the left side to cause the continuous cord material 100 to be folded, and causes the carriage operation direction 30 to move to the left side along with the operation direction of the yarn feeder 10. Further, the left-directed weaving pressing pieces De, Cd and Bc are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200. When about to sequentially press downwards, before sequentially passing the right-directed weaving pressing pieces dD, cC and bB, the left-directed weaving pressing pieces De, Cd and Bc sequentially lift the right-directed weaving pressing pieces dD, cC and bB that then disengage from the continuous cord material 100. When the yarn feeder 10 reaches the back knitting needle b, the yarn feeder 10 stops guiding to the left side, as shown by the weaving process 4-2. Similarly, the yarn feeder 10 may keep guiding the continuous cord material 100 back and forth to the left and right sides, such that the continuous cord material 100 is continually pressed downwards to become stacked in the woven sack interlayer 200, until the thickness currently required by the shape of the woven sack interlayer 200 is achieved, i.e., equivalently till the number predetermined by the operator is reached (where n is a predetermined value greater than 2), as shown by the weaving process 5-n. It should be noted that, at this point, the woven sack interlayer 200 is substantially formed, and so the woven sack interlayer 200 has a larger space for accommodating the continuous cord material 100. Thus, the predetermined value n may be in a larger value, which is also determined according to the thickness of the continuous cord material 100, till the required thickness is achieved. Again referring to Fig. 18, after weaving is again performed along the carriage operation direction 30 to the right side, the face yarn 20 is sequentially stitched by the back knitting needle a, the front knitting needle A and the back knitting needle e to form loops. Next, only the back knitting needles c and d, but not the front knitting needles B, C and D, are controlled to sequentially stitch the face yarn 20 to form loops. The back knitting needle e, the front knitting needle E to the back knitting needle f then stitch the face yarn 20 to form loops, as shown by the weaving process 5. At this point, the formed woven sack interlayer 200 continues to expand. Referring to Fig. 20, similarly, the front knitting needles A to E and the back knitting needles a to f are controlled to stop weaving, and the yarn feeder 10 is caused to again guide and feed the continuous cord material 100 and to guide from the left side to the right side above the loops formed in the weaving process 5, such that the carriage operation direction 30 moves to the right side along with the operation direction of the yarn feeder 10. Further, the right-directed weaving pressing pieces bB, cC and dD are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200, to cause to the yarn feeder 10 to stop guiding to the right side as reaching the back knitting needle e, as shown by the weaving process 5-1. Next, the yarn feeder 10 switches to guide the continuous cord material 100 to the left side to cause the continuous cord material 100 to be folded, and causes the carriage operation direction 30 to move to the left side along with the operation direction of the yarn feeder 10. Further, the left-directed weaving pressing pieces De, Cd and Bc are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200. When about to sequentially press downwards, before sequentially passing the right-directed weaving pressing pieces dD, cC and bB, the left-directed weaving pressing pieces De, Cd and Bc sequentially lift the right-directed weaving pressing pieces dD, cC and bB that then disengage from the continuous cord material 100. When the yarn feeder 10 reaches the back knitting needle b, the yarn feeder 10 stops guiding to the left side, as shown by the weaving process 5-2. Similarly, the yarn feeder 10 may keep guiding the continuous cord material 100 back and forth to the left and right sides, such that the continuous cord material 100 is continually pressed downwards to become stacked in the woven sack interlayer 200, until the thickness currently required by the

shape of the woven sack interlayer 200 is achieved, i.e., equivalently till the number predetermined by the operator is reached, as shown by the weaving process 5-n. Again referring to Fig. 18, after weaving is again performed along the carriage operation direction 30 to the left side, the face yarn 20 is sequentially stitched by the back knitting needle f, the front knitting needle E and the back knitting needle e to form loops. Next, only the front knitting needles D, C and B, but not the back knitting needles d and c, are controlled to sequentially stitch the face yarn 20 to form loops. From the back knitting needle b, the front knitting needle A to the back knitting needle a, the face yarn 20 is again stitched to form loops, as shown by the weaving process 6. At this point, the woven sack interlayer 200 is about to be sealed. Referring to Fig. 21, at this point, the front knitting needles A to E and the back knitting needles a to f are controlled to stop weaving, and the yarn feeder 10 is caused to again guide and feed the continuous cord material 100 and to guide from the left side to the right side above the loops formed in the weaving process 6, such that the carriage operation direction 30 moves to the right side along with the operation direction of the yarn feeder 10. Further, the right-directed weaving pressing pieces bB, cC and dD are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200, to cause to the yarn feeder 10 to stop guiding to the right side as reaching the back knitting needle e, as shown by the weaving process 6-1. Next, the yarn feeder 10 switches to guide the continuous cord material 100 to the left side to cause the continuous cord material 100 to be folded, and causes the carriage operation direction 30 to again move to the left side along with the operation direction of the yarn feeder 10. Further, the left-directed weaving pressing pieces De, Cd and Bc are controlled to sequentially press the continuous cord material 100 downwards into the woven sack interlayer 200. When about to sequentially press downwards, before sequentially passing the right-directed weaving pressing pieces dD, cC and bB, the left-directed weaving pressing pieces De, Cd and Bc sequentially lift the right-directed weaving pressing pieces dD, cC and bB that then disengage from the continuous cord material 100. When the yarn feeder 10 reaches the back knitting needle b, the yarn feeder 10 stops guiding to the left side, as shown by the weaving process 6-2. Similarly, the yarn feeder 10 may keep guiding the continuous cord material 100 back and forth to the left and right sides, such that the continuous cord material 100 is continually pressed downwards to become stacked in the woven sack interlayer 200, until the thickness currently required by the shape of the woven sack interlayer 200 is achieved, i.e., equivalently till the number predetermined by the operator is reached, as shown by the weaving process 6-n. In the weaving process 6-n, the yarn feeder 10 at the end guides the continuous cord material 100 to the right side (or the continuous cord material 100 may be guided to the left side), and the continuous cord material 100 is guided towards the front needle bed or the back needle bed to depart the double-sided fabric. After departing the double-sided fabric, the continuous cord material 100 may also stay in the double-sided fabric, and be again guided and fed in when another woven sack interlayer 200 is to be formed. Again referring to Fig. 18, after the continuous cord material 100 departs the double-sided fabric, weaving is again performed along the carriage operation direction 30 to the right side, the front knitting needles A to E and the back knitting needles a to f sequentially stitch the face yarn 20 to form loops, and a seal of the woven sack interlayer 200 is formed, as shown by the weaving process 7 in Fig. 16 and Fig. 18. Next, weaving is again performed along the carriage operation direction 30 to the left side, and the front knitting needles E to A and the back knitting needles f to a sequentially stitch the first face yarn 21 and the second face yarn 22 together to form loops, as shown by the weaving process 8 in Fig. 11 and Fig. 12. It should be noted that, in the third preferred embodiment of the present invention, the weaving processes 4-1, 4-2 to 4-n, and the weaving processes 5-1, 5-2 to 5-n may be omitted, and the continuous cord material 100 may be guided by the yarn feeder 10 from the left side to the right side above the loops stitched by the weaving process 6 shown to directly perform the weaving processes 6-1, 6-2 to 6-n, as shown in Fig. 21. Thus, the continuous cord material 100 is caused to continually pressed downwards to become stacked in the woven sack interlayer 200 until the thickness required by the shape of the woven sack interlayer 200 is achieved.

[0021] As will become apparent to a person skilled in the art, the present invention relates as well to a method for producing a double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer as outlined above, using a flat bed knitting machine comprising a front needle bed, a back needle bed and a loop presser bed, wherein the front needle bed comprises a plurality of front knitting needles (A to E), the back needle bed comprises a plurality of back knitting needles (a to f) at corresponding positions staggered from the plurality of front knitting needles (A to E), the loop presser bed is disposed above the front needle bed or the back needle bed, the loop presser bed comprises a plurality of right-directed weaving pressing pieces (aA, bB, cC, dD and eE) and a plurality of left-directed weaving pressing pieces (Ef, De, Cd, Bc and Ab) correspondingly alternately arranged in gaps of the plurality of front knitting needles (A to E) and the plurality of back knitting needles (a to f), respectively, wherein at least one woven sack interlayer (200) of the double-sided fabric stacked with a continuous cord material is formed from loops stitched from the face yarn (20) by the plurality of front knitting needles and the plurality of back knitting needles, and at least one continuous cord material (100) of the woven sack interlayer (200) is pressed into the woven sack interlayer (200) by the right-directed weaving pressing pieces and the left-directed weaving pressing pieces to become folded and stacked to form a thickness.

[0022] Further embodiments of this method are set forth above and subject-matter of the corresponding product claims 2 to 6 claimed in the appended claims.

Claims

1. A double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer, the double-sided fabric being woven from a face yarn (20) by a flat bed knitting machine comprising a front needle bed, a back needle bed and a loop presser bed, the front needle bed comprising a plurality of front knitting needles (A to E), the back needle bed comprising a plurality of back knitting needles (a to f) at corresponding positions staggered from the plurality of front knitting needles (A to E), the loop presser bed disposed above the front needle bed or the back needle bed, the loop presser bed comprising a plurality of right-directed weaving pressing pieces (aA, bB, cC, dD and eE) and a plurality of left-directed weaving pressing pieces (Ef, De, Cd, Bc and Ab) correspondingly alternately arranged in gaps of the plurality of front knitting needles (A to E) and the plurality of back knitting needles (a to f), respectively, the double-sided fabric, stacked with a continuous cord material and forming a thickness in a woven sack interlayer being characterized that:

   the double-sided fabric further comprises at least one woven sack interlayer (200) formed from loops stitched from the face yarn (20) by the plurality of front knitting needles and the plurality of back knitting needles, and the woven sack interlayer (200) comprises therein at least one continuous cord material (100), which is pressed into the woven sack interlayer (200) by the right-directed weaving pressing pieces and the left-directed weaving pressing pieces to become folded and stacked to form a thickness.

2. The double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer of claim 1, wherein the continuous cord material (100) is guided an fed in from the front needle bed towards the double-sided fabric, and guided towards the front needle bed to depart from the double-sided fabric.

3. The double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer of claim 1, wherein the continuous cord material (100) is guided an fed in from the front needle bed towards the double-sided fabric, and guided towards the back needle bed to depart from the double-sided fabric.

4. The double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer of claim 1, wherein the continuous cord material (100) is guided an fed in from the back needle bed towards the double-sided fabric, and guided towards the back needle bed to depart from the double-sided fabric.

5. The double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer of claim 1, wherein the continuous cord material (100) is guided an fed in from the back needle bed towards the double-sided fabric, and guided towards the front needle bed to depart from the double-sided fabric.

6. The double-sided fabric stacked with a continuous cord material and forming a thickness in a woven sack interlayer of any of the preceding claims, wherein a thread diameter of the continuous cord material (100) is greater than a thread diameter of the face yarn (20).

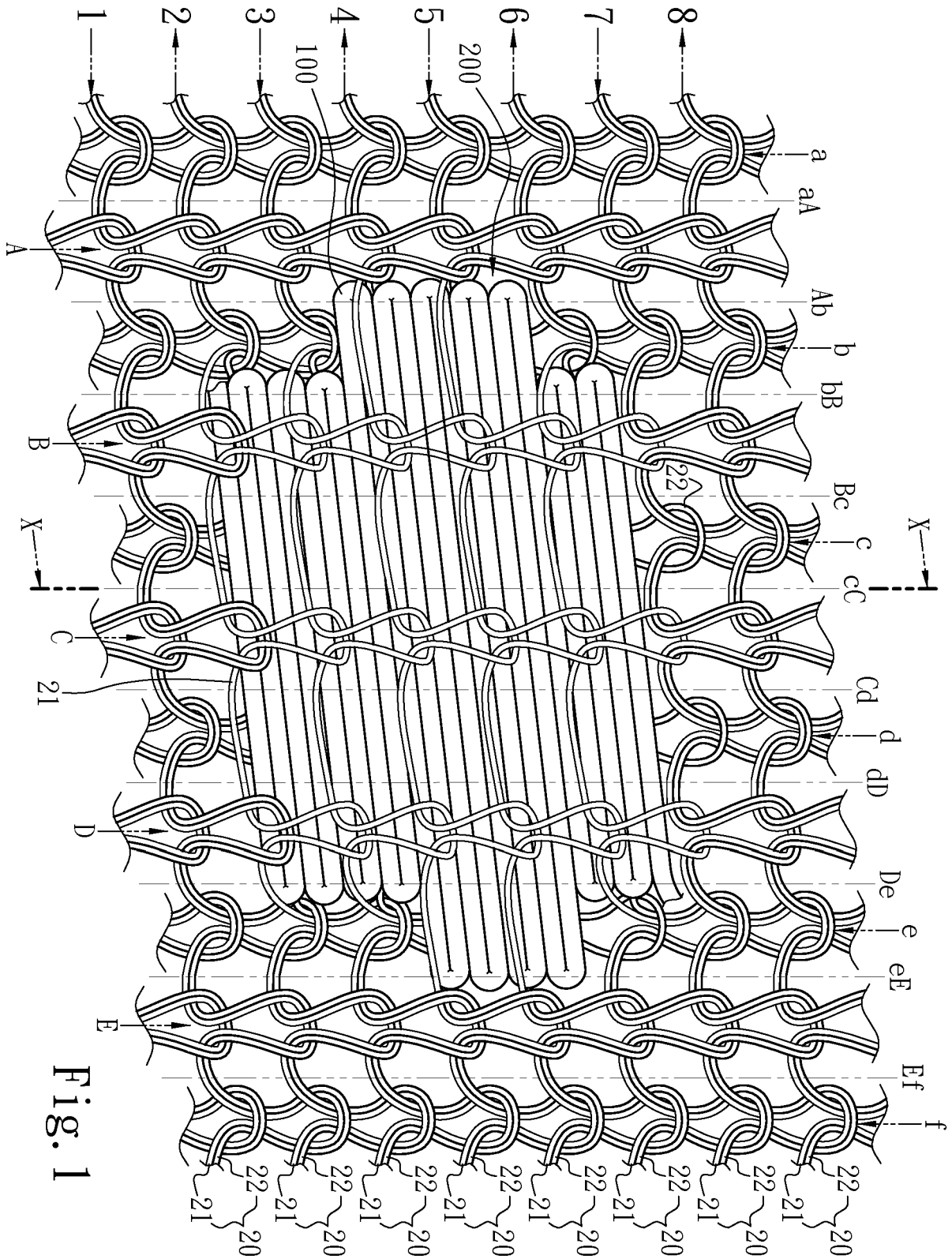
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Fig. 1

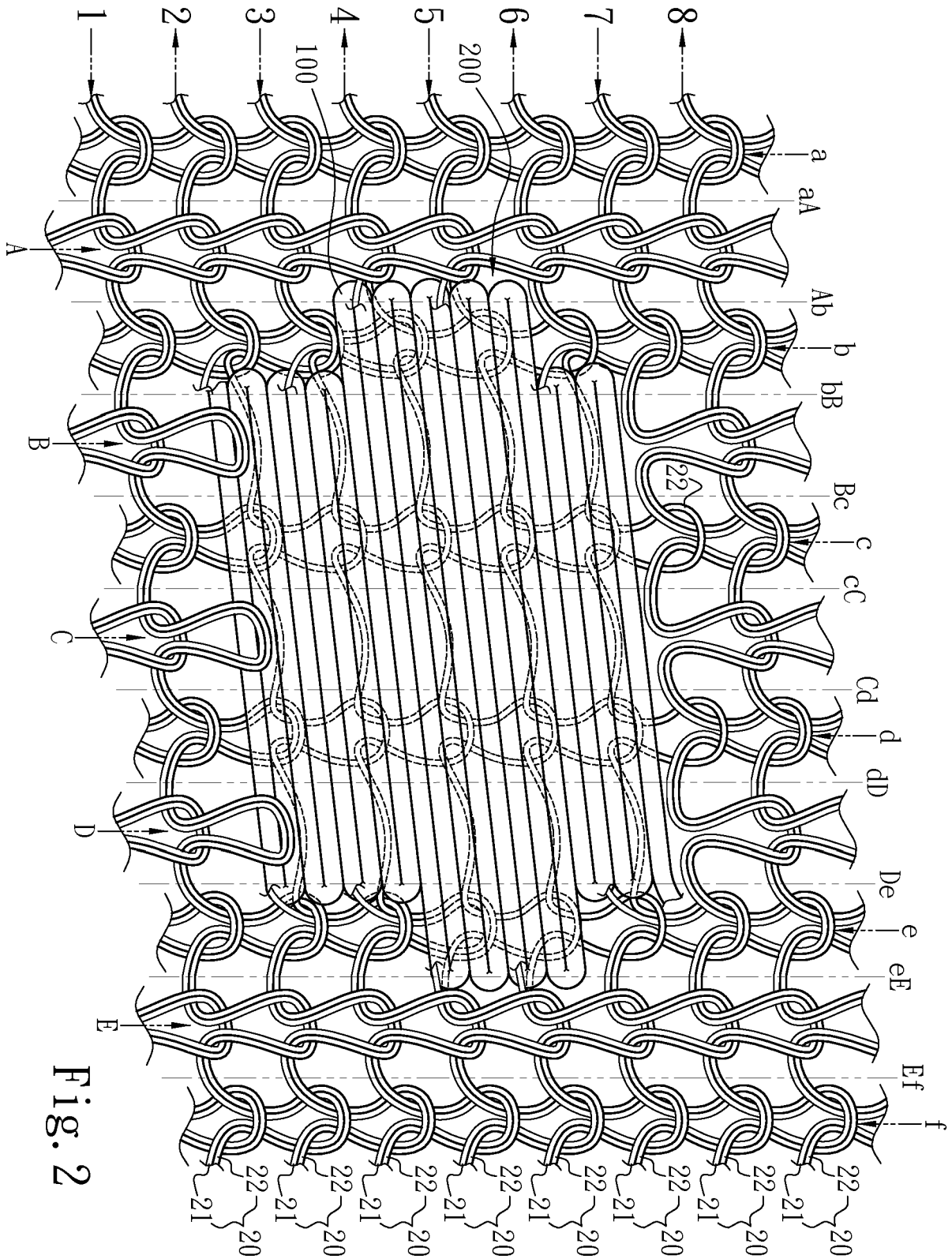
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Fig. 2

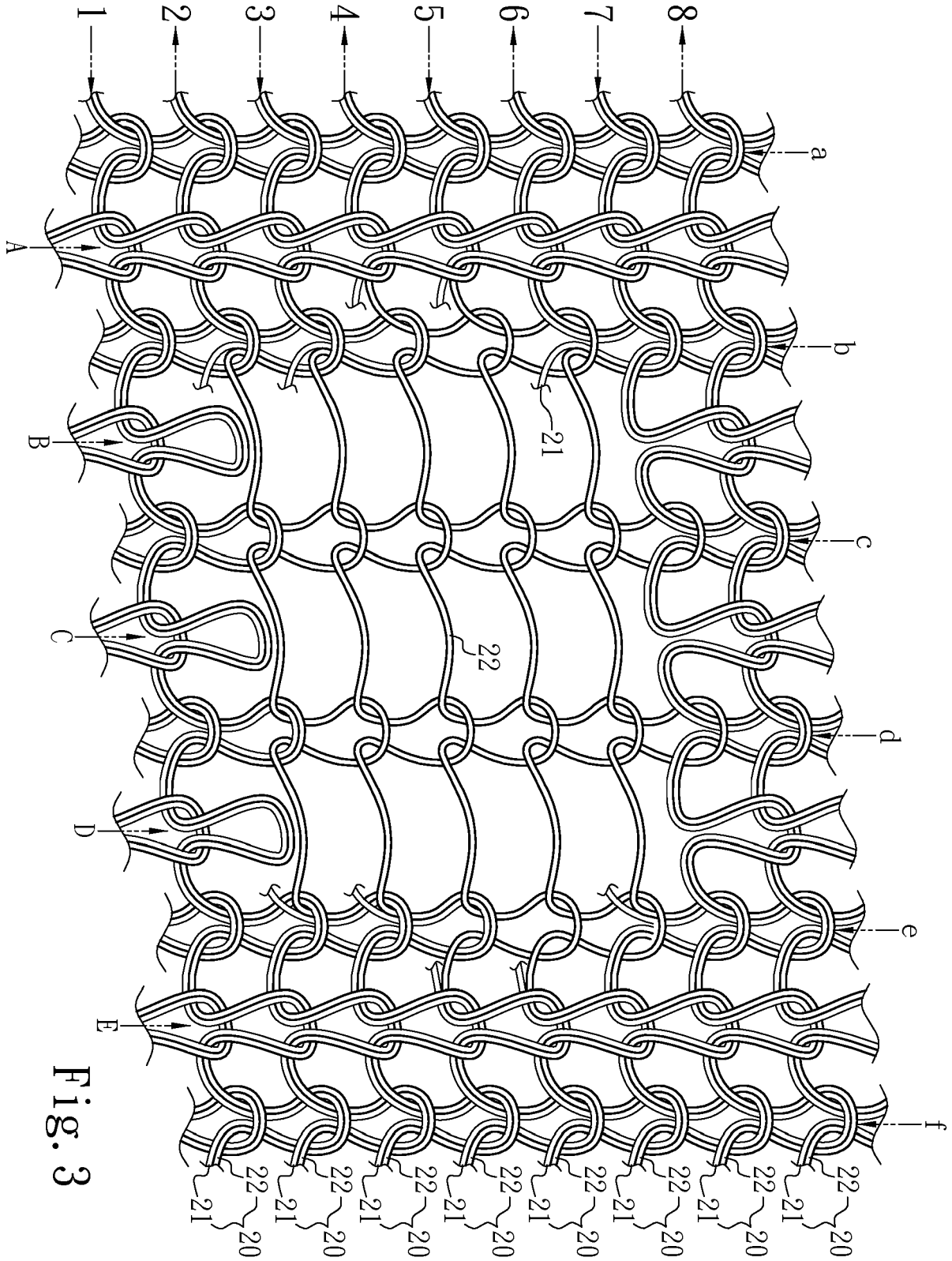


Fig. 3

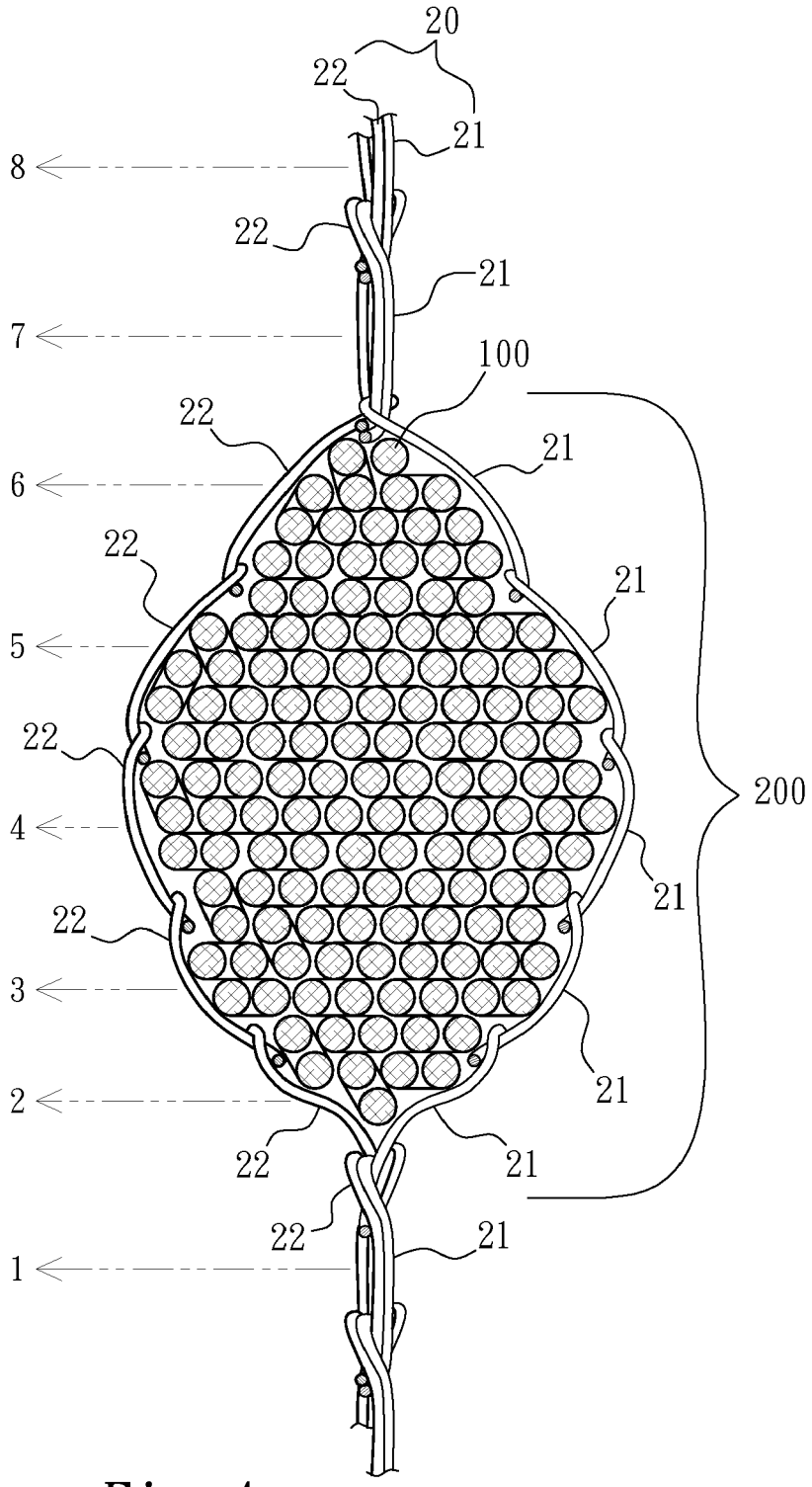
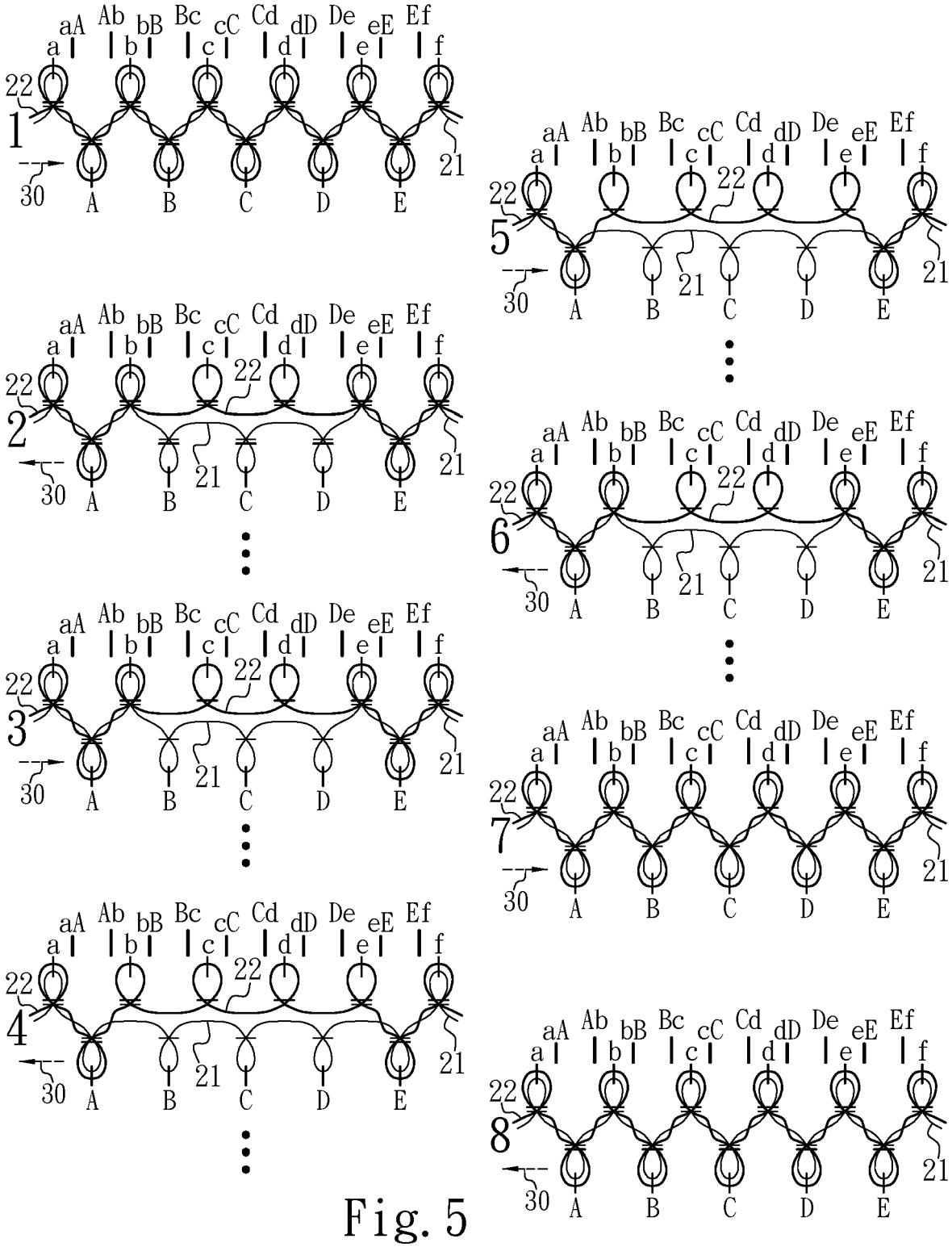


Fig. 4 X-X



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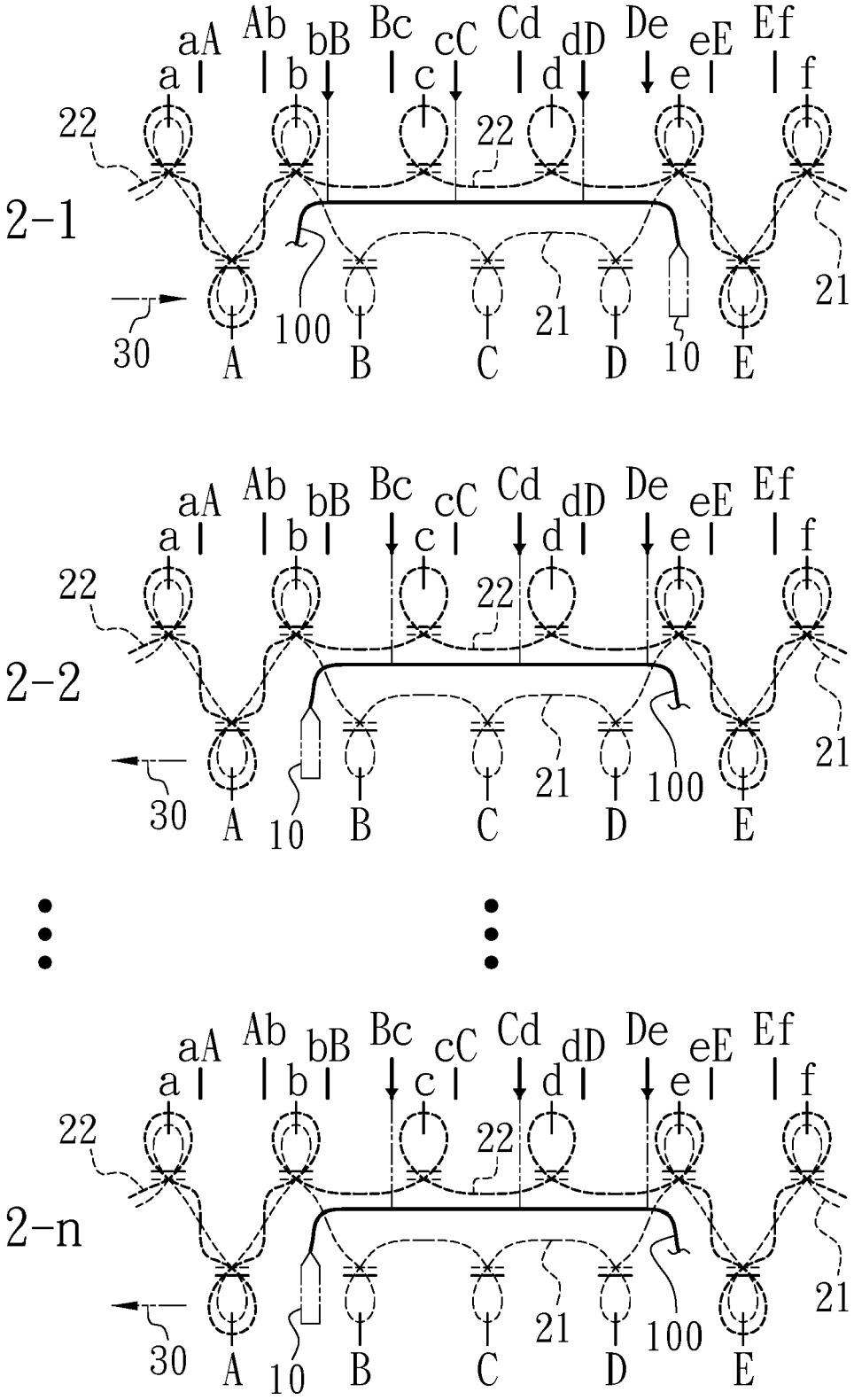
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Fig. 6

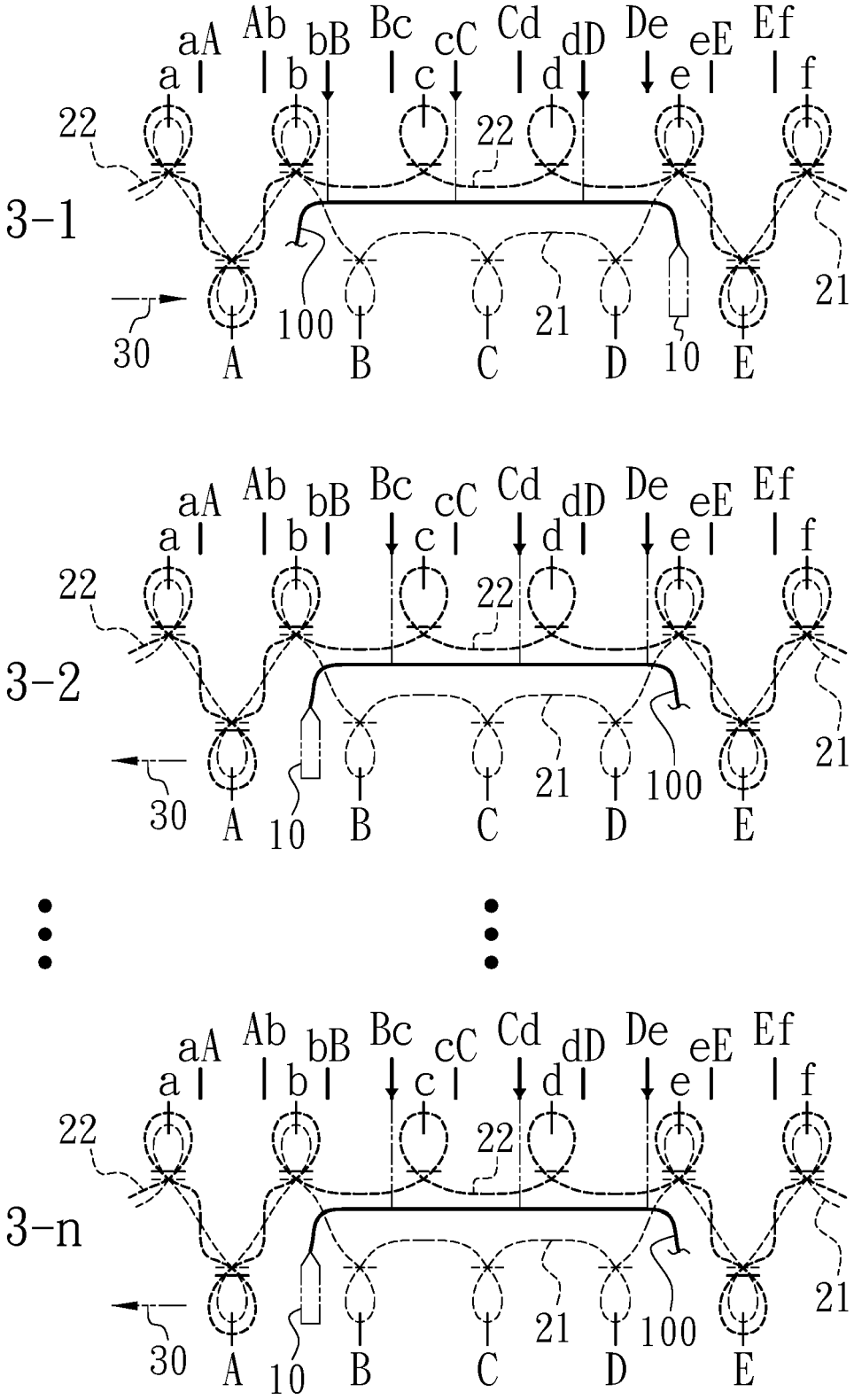
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Fig. 7

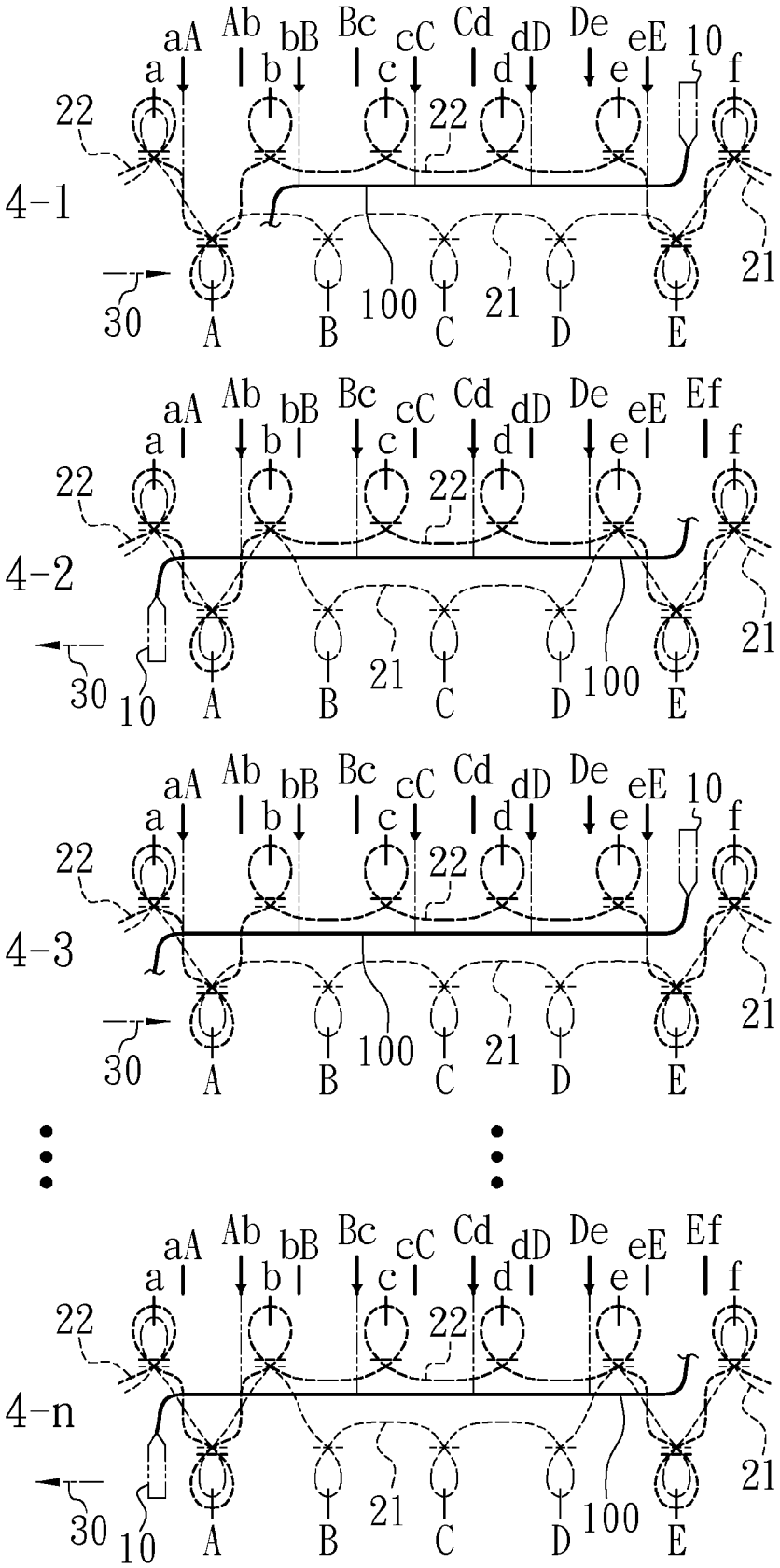
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Fig. 8

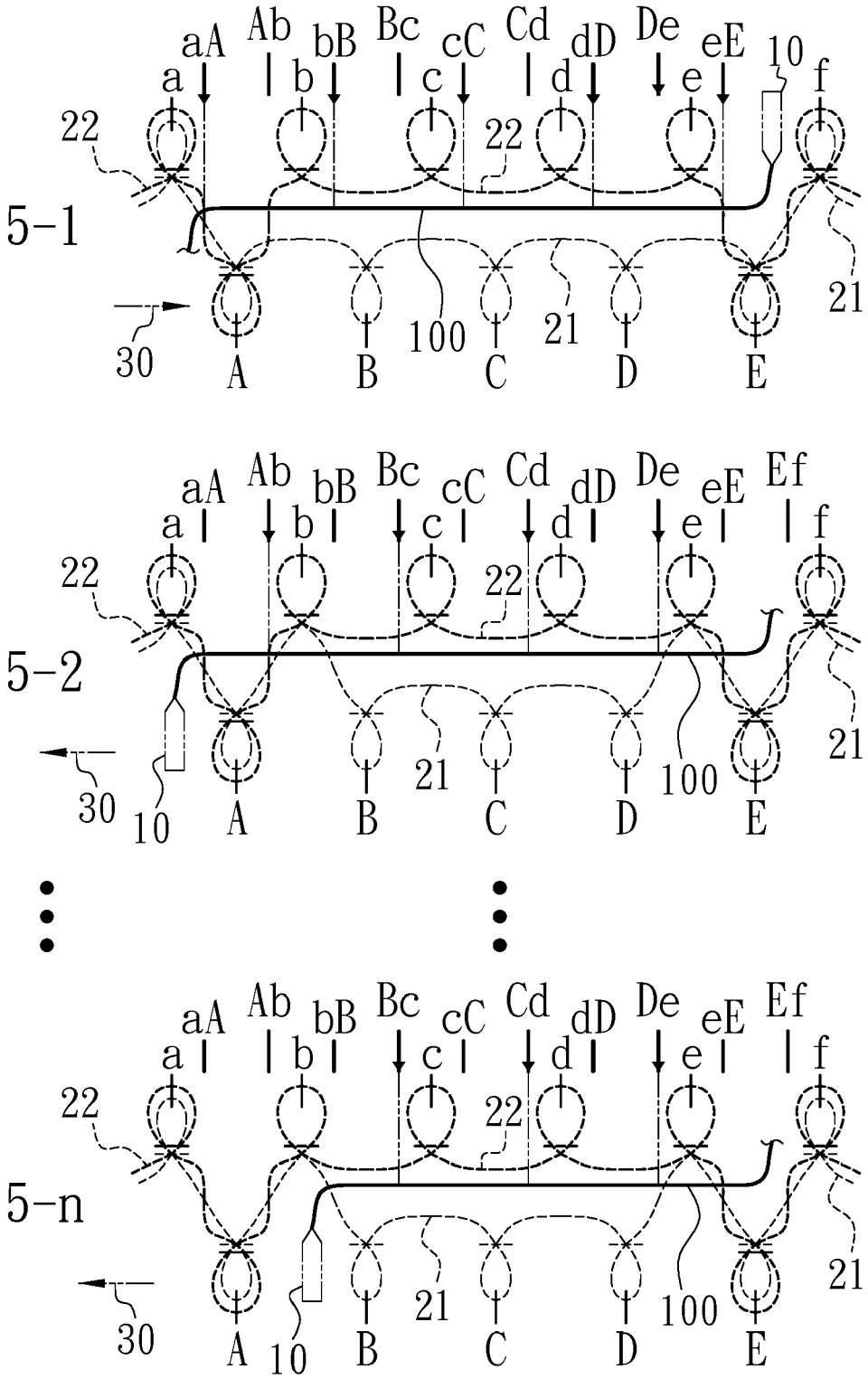

Fig. 9

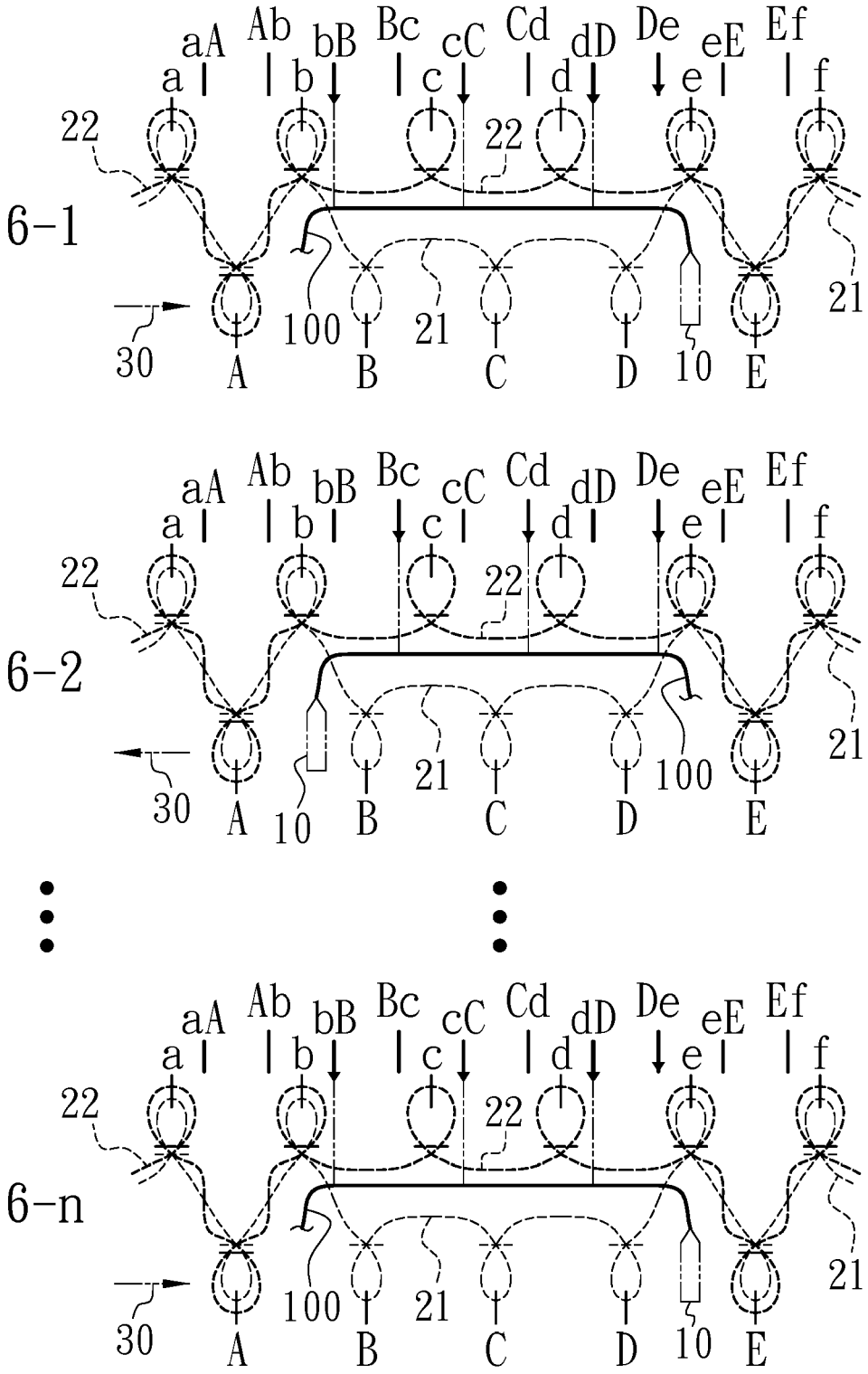
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Fig. 10

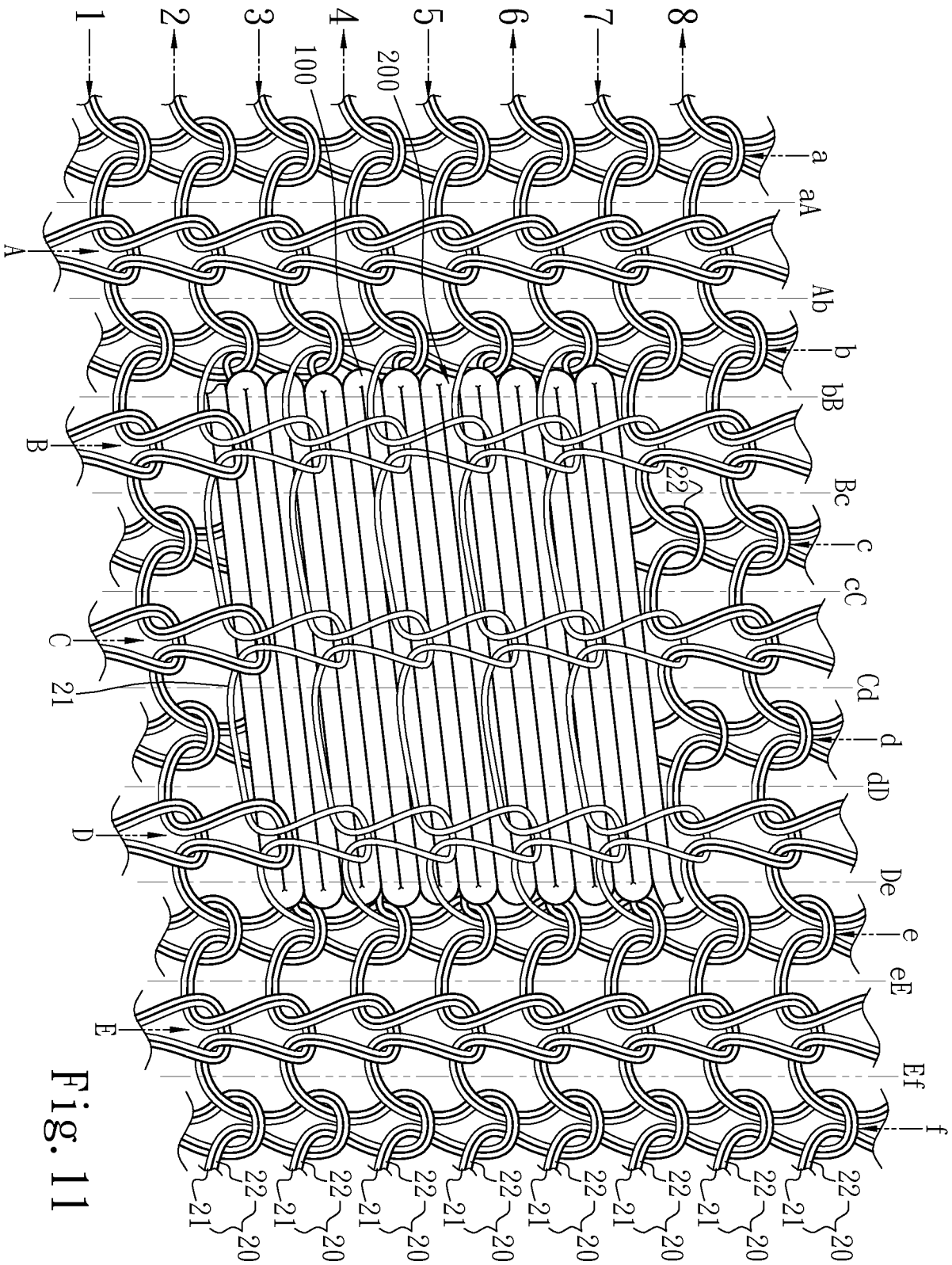
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Fig. 11

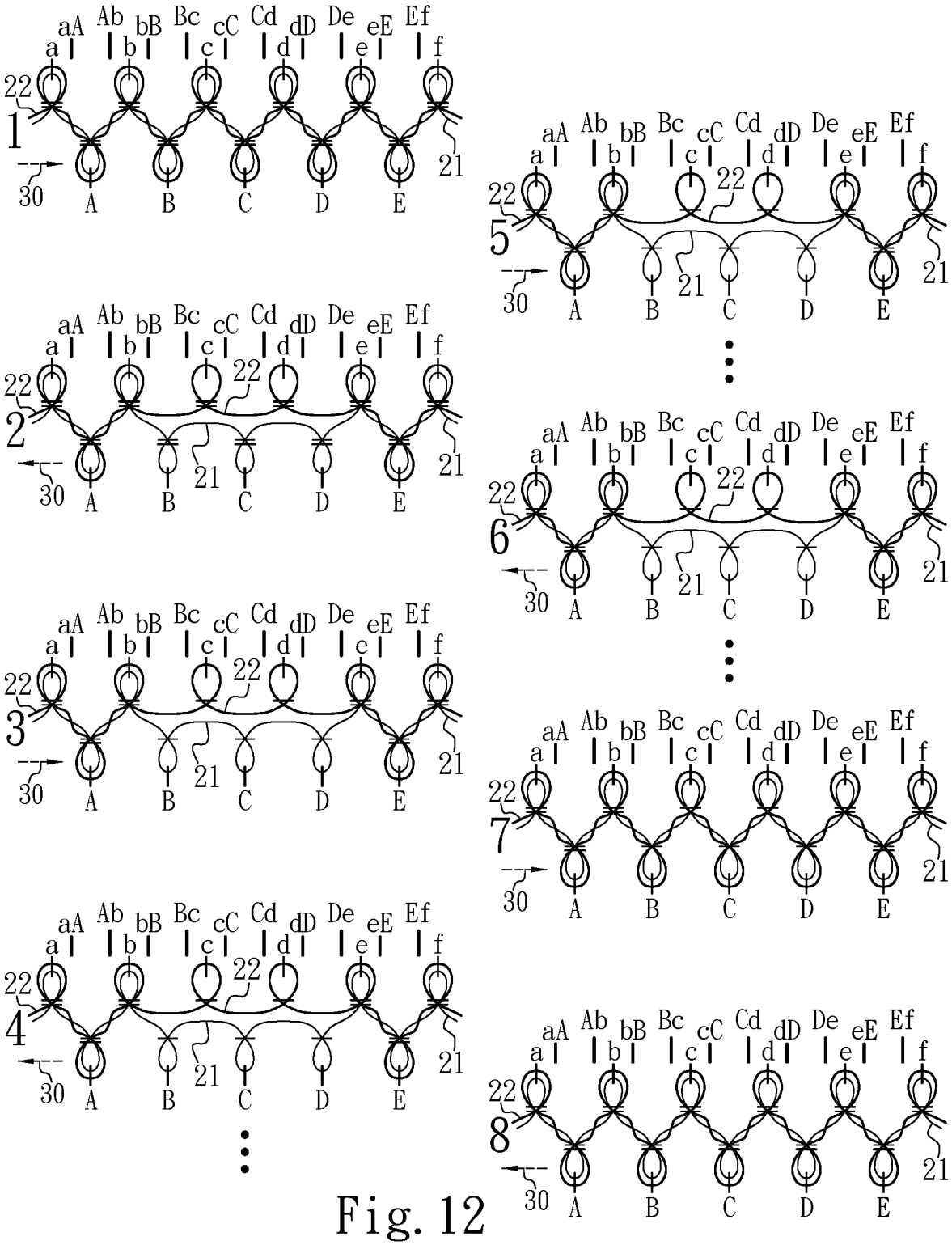

Fig. 12

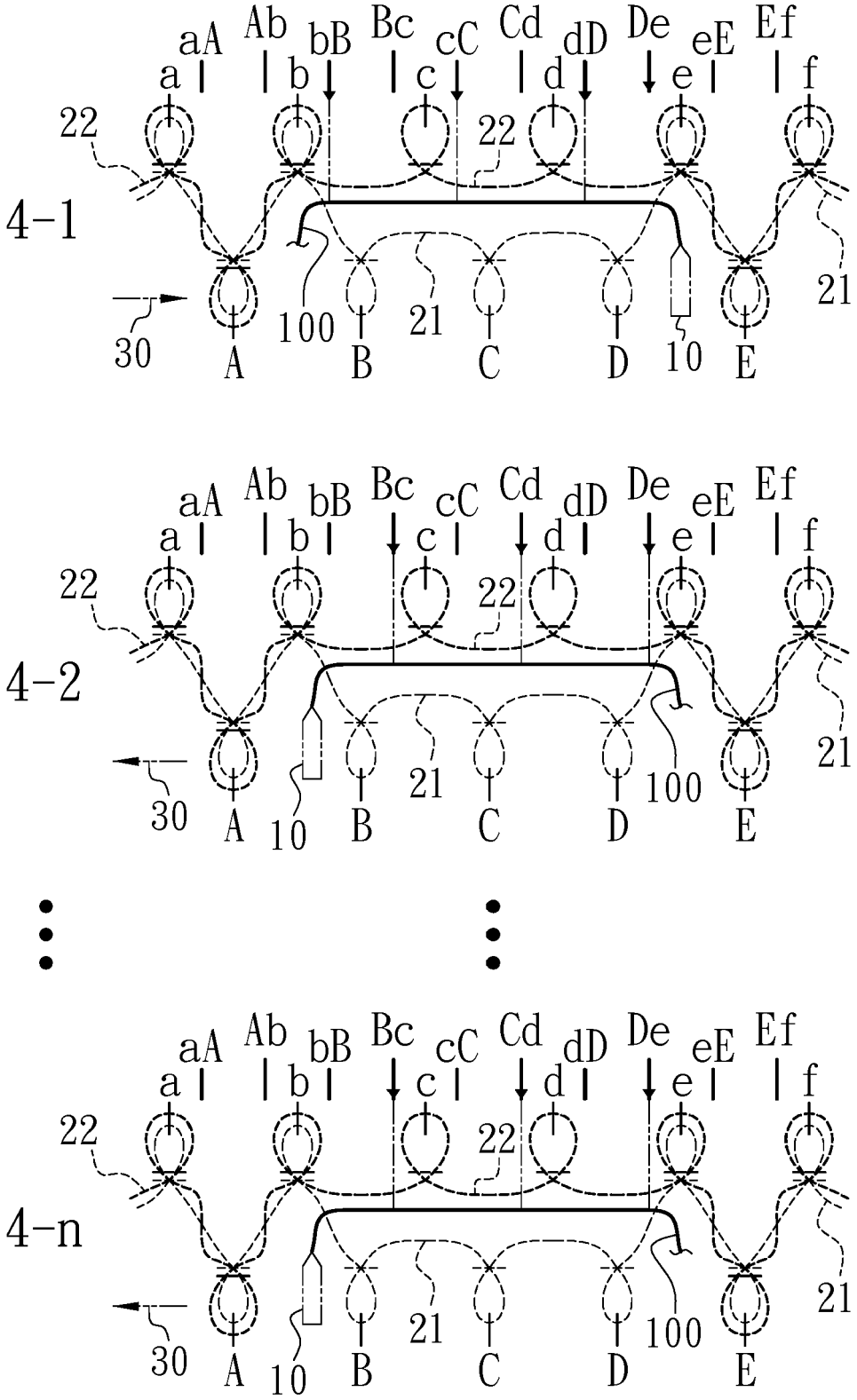
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Fig. 13

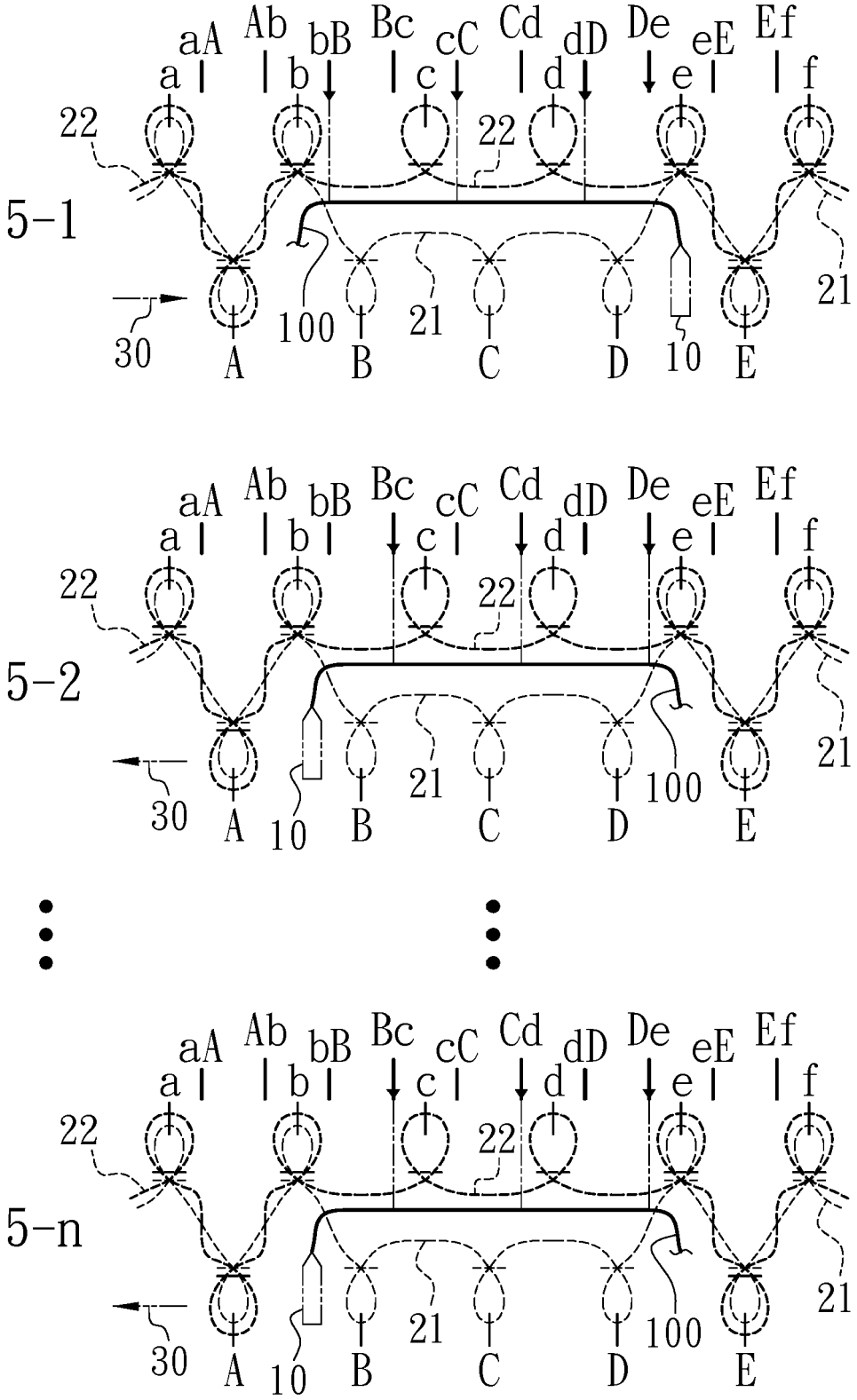
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Fig. 14

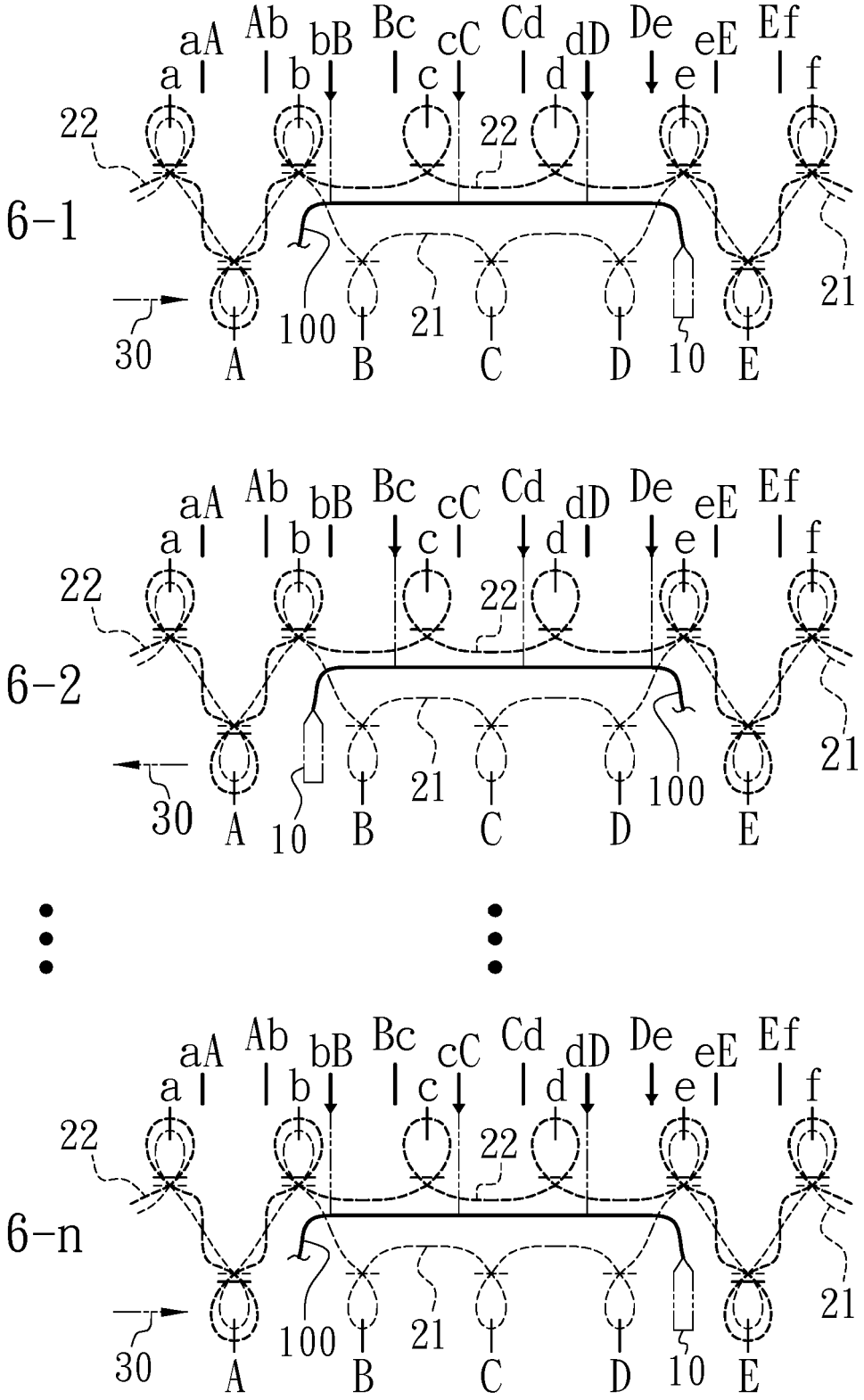
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Fig. 15

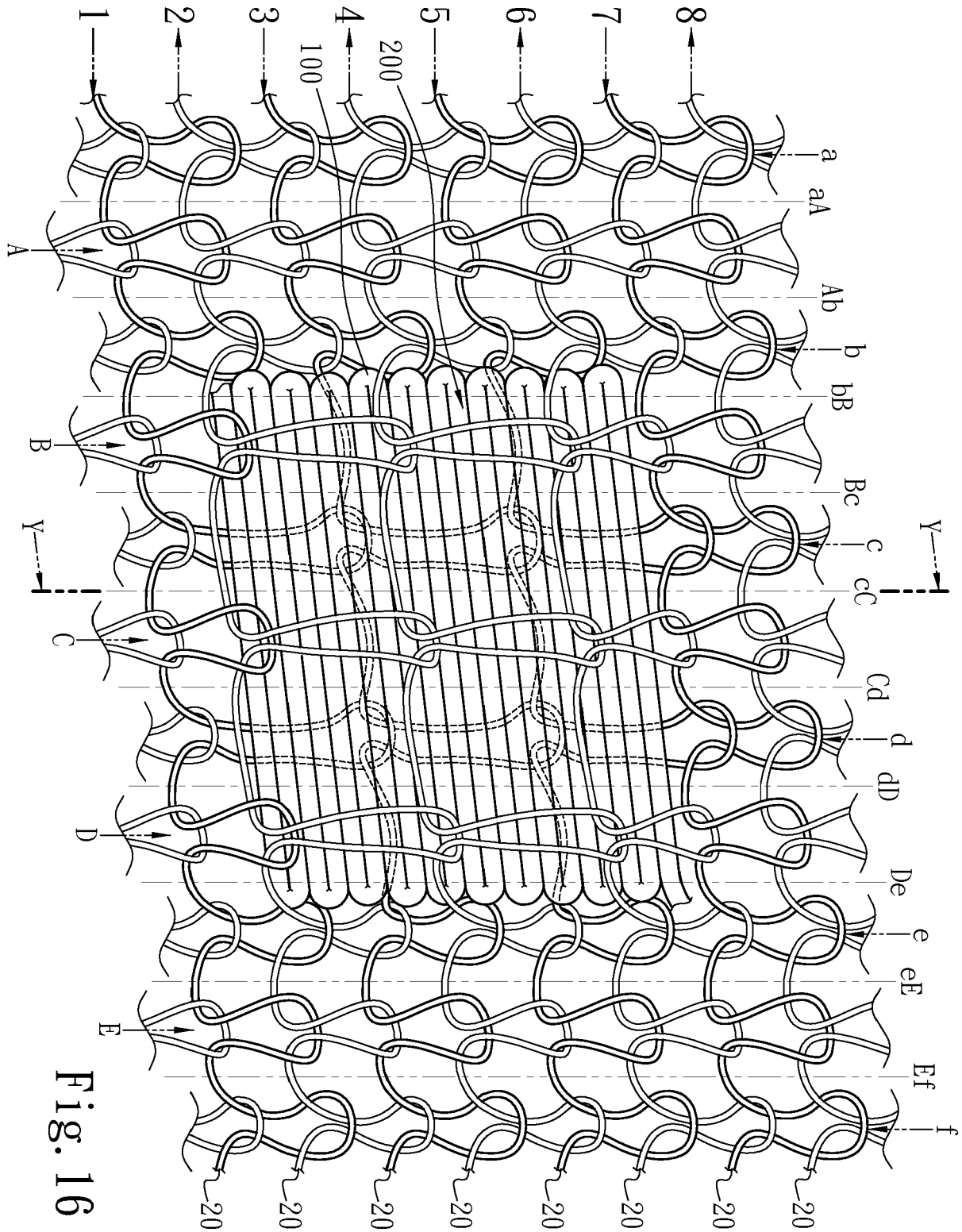


Fig. 16

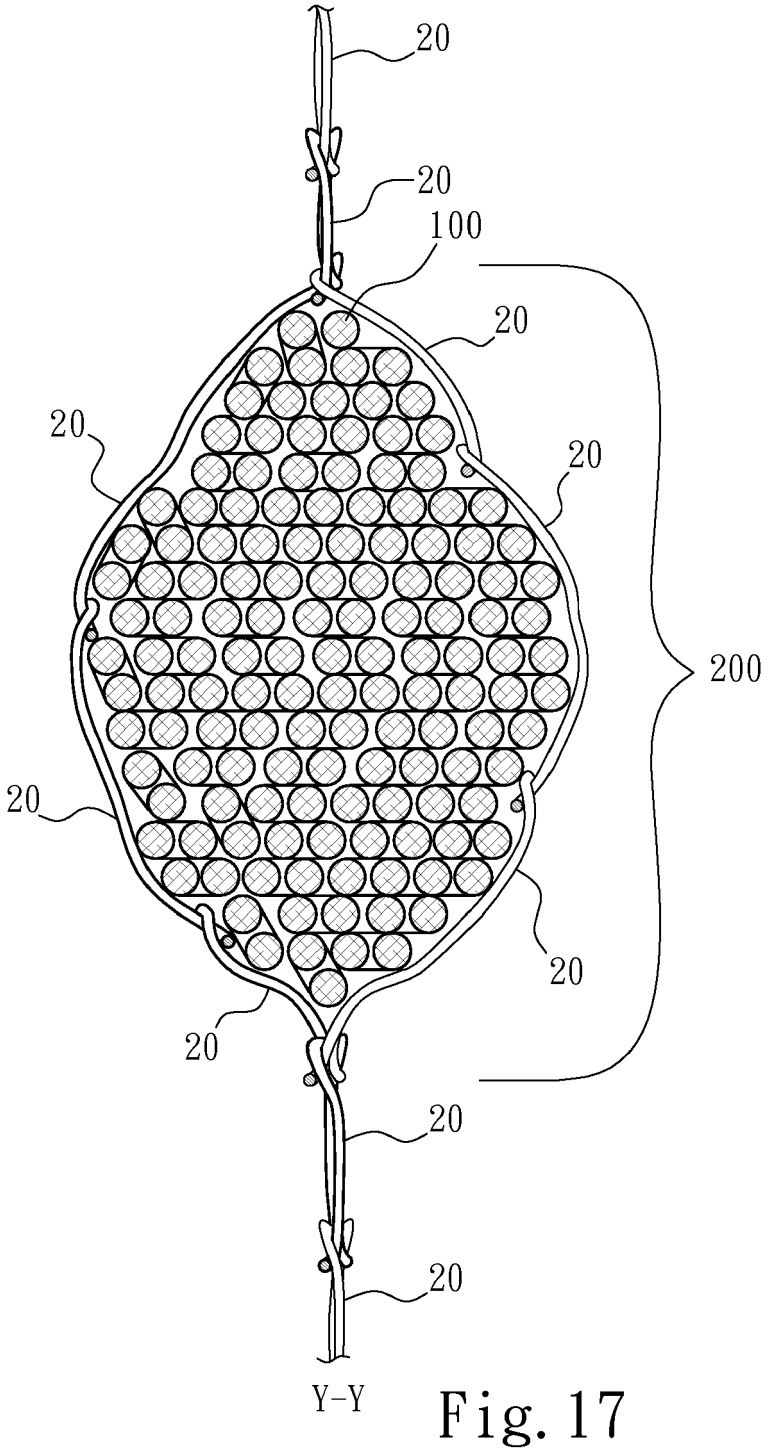
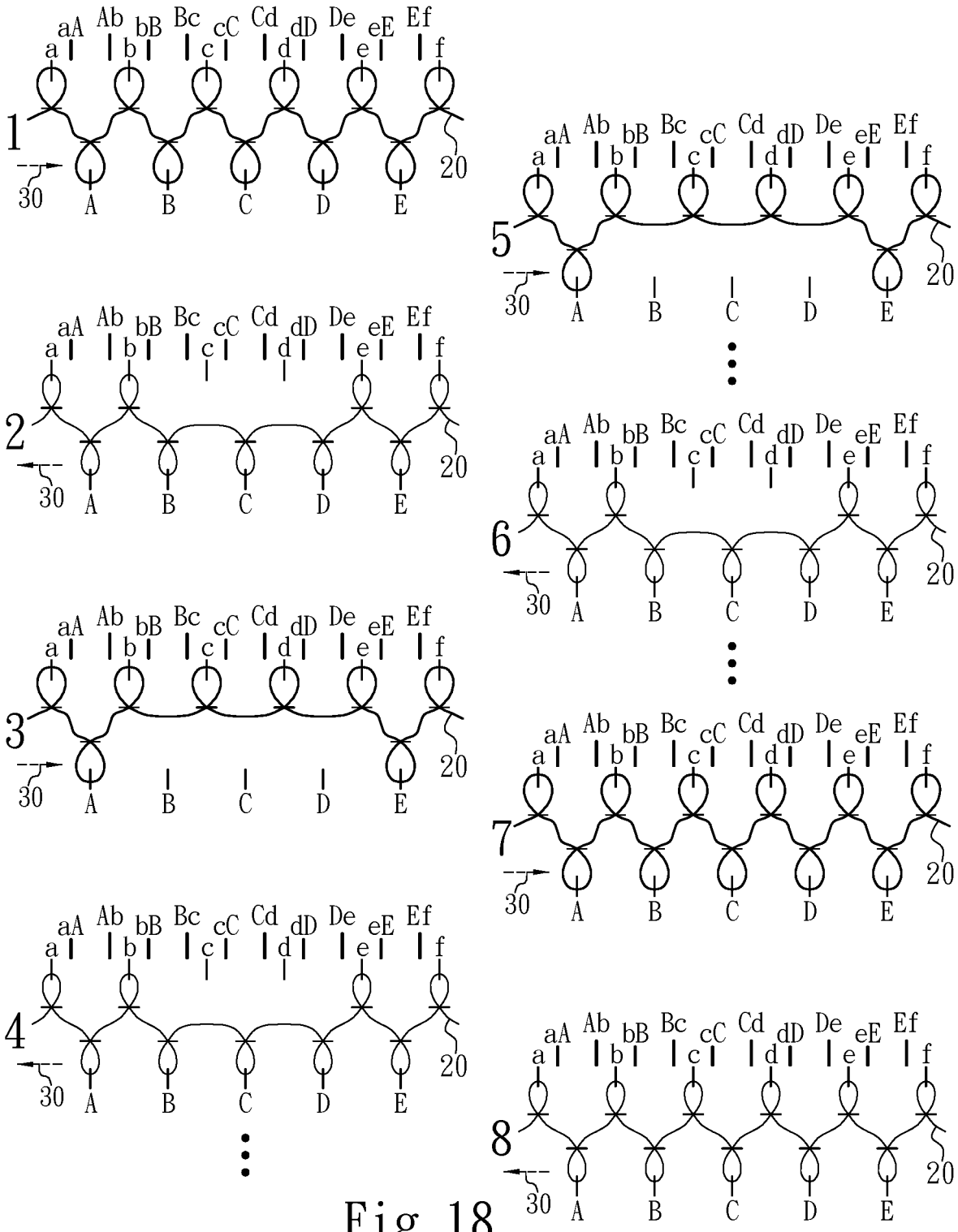


Fig. 17



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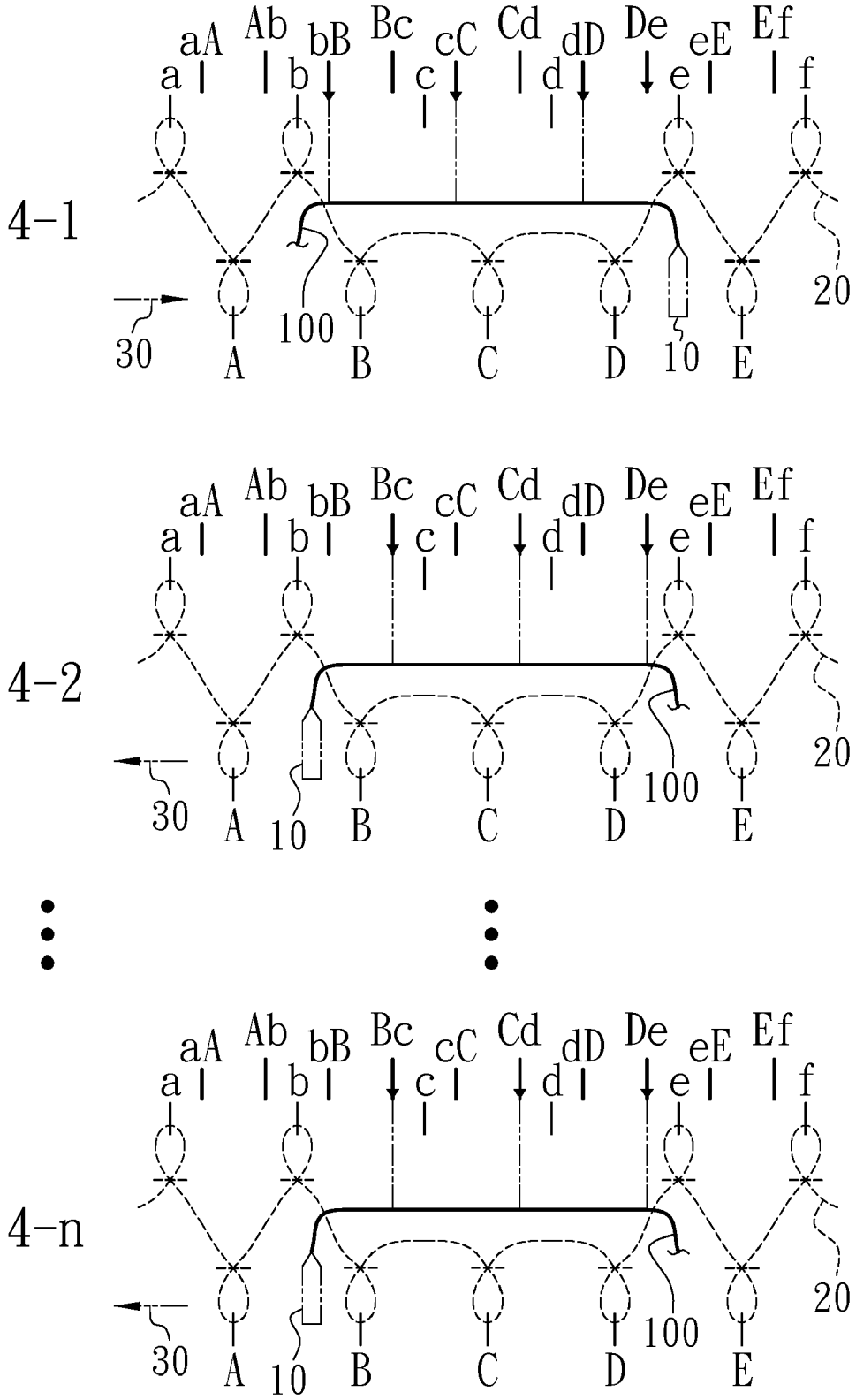
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Fig. 19

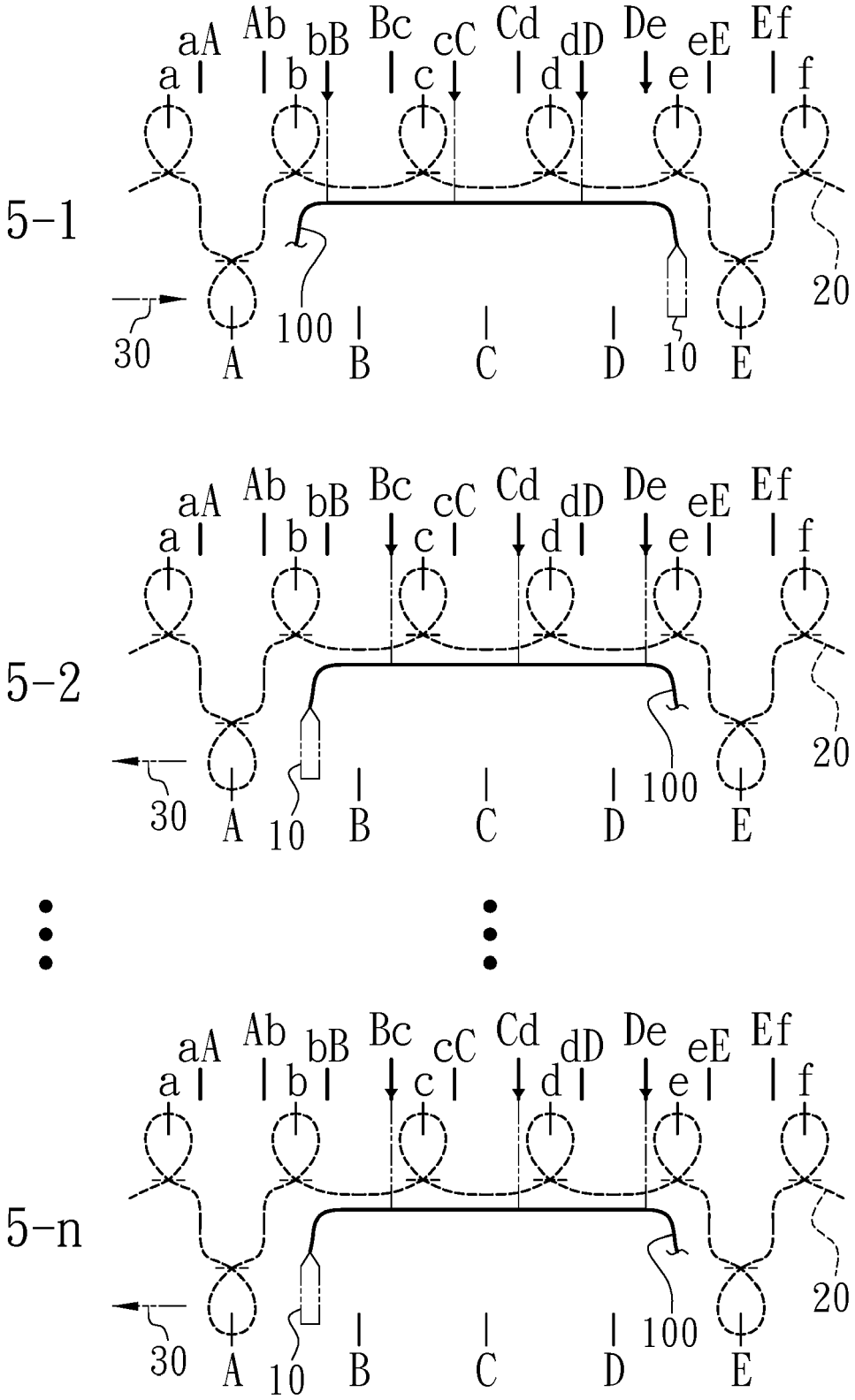
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Fig. 20

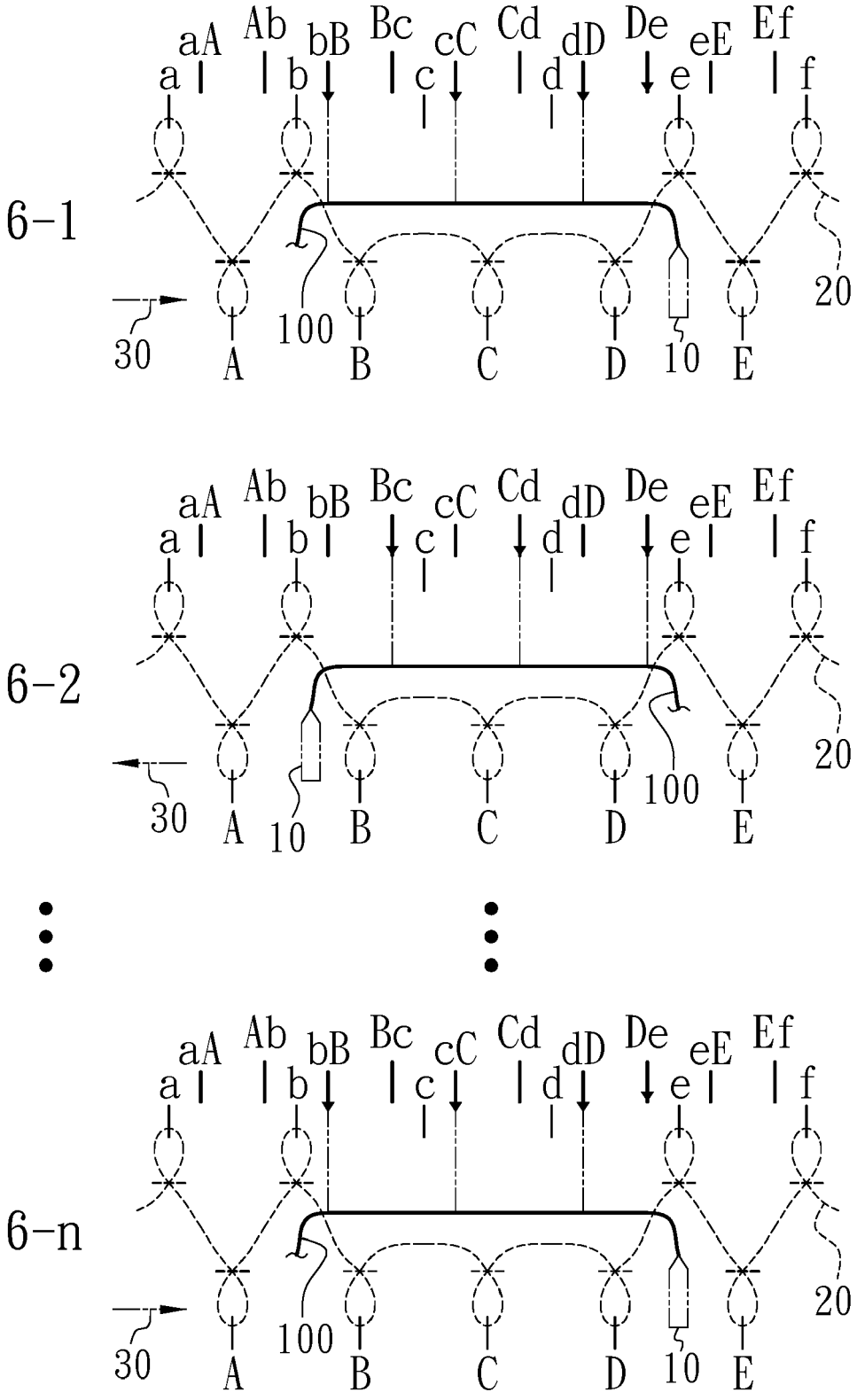
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Fig. 21

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EUROPEAN SEARCH REPORT

Application Number
EP 16 17 6639

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X	US 2010/154256 A1 (DUA BHUPESH [US]) 24 June 2010 (2010-06-24)	1-5	
A	* paragraphs [0023], [0029] - [0035], [0040], [0043], [0047], [0048]; figures 5D, 8 *	6	
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A	* paragraphs [0053], [0054]; figures 4c, 7e, 21G *	6	
X	US 3 424 220 A (SCHUERCH HANS U) 28 January 1969 (1969-01-28)	1-5	
A	* figure 6 *	6	
X	DE 20 2015 101004 U1 (BÖNNING & SOMMER GMBH & CO KG [DE]; MATTES & AMMANN GMBH & CO KG [DE]) 24 March 2015 (2015-03-24) * paragraphs [0025], [0029], [0035], [0043], [0044] *	1-6	TECHNICAL FIELDS SEARCHED (IPC) D04B
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	20 September 2016	Kirner, Katharina

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