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(54) **Process for making a knitted fabric and its product**

Strickverfahren und hergestelltes Produkt

Procédé pour réaliser un tissu et produit résultant

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EP-A- 0 490 694 GB-A- 2 097 431
US-A- 2 334 206

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Description

[0001] The present invention relates to a process for making a knitted fabric and a product obtained with this process, as well as a use for a knitting machine.

[0002] It is known that the production of fabric differs according to the type of interlacements which may be obtained either with straight threads in a process of interlacing the threads of the warp together with the threads of the weft which are perpendicularly arranged to each other, so obtaining a weave or, otherwise, with a curvilinear thread by interlacing a thread by itself, so as to make a knitting weave.

[0003] In a knitting weave a sole thread or yarn is used which extends longitudinally and curvilinearly, so as to produce loops which form a line of simple stitches linked to the stitches of the previous line and, which will be linked to the stitches of the following line.

[0004] In the specific field, the loops are called stitches, the lines of stitches are called rows and the interlacement represents the passing over phase whereby, in the following, this specific terminology will be used.

[0005] The knitting manufacturing is made by using knitting machines or looms in which a support, called a needle bar, houses several needles placed side by side and parallel to each other, in order to pass over the stitches of the new row with the stitches of the previous row. The number of needles is, obviously, equal to the number of the stitches per row. In order to make the passing over phase, the needles are operated by a slidable carriage carrying a cam element which by pressing onto the end of the needles, generates a forward and a backward movement of the needles.

[0006] By using these machines, it is also possible to generate a decrease or an increase of the fabric, namely it is possible to obtain shaped fabrics. For example, it is possible to widen a fabric (called "increase") by inserting other needles which are placed side by side to those placed at the ends; similarly, it is possible to reduce the fabric (called "decrease") by removing the needles which are placed at the ends.

[0007] In order to make stockings or the upper part of a shoe, it is necessary to build the different parts or shapes of the stocking or footwear and, then, to join them together by sewing.

[0008] Each part may be obtained starting from a rectangular fabric and cutting from it the component parts of the stocking or footwear, thus producing scraps; or, they may be directly obtained by using the increase and decrease technique, thus avoiding wastage.

[0009] In any case, the flat parts so obtained have to be sewed to one another, along different joining lines.

[0010] Subsequently, in order that the stocking or footwear perfectly takes the three-dimensional shape, it is necessary to carry out an operation of stretching which makes it possible to obtain in a definitive and uniform way a boot-like shape.

[0011] It is evident that all the above described oper-

ations, with particular reference to the decreases and increases, sewing and stretching operations, are long and expensive, above all if we think that such operations have to be carried out many times, and for each of the component part of the stocking or footwear.

[0012] Another prior art document is European EP 0490694 in the name of Shima Seiki Mfg or GB-A-1 413 988 by Courtaulds. These patents relate to methods for knitting the neck portion of a sweater, cardigan or vest and also the knit fabric obtained by these methods.

[0013] In particular, it provides a knitting method wherein the neck portion is knitted subsequently to the front portion and the number of loops existing in the edge of the cut-out neck portion of the front body is increased by an action of widening stitches.

[0014] Another prior art is US patent No.2,334,206 which relates to an elastic garment and a method of producing the same, such as a surgical stocking.

[0015] The aim of the invention is, therefore, to devise a process in order to obtain a knitted fabric which eliminates the above-mentioned drawbacks.

[0016] In particular the aim is to obtain a fabric in one piece from which it is possible to directly make the stocking or footwear, namely a fabric which has the necessary geometrical characteristics so that, once it has been folded, it directly forms the stocking or footwear.

[0017] The aim is reached by a process for making a knitted fabric comprising the phases of:

a) preparing at least a first thread which forms a first row of stitches arranged along a line placed between a left side edge and a right side edge;

b) passing over said at least a first thread with said stitches starting from said left side edge until said right side edge, thus forming a second row of stitches;

c) passing over said at least a first thread with said second row of stitches starting from said right side edge until said left side edge, thus forming a third row of simple stitches;

d) repeating the operation of phases b) and c) until to obtain a last row of stitches;

comprising the other following phases:

e) preparing at least two threads, a second thread which passes over the stitches of the last row placed between said left side edge and a first central edge placed in the middle of said last row or near said middle on the side of said left side edge, thus defining a left row of stitches and a third thread which passes over the stitches of the last row placed between said right side edge and a second central edge placed in the middle of said last row or near said middle on the side of said right side edge, thus defining a right row of stitches, the passing over operation of the same rank of left row and right row is carried out at the same time and, moreover, while proceeding with the rows of the subsequent rank, said first central edge is gradually moved to-

wards the left side edge, thus reducing the number of stitches of the left row until the number of stitches becomes zero or almost zero, and said second central edge is gradually moved towards the right side edge, thus reducing the number of stitches of the right row until the number of stitches becomes zero or almost zero, thus obtaining a fabric with a "V" shape wherein the two "V" sides are formed by said first and second central edge;

f) repeating the passing over phases a) and b), by passing over, with a sole row, the stitches of the two "V" sides with said first thread, so that in this way the fabric surplus produced by said second and third thread respectively forms a left wave in the left part and a right wave in the right part.

[0018] By this process, it is therefore possible to produce a one-piece fabric which has suitably shaped side edges (by increasing or decreasing the fabric) and, at the area corresponding to the instep of the foot and starting from the middle towards the two opposite side edges, it has an amount of fabric in excess, which is more in excess as the distance from the middle increases, so as to form two waves. In such way, the stocking or footwear is directly obtained by wrapping the fabric in a boot-like manner and carrying out a simple sewing in order to join the two side edges.

[0019] In this way, the cutting and sewing operations for each different parts of the stocking or footwear are avoided, and also the subsequent stretching operation.

[0020] In particular, during the passing over phase of the left and right row, a pulling force is applied to the fabric already obtained, so as to constantly maintain it in tension.

[0021] In such a way the fabric, so obtained, can be made into a stocking or a footwear which is form-fitting to the foot or the leg of a person.

[0022] These and other advantages of the present invention will be more evident by the following detailed description given for an exemplifying and not limiting purpose with reference to the following drawings, wherein:

- figure 1 is a top view of the fabric obtained by the process of the present invention;
- figures 2, 3, 4 and 5 are top views of the fabric represented in subsequent phases of manufacturing.

[0023] In figure 1, there is illustrated a fabric 10 in order to obtain a stocking or a footwear with the process of the present invention. Figures 2 to 5, illustrate the various phases of the process in order to produce the fabric 10, starting from the top of the stocking or the upper part of the footwear.

[0024] At the beginning, the knitting weaving is carried out in the usual manner, namely a first thread 11 creates a first row of stitches and subsequently, with a second run, a second row of stitches are formed which are

passed over with the stitches of the first row and so on, until arriving at the last row 12 of stitches near the part corresponding to the instep of the foot. Therefore, the fabric represented in figure 2 is so obtained, wherein decreases and increases operations have been made, so that the boot-leg, which is defined by a left side edge 14 and a right side edge 16, may fit to the lower part of the leg.

[0025] At this point, the first thread 11 is stopped and a second thread 13a and a third thread 13b are prepared in order to start again the knitting, which now occurs by dividing the last row 12 of stitches in two parts: a left row 20 placed between the left side edge 14 and a first central edge 15 placed near the middle on the side of the left side edge 14 and a right row 22 placed between the right side edge 16 and a second central edge 17 placed near the middle on the side of the right side edge 17.

[0026] Obviously, since the two rows are independent to each other, it is necessary to have at least two threads: the second thread 13a in order to form the left rows 20 and the third thread 13b in order to form the right rows 22.

[0027] The operation of carrying out the left rows 20 and the right rows 22 occurs simultaneously, therefore, as for example, the stitches of the left row of the third rank are passed over at the same time as the stitches of the right row of the third rank are also passed over.

[0028] As the left rows 20 and the right rows 22 are executed, the first central edge 15 is gradually moved to the left side, so as to reduce the number of stitches per row; similarly, the second central edge 17 is gradually moved to the right side, so as to reduce the number of stitches per row.

[0029] During this phase, the stitches of the row just formed are pressed downwards by means of a suitable device that is a presser bar which produces a pressure onto the stitches in order to hold the row of stitches just formed in the correct position. At the same time, upon the fabric already formed, a pulling force is applied which is uniformly distributed along its entire length by means a device, i.e. a tension bar, so as to maintain the fabric constantly in tension.

[0030] As the process is going on, since the central edges are moved towards the ends, an increasing number of stitches not passed over are formed.

[0031] While continuing with the knitting, at a certain moment the number of stitches per row becomes zero or almost zero, thus obtaining a fabric which forms, if it should be laid down on a plane, a "V", as represented in figure 3, wherein the two "V" sides are made by the first and the second central edges 15 and 17.

[0032] In practice, since the stitches are blocked by the straight needle bar of the machine, the fabric in progress is arranged as shown in figure 4, wherein the stitches of the two "V" sides, that is the first 15 and the second 17 central edge define the last row of stitches arranged in a straight line which is identified in figure with reference 24.

[0033] Therefore, the fabric has, on the left side and on the right side, a material in excess to form a left wave 18 and a right wave 19.

[0034] Finally, the stitches of the last row 24 are passed over with a sole thread and, precisely, with the first thread 11 (starting from the situation represented in figure 4) which starts again and, as previously described, forms subsequent rows of stitches. The fabric 10 depicted in figure 5 is so obtained.

[0035] When the knitting operation is ended, it is sufficient to put the left side edge 14 in contact with the right side edge 16 and joining them by sewing, thus obtaining a stocking or a footwear with a perfect and uniform shape.

[0036] The first thread 11, the second thread 13a and the third thread 13b are preferably elastic threads which may be either of natural material like latex, or synthetic material like lycra.

[0037] As shown in figure 3, at the same time the left rows 20 and the right rows 22 are carried out, an increase also occurs, and therefore new needles are added to the left row 20, the left stitches increase and then the left side edge 14 moves towards the left; similarly, new needles are added to the right row 22, the right stitches increase and then the right side edge 16 moves towards the right.

[0038] The increase during the carrying out of the left row 20 and the right row 22 is necessary in order to obtain the part of the fabric which covers the heel; in fact, the central part of the fabric covers the instep of the foot, whereas the two side parts, once they are joined together, have to cover the opposite part to the instep of the foot, that is the heel.

[0039] Obviously, all the functionally or conceptually equivalent changes or modifications fall inside the protection field of the present invention.

[0040] For example, it is possible to repeat the passing over phases by means of left rows and right rows independent to each other, interspersed with passing over phases along a sole row, so as to follow the shape of the foot instep in a better way.

[0041] Obviously, the described process may be used in order to manufacture other clothing articles, and not exclusively stockings or footwear. In general, this process may involve all those articles which cover parts of the body which have angular shapes, as for example orthopaedic and medical-sanitary articles which cover different parts of the body, such as elbows and shoulders.

[0042] Furthermore, instead to use a sole thread 13a in order to form the left rows and a sole thread 13b in order to form the right rows, a greater number of threads can be used, so as to increase the productivity or, otherwise, the design when, for example, different colours of threads are used.

[0043] In the same way, instead of using a sole thread 11 in order to form the initial or the final part of the fabric, a greater number of threads can be used.

[0044] The process is carried out conveniently using a knitting machine and, in particular, a machine with a straight needle bar.

[0045] The protection field of the invention extends also to the use of any machine in order to carry out the above process, as well as the fabric obtained by carrying out the process of the present invention.

10 Claims

1. A process for making a knitted fabric (10) comprising the phases of:

- a) preparing at least a first thread (11) which forms a first row of stitches arranged along a line placed between a left side edge (14) and a right side edge (16);
- b) passing over said at least a first thread (11) with said stitches starting from said left side edge (14) until said right side edge (16), thus forming a second row of stitches;
- c) passing over said at least a first thread (11) with said second row of stitches starting from said right side edge (16) until said left side edge (14), thus forming a third row of simple stitches;
- d) repeating the operation of phases b) and c) until to obtain a last row (12) of stitches; comprising the other following phases:
- e) preparing at least two threads, a second thread (13a) which passes over the stitches of the last row (12) placed between said left side edge (14) and a first central edge (15) placed in the middle of said last row or near said middle on the side of said left side edge (14), thus defining a left row (20) of stitches and a third thread (13b) which passes over the stitches of the last row (12) placed between said right side edge (16) and a second central edge (17) placed in the middle of said last row or near said middle on the side of said right side edge (16), thus defining a right row (22) of stitches, the passing over operation of the same rank of left row (20) and right row (22) is carried out at the same time, **characterised by** while proceeding with the rows of the subsequent rank, said first central edge (15) is gradually moved towards the left side edge (14), thus reducing the number of stitches of the left row (20) until the number of stitches becomes zero or almost zero, and said second central edge (17) is gradually moved towards the right side edge (16), thus reducing the number of stitches of the right row (22) until the number of stitches becomes zero or almost zero, thus obtaining a fabric with a "V" shape wherein the two "V" sides are formed by said first and second central edge (15,17);

- f) arranging in a straight line the stitches of the two "V" sides, that is the first 15 and second 17 central edge, and repeating the passing over phases a) and b), by passing over, with a sole row (24), the stitches of the two "V" sides with said first thread (11), so that in this way the fabric surplus produced by said second (13a) and third (13b) thread respectively forms a left wave (18) in the left part and a right wave (19) in the right part.
2. Process according to claim 1, **characterized in that** as the rank of the left rows (20) and the right rows (22) increases, new stitches are added at the left end of the left row (20), thus moving said left side edge (14) towards the left and, at the same time, new stitches are added at the right end of the right row (22), thus moving said right side edge (16) towards the right, so as to obtain an increased fabric.
 3. Process according to claim 1, **characterized in that** as the rank of the left rows (20) and the right rows (22) increases, the stitches on the left end of the left row (20) are decreased, thus moving said left side edge (14) towards the right and, at the same time, the stitches on the right end of the right row (22) are decreased, thus moving said right side edge (16) towards the left, so as to obtain a decreased fabric.
 4. Process according to any of the previous claims, **characterized in that** in the phase e) two threads are prepared in order to obtain said left rows (20) and another two threads in order to obtain said right rows (22), in order to make a Jacquard knitting.
 5. Process according to any of the previous claims, **characterized in that** during the phase e), namely during the passing over operation of said left (20) and right (22) rows, the stitches in progress are pressed downwards.
 6. Process according to any of the previous claims, **characterized in that** during the phase e), namely during the passing over operation of said left (20) and right (22) rows, a pulling force is applied to the fabric already formed, in order to maintain it under a constant tension.
 7. Process according to any of the previous claims, **characterized in that** phases e) and f), are repeated more than one time and they are alternated with phases a) and b).
 8. Process according to any of the previous claims, **characterized in that** it is carried out by using a knitting machine.
 9. Process according to claim 7, **characterized in that** said knitting machine has a straight needle bar.
 10. Process according to claims 5 and 8, **characterized in that** said stitches in progress are pressed downwards by a presser device.
 11. Process according to claims 8, **characterized in that** said pulling force applied to the fabric, according to claim 6, is exerted by a tension device.
 12. Process according to any of the previous claims, **characterized in that** said at least first thread (11), said second thread (13a) and said third thread (13b) are elastic.
 13. Process according to claim 12, **characterized in that** said elastic threads are made of latex or lycra.
 14. Process according to claim 1, **characterized in that** said left edge (14) is put in contact with the right side edge (16) and joining them by sewing.
 15. Folded knitted one-piece fabric (10) obtainable by the process according to claim 14, having shaped side edges (14, 16) by increasing or decreasing the fabric (10), the side edges being joined by sewing, **characterised by** having an amount of fabric in excess forming two waves (18, 19).
 16. Knitted fabric according to claim 15, **characterized in that** it is a product (10) designed to cover a joint of the human body.
 17. Knitted fabric according to claim 16, **characterized in that** said fabric is a stocking (10) or a footwear which suitably covers the instep of a foot.
 18. Knitted fabric according to claim 16, **characterized in that** said fabric is an orthopaedic or a medical-sanitary article, such as knee-bands or the like.
 19. Use of a knitting machine in order to carry out the process according to any of the claims 1 to 13.
- Patentansprüche**
1. Verfahren zur Herstellung einer Maschenware (10) mit folgenden Phasen:
 - a) Bereitstellung zumindest eines ersten Fadens (11), der eine erste Reihe von Maschen bildet, die entlang einer Linie angeordnet ist, die sich zwischen einem linken Seitenrand (14) und einem rechten Seitenrand (16) befindet;
 - b) Verkreuzen des zumindest ersten Fadens

(11) mit den Maschen, beginnend vom linken Seitenrand (14) bis zum rechten Seitenrand (16), wodurch eine zweite Reihe von Maschen gebildet wird;

c) Verkreuzen des zumindest ersten Fadens (11) mit der zweiten Reihe von Maschen, beginnend am rechten Seitenrand (16) bis zum linken Seitenrand (14), wodurch eine dritte Reihe aus einfachen Maschen gebildet wird;

d) Wiederholen der Vorgänge der Phasen b) und c), bis eine letzte Reihe (12) von Maschen erhalten wird;

mit den anderen, folgenden Phasen:

Bereitstellung von zumindest zwei Fäden, eines zweiten Fadens (13a), der die Maschen der letzten Reihe (12) überkreuzt, die zwischen dem linken Seitenrand (14) und einem ersten zentralen Rand (15) angeordnet ist, der in der Mitte der letzten Reihe oder in der Nähe der Mitte an der Seite des linken Seitenrandes (14) angeordnet ist, wodurch eine linke Reihe (20) von Maschen festgelegt wird, und eines dritten Fadens (13b), der die Maschen der letzten Reihe (12) überkreuzt, die zwischen dem rechten Seitenrand (16) und einem zweiten zentralen Rand (17) angeordnet ist, der in der Mitte der letzten Reihe oder in der Nähe der Mitte auf der Seite des rechten Seitenrandes (16) angeordnet ist, wodurch eine rechte Reihe (22) von Maschen ausgebildet wird, wobei der Verkreuzungsvorgang mit demselben Rang der linken Reihe (20) und der rechten Reihe (22) gleichzeitig durchgeführt wird, **dadurch gekennzeichnet, dass** bei der Fortsetzung mit den Reihen des folgenden Ranges der erste zentrale Rand (15) allmählich zum linken Seitenrand (14) hin bewegt wird, wodurch die Anzahl an Maschen der linken Reihe (20) verringert wird, bis die Anzahl an Maschen gleich Null oder beinahe Null wird, und der zweite zentrale Rand (17) allmählich zum rechten Seitenrand (16) hin bewegt wird, wodurch die Anzahl an Maschen der rechten Reihe (22) verringert wird, bis die Anzahl an Maschen gleich Null oder beinahe Null wird, wodurch eine Ware in Form eines "V" erhalten wird, wobei die beiden Seiten des "V" durch den ersten und den zweiten zentralen Rand (15, 17) gebildet werden;

e) Anordnen der Maschen der beiden Seiten des "V" entlang einer geraden Linie, also dem

ersten (15) und dem zweiten (17) zentralen Rand, und Wiederholen der Verkreuzungsphasen (a) und (b), durch Überkreuzen, mit einer einzigen Reihe (24), der Maschen der beiden Seiten des "V" mit dem ersten Faden (11), so dass auf diese Weise die überschüssige Ware, die durch den zweiten (13a) und den dritten (13b) Faden erzeugt wird, eine linke Welle (18) in dem linken Teil bzw. eine rechte Welle (19) in dem rechten Teil bildet.

2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** dann, wenn der Rang der linken Reihen (20) und der rechten Reihen (22) zunimmt, neue Maschen an dem linken Ende der linken Reihe (20) hinzugefügt werden, wodurch der linke Seitenrand (14) nach links bewegt wird, und gleichzeitig neue Maschen an dem rechten Ende der rechten Reihe (22) hinzugefügt werden, wodurch der rechte Seitenrand (16) nach rechts bewegt wird, um so eine vergrößerte Ware zu erhalten.

3. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** dann, wenn der Rang der linken Reihen (20) und der rechten Reihen (22) zunimmt, die Maschen am linken Ende der linken Reihe (20) verringert werden, wodurch der linke Seitenrand (14) nach rechts bewegt wird, und gleichzeitig die Maschen am rechten Ende der rechten Reihe (22) verringert werden, wodurch der rechte Seitenrand (16) nach links bewegt wird, um so eine verkleinerte Ware zu erhalten.

4. Verfahren nach einem der voranstehenden Ansprüche, **dadurch gekennzeichnet, dass** in der Phase e) zwei Fäden vorbereitet werden, um die linken Reihen (20) zu erhalten, und zwei andere Fäden, um die rechten Reihen (22) zu erhalten, um eine Jacquard-Bindung zu erzeugen.

5. Verfahren nach einem der voranstehenden Ansprüche, **dadurch gekennzeichnet, dass** während der Phase e), nämlich während des Verkreuzungsvorgangs der linken (20) und der rechten (22) Reihe, die Maschen beim Fortgang nach unten gedrückt werden.

6. Verfahren nach einem der voranstehenden Ansprüche, **dadurch gekennzeichnet, dass** während der Phase e), nämlich während des Verkreuzungsvorgangs der linken (20) und der rechten (22) Reihe, eine Zugkraft auf die bereits hergestellte Ware einwirkt, um sie unter konstanter Spannung zu halten.

7. Verfahren nach einem der voranstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Phasen e) und f) mehr als einmal wiederholt werden, und sich mit den Phasen a) und b) abwechseln.

8. Verfahren nach einem der voranstehenden Ansprüche, **dadurch gekennzeichnet, dass** es unter Verwendung einer Strickmaschine durchgeführt wird.
9. Verfahren nach Anspruch 8, **dadurch gekennzeichnet, dass** die Strickmaschine eine gerade Nadelstange aufweist. 5
10. Verfahren nach Ansprüchen 5 und 8, **dadurch gekennzeichnet, dass** die Maschen im Fortgang durch eine Stoffdrückervorrichtung nach unten gedrückt werden. 10
11. Verfahren nach Anspruch 8, **dadurch gekennzeichnet, dass** die Zugkraft, die auf die Ware gemäß Anspruch 6 aufgebracht wird, von einer Zugvorrichtung ausgeübt wird. 15
12. Verfahren nach einem der voranstehenden Ansprüche, **dadurch gekennzeichnet, dass** der zumindest erste Faden (11), der zweite Faden (13a) und der dritte Faden (13b) elastisch sind. 20
13. Verfahren nach Anspruch 12, **dadurch gekennzeichnet, dass** die elastischen Fäden aus Latex oder Lycra bestehen. 25
14. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** der linke Rand (14) in Kontakt mit dem rechten Seitenrand (16) gebracht wird, und die Ränder durch Nähen verbunden werden. 30
15. Gefaltete Maschenware (10), die durch das Verfahren gemäß Anspruch 14 erhältlich ist, und durch Vergrößern oder Verkleinern der Ware (10) geformte Seitenränder (14, 16) aufweist, wobei die Seitenränder durch Nähen verbunden sind, **dadurch gekennzeichnet, dass** eine überschüssige Menge an Ware vorhanden ist, welche zwei Wellen (18, 19) bildet. 35 40
16. Maschenware nach Anspruch 15, **dadurch gekennzeichnet, dass** sie ein Erzeugnis (10) ist, das dazu ausgebildet ist, ein Gelenk des menschlichen Körpers abzudecken. 45
17. Maschenware nach Anspruch 16, **dadurch gekennzeichnet, dass** die Ware ein Strumpf (10) oder ein Fußbekleidungsstück ist, der bzw. das den Spann eines Fußes abdeckt. 50
18. Maschenware nach Anspruch 16, **dadurch gekennzeichnet, dass** die Ware ein orthopädischer oder medizinischer Gegenstand ist, beispielsweise Kniebinden oder dergleichen. 55
19. Verwendung einer Strickmaschine zur Durchführung des Verfahrens nach einem der Ansprüche 1

bis 13.

Revendications

1. Procédé pour réaliser un tricot (10) comprenant les étapes consistant à :

a) préparer au moins un premier fil (11) qui forme une première rangée de mailles agencées le long d'une ligne située entre un rebord de côté gauche (14) et un rebord de côté droit (16) ;
 b) faire traverser cet au moins un premier fil (11) avec les mailles commençant à partir du rebord de côté gauche (14) jusqu'au rebord de côté droit (16), formant ainsi une seconde rangée de mailles ;

c) faire traverser le au moins un premier fil (11) avec la seconde rangée de mailles en commençant du rebord de côté droit (16) jusqu'au rebord de côté gauche (14), formant ainsi une troisième rangée de mailles ;

d) répéter l'opération des phases b) et c) jusqu'à l'obtention de la dernière rangée (12) de mailles,

comprenant les autres étapes suivantes :

e) préparer au moins deux fils, un second fil (13a) qui traverse les mailles de la dernière rangée (12) placée entre le rebord de côté gauche (14) et un premier rebord central (15) placé au milieu de la dernière rangée ou près du milieu sur le côté du rebord de côté gauche (14), définissant ainsi une rangée gauche (20) de mailles et un troisième fil (13b) qui traverse les mailles de la dernière rangée (12) placée entre le rebord de côté droit (16) et un second rebord central (17) placé au milieu de la dernière rangée ou près du milieu sur le côté du rebord de côté droit (16), définissant ainsi une rangée droite (22) de mailles, l'opération de traversée du même rang de la rangée gauche (20) et la rangée droite (22) étant réalisée en même temps,

caractérisé en ce que

pendant que l'on continue avec les rangées du rang suivant, le premier rebord central (15) est déplacé petit à petit vers le rebord de côté gauche (14), réduisant ainsi le nombre de mailles de la rangée gauche (20) jusqu'à ce que le nombre de mailles atteigne zéro ou presque zéro, et le second rebord central (17) est déplacé petit à petit vers le rebord de côté droit (16), réduisant ainsi le nombre de mailles de la rangée droite (22) jusqu'à ce que le nombre de mailles atteigne zéro ou presque zéro, ce qui permet l'obtention d'un tricot ayant une forme de « V » dans lequel les deux côtés du « V » sont formés par le premier et le second rebord

central (15, 17) ;

f) disposer en ligne droite les mailles des deux côtés du « V », c'est à dire le premier rebord central 15 et le second rebord central 17, et répéter les phases a) et b) de traversée, en traversant, avec une seule rangée (24), les mailles des deux côtés du « V » avec le premier fil (11), de telle sorte que, de cette manière, le surplus de tricot produit par le second fil (13a) et le troisième fil (13b) forme respectivement une vague gauche (18) dans la partie gauche et une vague droite (19) dans la partie droite.

2. Procédé selon la revendication 1, **caractérisé en ce que** lorsque le rang des rangées gauches (20) et des rangées droites (22) augmente, de nouvelles mailles sont ajoutées à l'extrémité gauche de la rangée gauche (20), ce qui fait ainsi se déplacer le rebord de côté gauche (14) vers la gauche et, en même temps, des nouvelles mailles sont ajoutées à l'extrémité droite de la rangée droite (22), ce qui fait se déplacer le rebord de côté droit (16) vers la droite, de manière à obtenir un tricot augmenté.
3. Procédé selon la revendication 1, **caractérisé en ce que** lorsque le rang des rangées gauches (20) et des rangées droites (22) augmente, les mailles sur l'extrémité gauche de la rangée gauche (20) sont diminuées, ce qui fait se déplacer le rebord de côté gauche (14) vers la droite et, en même temps, les mailles sur l'extrémité droite de la rangée droite (22) sont diminuées, ce qui fait se déplacer le rebord de côté droit (16) vers la gauche, de manière à obtenir un tricot diminué.
4. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce que** dans la phase e) deux fils sont préparés afin d'obtenir les rangées gauches (20) et deux autres fils sont préparés afin d'obtenir les rangées droites (22), afin de faire un tricot Jacquard.
5. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce que** dans la phase e), à savoir pendant l'opération de traversée des rangées gauche (20) et droite (22), les mailles en cours sont appuyées vers le bas.
6. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce que** dans la phase e), à savoir pendant l'opération de traversée des rangées gauche (20) et droite (22), une force de traction est appliquée au tricot déjà for-

mé, afin de le maintenir à une tension constante.

7. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les phases e) et f) sont répétées plus d'une fois et sont alternées avec les phases a) et b).
8. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'** il est réalisé en utilisant une machine à tricoter.
9. Procédé selon la revendication 7, **caractérisé en ce que** la machine à tricoter possède une barre d'aiguilles droite.
10. Procédé selon les revendications 5 et 8, **caractérisé en ce que** les mailles en cours sont appuyées vers le bas par un dispositif de pression.
11. Procédé selon la revendication 8, **caractérisé en ce que** la force de traction appliquée au tricot, selon la revendication 6, est exercée par un dispositif de tension.
12. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le premier fil (11), le second fil (13a) et le troisième fil (13b) sont élastiques.
13. Procédé selon la revendication 12, **caractérisé en ce que** les fils élastiques sont faits en latex ou en lycra.
14. Procédé selon la revendication 1, **caractérisé en ce que** le rebord gauche (14) est mis en contact avec le rebord de côté droit (16) et ils sont joints par couture.
15. Tricot d'une seule pièce plié (10) pouvant être obtenu suivant le procédé selon la revendication 14, ayant des rebords de côté formés (14, 16) en augmentant ou en diminuant le tricot (10), les rebords de côté étant joints par couture, **caractérisé en ce qu'** il possède une quantité de tricot en trop formant deux vagues (18,19).
16. Tricot selon la revendication 15, **caractérisé en ce qu'** il s'agit d'un produit (10) conçu pour couvrir une articulation du corps humain.

17. Tricot selon la revendication 16,
caractérisé en ce que
le tricot est un bas ou un chausson qui couvre de
manière adéquate le cou-de-pied.

5

18. Tricot selon la revendication 16,
caractérisé en ce que
le tricot est un article orthopédique ou médico-sa-
nitaire, tel qu'une bande de genou ou article simi-
laire.

10

19. Utilisation d'une machine à tricoter afin de réaliser
le procédé selon l'une quelconque des revendica-
tions 1 à 13.

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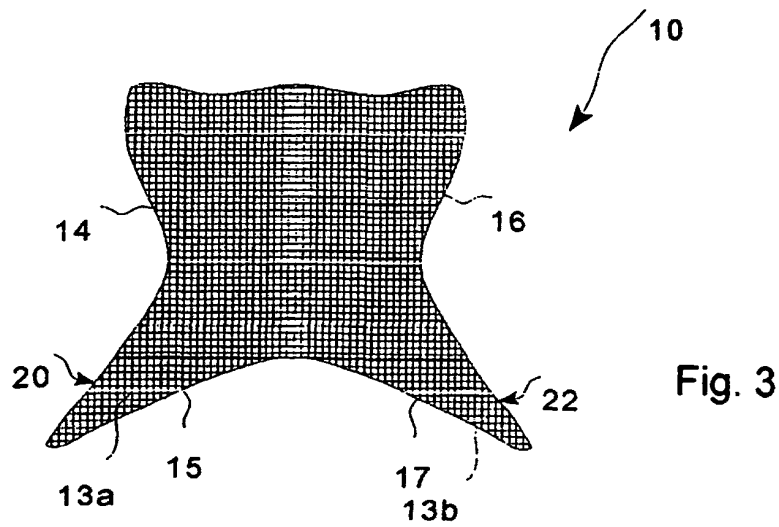
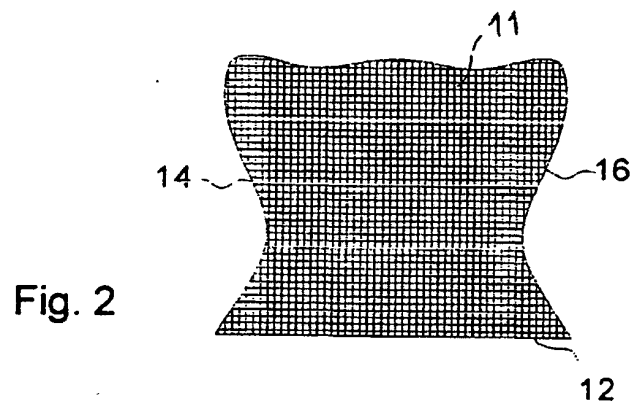
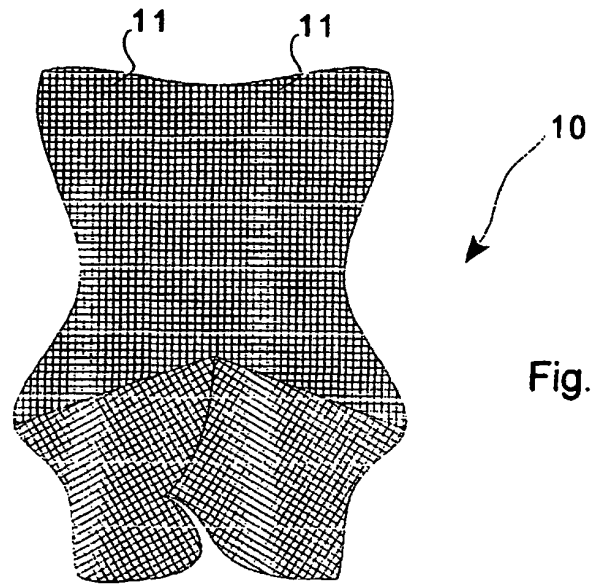
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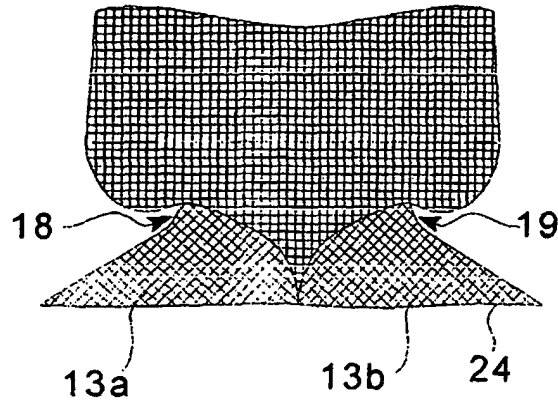


Fig. 4

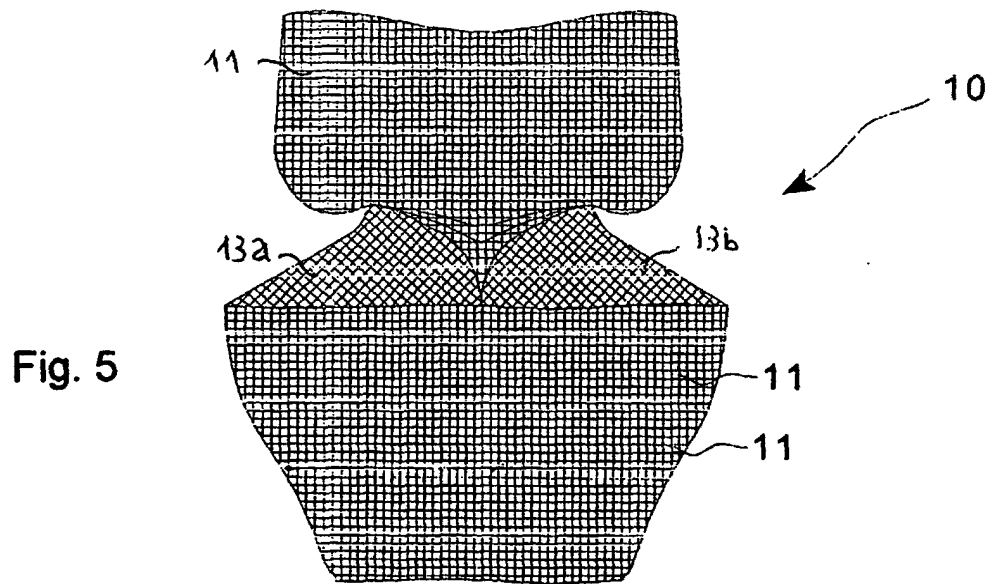


Fig. 5