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(54) **METHOD FOR KNITTING A DOUBLE-SIDED CLOTH COMPRISING CUT-PILE FABRICS WITH A CIRCULAR KNITTING MACHINE**

(57) A method (10) for knitting a double-sided cloth (20) comprising cut-pile fabrics with a circular knitting machine (30), wherein the double-sided cloth (20) is composed of a first surface layer (21) and a second surface layer (22). The method (10) includes: operating by one of the needle beds (31) to knit the first surface layer (21); then operating another one of the needle beds (32) to knit a bottom yarn texture (221) and a plurality of loops (225) connected to the bottom yarn texture (221), and driving a plurality of trimmers (324) disposed on the same needle bed (32) to cut the plurality of loops (225) to form the plurality of cut-pile fabrics (222), and constituting of the second surface layer (22) by the plurality of cut-pile fabrics (222) and the bottom yarn texture (221); and finally operating the two needle beds (31, 32) simultaneously, and connecting the first surface layer (21) with the second surface layer (22) by a plurality of connecting yarns (23) to knit the double-sided cloth (20) comprising the cut-pile fabrics.

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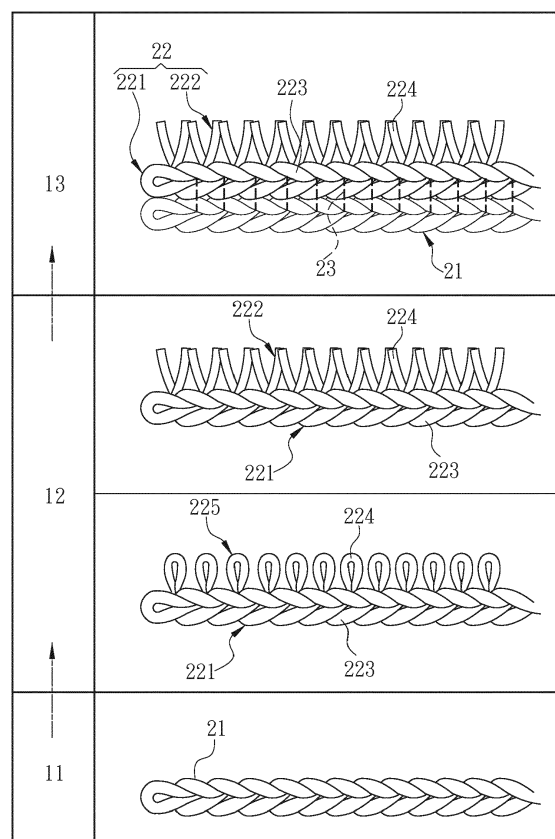


Fig. 1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a knitting method of a circular knitting machine, and in particular, to a method for knitting double-sided cloth comprising cut-pile fabrics with a circular knitting machine.

BACKGROUND OF THE INVENTION

[0002] Currently, patents for knitting cloth comprising cut-pile fabrics with a circular knitting machine are disclosed in US Patent No. 4,592,212, US Patent No. 4,409,800, US Patent No. 9,890,486 and GB Patent No. 988,865, however, the cloth knitted by the foregoing patents only has one side, so if the manufacturer wants to increase the richness, heat preservation property or textural diversity of the cloth, it needs to bond another single-sided cloth to make double-sided cloth comprising cut-pile fabrics.

[0003] Moreover, the foregoing two pieces of single-sided cloth shall be bonded with glue, and in order to meet basic requirements of the cloth such as repeated cleaning, the glue shall have a strong viscosity. This will cause the glue to become more toxic, and make customers with more sensitive skin prone to allergic problems. In addition, the foregoing glue is a compound, which will lead to environmental pollution if it is improperly discharged to the surrounding environment.

SUMMARY OF THE INVENTION

[0004] The main objective of the present invention is to solve the problem that the double-sided cloth comprising cut-pile fabrics cannot be knitted at one time and needs extra processing.

[0005] The secondary objective of the present invention is to make the double-sided cloth comprising the cut-pile fabrics bond without glue, so as to avoid the harm of glue residues to human health.

[0006] To achieve the foregoing objectives, the present invention provides a method for knitting a double-sided cloth comprising cut-pile fabrics with a circular knitting machine. The double-sided cloth comprising the cut-pile fabrics is composed of a first surface layer and a second surface layer connected with the first surface layer. A plurality of cut-pile fabrics are formed on one side of the second surface layer relative to the first surface layer. The circular knitting machine comprises two correspondingly disposed needle beds. The method includes:

a first surface layer knitting step: operating by one of the needle beds to knit the first surface layer;
a second surface layer knitting step: operating another one of the needle beds to knit a bottom yarn texture and a plurality of loops connected to the bot-

tom yarn texture, and driving a plurality of trimmers disposed on the needle bed which knits the bottom yarn texture and the plurality of loops to cut the plurality of loops to form the plurality of cut-pile fabrics respectively connected to the bottom yarn texture, and constituting of the second surface layer by the plurality of cut-pile fabrics and the bottom yarn texture; and

an interweaving step: operating the two needle beds simultaneously, and connecting the first surface layer with the second surface layer by a plurality of connecting yarns, so as to knit the double-sided cloth comprising the cut-pile fabrics.

[0007] In one embodiment, in the step for knitting the second surface layer knitting, two yarns are fed into one of the needle beds in the knitting process. One of the two yarns is knitted into the bottom yarn texture, and another one of the yarns is connected with the bottom yarn texture and is hooked and hung to form one of the plurality of loops.

[0008] In one embodiment, one of the yarns forming the plurality of loops is a wool yarn.

[0009] In addition to the foregoing embodiments, the present invention further provides another method for knitting the double-sided cloth comprising the cut-pile fabrics. The method includes:

a second surface layer knitting step: operating one of the needle beds to knit a bottom yarn texture and a plurality of loops connected to the bottom yarn texture, driving a plurality of trimmers disposed on the needle bed which knits the bottom yarn texture and the plurality of loops to cut the plurality of loops to form the plurality of cut-pile fabrics respectively connected to the bottom yarn texture, and constituting of the second surface layer by the plurality of cut-pile fabrics and the bottom yarn texture;

a first surface layer knitting step: operating another one of the needle beds to knit the first surface layer; and

an interweaving step: operating the two needle beds simultaneously, and connecting the first surface layer with the second surface layer by a plurality of connecting yarns, so as to knit the double-sided cloth comprising the cut-pile fabrics.

[0010] Compared with the prior art, the foregoing embodiments of the present invention have the following characteristics: by the method of the present invention, the double-sided cloth comprising the cut-pile fabrics is directly knitted by the circular knitting machine, which simplifies the production procedure of the double-sided cloth comprising the cut-pile fabrics. In addition, the two cloth layers of the double-sided cloth comprising the cut-pile fabrics of the present invention are bonded without glue, so as to avoid the harms of glue residues to the human health.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011]

Fig. 1 is a flow chart of a method according to one embodiment of the present invention.

Fig. 2 is a structural schematic diagram of double-sided cloth comprising cut-pile fabrics according to one embodiment of the present invention.

Fig. 3 is a structural schematic diagram of a circular knitting machine used according to one embodiment of the present invention.

Fig. 4 is a flow chart of a method according to another embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED

EMBODIMENTS

[0012] The detailed description and technical content of the present invention are described below with reference to the accompanying drawings.

[0013] Referring to Figs. 1, 2 and 3, the present invention provides a method 10 for knitting a double-sided cloth 20 comprising cut-pile fabrics with a circular knitting machine 30. The double-sided cloth 20 of the invention comprising cut-pile fabrics is described at first. The double-sided cloth 20 comprising cut-pile fabrics is composed of a first surface layer 21 and a second surface layer 22 connected with the first surface layer 21. Further, the second surface layer 22 is composed of a bottom yarn texture 221 and a plurality of cut-pile fabrics 222 connected to the bottom yarn texture 221. Further, the bottom yarn texture 221 described herein is formed by interweaving a yarn 223. The plurality of cut-pile fabrics 222 are respectively formed by cutting another yarn 224 which is ringed. Further, the circular knitting machine 30 for implementing the method 10 of the present invention includes two needle beds 31 and 32 disposed correspondingly, as shown in Fig. 3. Further, a plurality of knitting needles 311 and 321 are arranged on the two needle beds 31 and 32. One of the needle beds 32 for knitting the second surface layer 22 is further provided with a plurality of sinkers 322 for hanging a yarn, a plurality of hooking needles 323 coordinating with the plurality of sinkers 322 to implement hanging the yarn, and a plurality of trimmers 324. In one embodiment, each of the plurality of trimmers 324 and one of the knitting needles 321 are integrally formed.

[0014] According to the above, referring to Fig. 1, in the present embodiment, the method 10 includes:

a first surface layer knitting step 11: operating one of the needle beds 31 to knit the first surface layer 21; a second surface layer knitting step 12: operating another one of the needle beds 32 to knit the bottom yarn texture 221 and a plurality of loops 225 connected to the bottom yarn texture 221, driving the

plurality of trimmers 324 disposed on the needle bed 32 which knits the bottom yarn texture and the plurality of loops to cut the plurality of loops 225 so that the plurality of cut-pile fabrics 222 are formed and respectively connected to the bottom yarn texture 221, and constituting of the second surface layer 22 by the plurality of cut-pile fabrics 222 and the bottom yarn texture 221; and

an interweaving step 13: operating the two needle beds 31 and 32 simultaneously, and connecting the first surface layer 21 and the second surface layer 22 by a plurality of connecting yarns 23, so as to knit the double-sided cloth 20 comprising the cut-pile fabrics.

[0015] The implementing process of the method 10 of the present invention is further described. At the beginning of knitting, one of the needle beds 31 is set to knit the first surface layer 21, and the plurality of knitting needles 311 of one of the needle beds 31 knit the first surface layer 21 based on a cloth pattern setting. Then, performing the step 12 for knitting the second surface layer 22, operating another one of the needle beds 32 to knit the second surface layer 22. In the knitting process, two yarns 223 and 224 are fed into another one of the needle beds 32. One of the yarns 223 is knitted into the bottom yarn texture 221 by the plurality of knitting needles 321, and another one of the yarns 224 is connected with the bottom yarn texture 221 under the action of the plurality of knitting needles 321 and then to be hooked and hung the yarn. That is, another one of the yarns 224 is hooked by one of the hooking needles 323 and hung onto one of the sinkers 322 disposed corresponding to the hooking needles 323, thus forming one of the plurality of loops 225 as foregoing-mentioned. Later, another one of the needle beds 32 drives one of the plurality of trimmers 324 to cut the loops 225 hung on the sinkers 322, so as to form one of the plurality of cut-pile fabrics 222 connected to the bottom yarn texture 221. Further, the length of the plurality of cut-pile fabrics 222 is determined by a yarn hooking length of one of the plurality of hooking needles 323 when the plurality of loops 225 are formed. On the other aspect, the yarn 224 used for forming the plurality of loops 225 is a wool yarn. After completion of knitting the second surface layer 22, the interweaving step 13 is performed. In this step, driving the two needle beds 31 and 32 of the circular knitting machine 30 simultaneously to allow the plurality of connecting yarns 23 to connect the first surface layer 21 with the second surface layer 22 in a half stitched interweaving or a full stitched interweaving manner, as shown in Fig. 2.

[0016] Further, in addition to the foregoing embodiment of the method 10 of the present invention, another embodiment is provided. Referring to Fig. 4, in the present embodiment, the method 40 includes:

a second surface layer knitting step 41: operating one of the needle beds 32 to knit a bottom yarn tex-

ture 221 and a plurality of loops 225 connected to the bottom yarn texture 221, driving the plurality of trimmers 324 disposed on the needle bed 32 which knits the bottom yarn texture and the plurality of loops to cut the plurality of loops 225 so that the plurality of cut-pile fabrics 222 are formed and respectively connected to the bottom yarn texture 221, and constituting of the second surface layer 22 by the plurality of cut-pile fabrics 222 and the bottom yarn texture 221;

a first surface layer knitting step 42: operating another one of the needle beds 31 to knit the first surface layer 21; and

an interweaving step 43: operating the two needle beds 31 and 32 simultaneously, and connecting the first surface layer 21 with the second surface layer 22 by the plurality of connecting yarns 23, so as to knit the double-sided cloth 20 comprising cut-pile fabrics.

[0017] According to the above, the difference between the method 40 disclosed by the present embodiment and the method 10 disclosed by the previous embodiment is that the knitting sequence of the first surface layer 21 and the second surface layer 22. of the person having an ordinary skill in the art can implement the methods according to the foregoing clear disclosure, so the description of the present embodiment is not repeated herein.

[0018] Based on the above-mentioned content, the method 10 (or 40) of the present invention allows the double-sided cloth 20 comprising the cut-pile fabrics to be directly knitted by the circular knitting machine 30, which solves the problem of a complicated production procedure derived from a conventional manufacturing mode. In addition, the two cloth layers of the double-sided cloth 20 comprising cut-pile fabrics of the present invention are bonded without glue, so as to avoid danger of glue residues to the human health.

Claims

1. A method (10) for knitting a double-sided cloth comprising cut-pile fabrics with a circular knitting machine, wherein the double-sided cloth (20) comprising the cut-pile fabrics (222) is composed of a first surface layer (21) and a second surface layer (22) connected with the first surface layer (21); a plurality of cut-pile fabrics (222) are formed on one side of the second surface layer (22) relative to the first surface layer (21), the circular knitting machine (30) comprises two needle beds (31, 32) disposed corresponding to each other, and the method (10) comprises:

a first surface layer knitting step (11): operating by one of the needle beds (31) to knit the first surface layer (21);

a second surface layer knitting step (12): operating another one of the needle beds (32) to knit a bottom yarn texture (221) and a plurality of loops (225) connected to the bottom yarn texture (221), and driving a plurality of trimmers (324) disposed on the needle bed (32) which knits the bottom yarn texture (221) and the plurality of loops (225) to cut the plurality of loops (225) to form the plurality of cut-pile fabrics (222) respectively connected to the bottom yarn texture (221), and constituting of the second surface layer (22) by the plurality of cut-pile fabrics (222) and the bottom yarn texture (221); and an interweaving step (13): operating the two needle beds (31, 32) simultaneously, and connecting the first surface layer (21) with the second surface layer (22) by a plurality of connecting yarns (23), so as to knit the double-sided cloth (20) comprising the cut-pile fabrics.

2. The method (10) for knitting the double-sided cloth comprising cut-pile fabrics with the circular knitting machine according to claim 1, wherein in the step (12) for knitting the second surface layer, two yarns (223, 224) are fed into one of the needle beds (32) in the knitting process; and one of the two yarns (223, 224) is knitted into the bottom yarn texture (221), and the another one of the yarns (223, 224) is connected with the bottom yarn texture (221) and is hooked and hung the yarn to form one of the plurality of loops (225).
3. The method (10) for knitting the double-sided cloth comprising cut-pile fabrics with the circular knitting machine according to claims 1 or 2, wherein one of the yarns (224) forming the plurality of loops (225) is a wool yarn.
4. A method (40) for knitting a double-sided cloth comprising cut-pile fabrics with a circular knitting machine, wherein the double-sided cloth (20) comprising cut-pile fabrics (222) is composed of a first surface layer (21) and a second surface layer (22) connected with the first surface layer (21); a plurality of cut-pile fabrics (222) are formed on one side of the second surface layer (22) relative to the first surface layer (21); the circular knitting machine (30) comprises two needle beds (31, 32) disposed corresponding to each other, and the method (40) comprises:

a second surface layer knitting step (41) : operating one of the needle beds (32) to knit a bottom yarn texture (221) and a plurality of loops (225) connected to the bottom yarn texture (221), driving a plurality of trimmers (324) disposed on the needle bed (32) which knits the bottom yarn texture (221) and the plurality of loops (225) to cut the plurality of loops (225) to form the plurality

of cut-pile fabrics (222) respectively connected to the bottom yarn texture (221), and constituting of the second surface layer (22) by the plurality of cut-pile fabrics (222) and the bottom yarn texture (221);

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a first surface layer knitting step (42): operating another one of the needle beds (31) to knit the first surface layer (21) ; and

an interweaving step (43): operating the two needle beds (31) simultaneously, and connecting the first surface layer (21) with the second surface layer (22) by a plurality of connecting yarns (23), so as to knit the double-sided cloth (20) comprising cut-pile fabrics.

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5. The method (40) for knitting the double-sided cloth comprising cut-pile fabrics with the circular knitting machine according to claim 4, wherein in the step (42) for knitting the second surface layer, two yarns (223, 224) are fed into one of the needle beds (32) in the knitting process, and one of the two yarns (223, 224) is knitted into the bottom yarn texture (221), and another one of the yarns (223, 224) is connected with the bottom yarn texture (221) and is hooked and hung to form one of the plurality of loops (225).

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6. The method (40) for knitting the double-sided cloth comprising cut-pile fabrics with the circular knitting machine according to claims 4 or 5, wherein one of the yarns (224) forming the plurality of loops (225) is a wool yarn.

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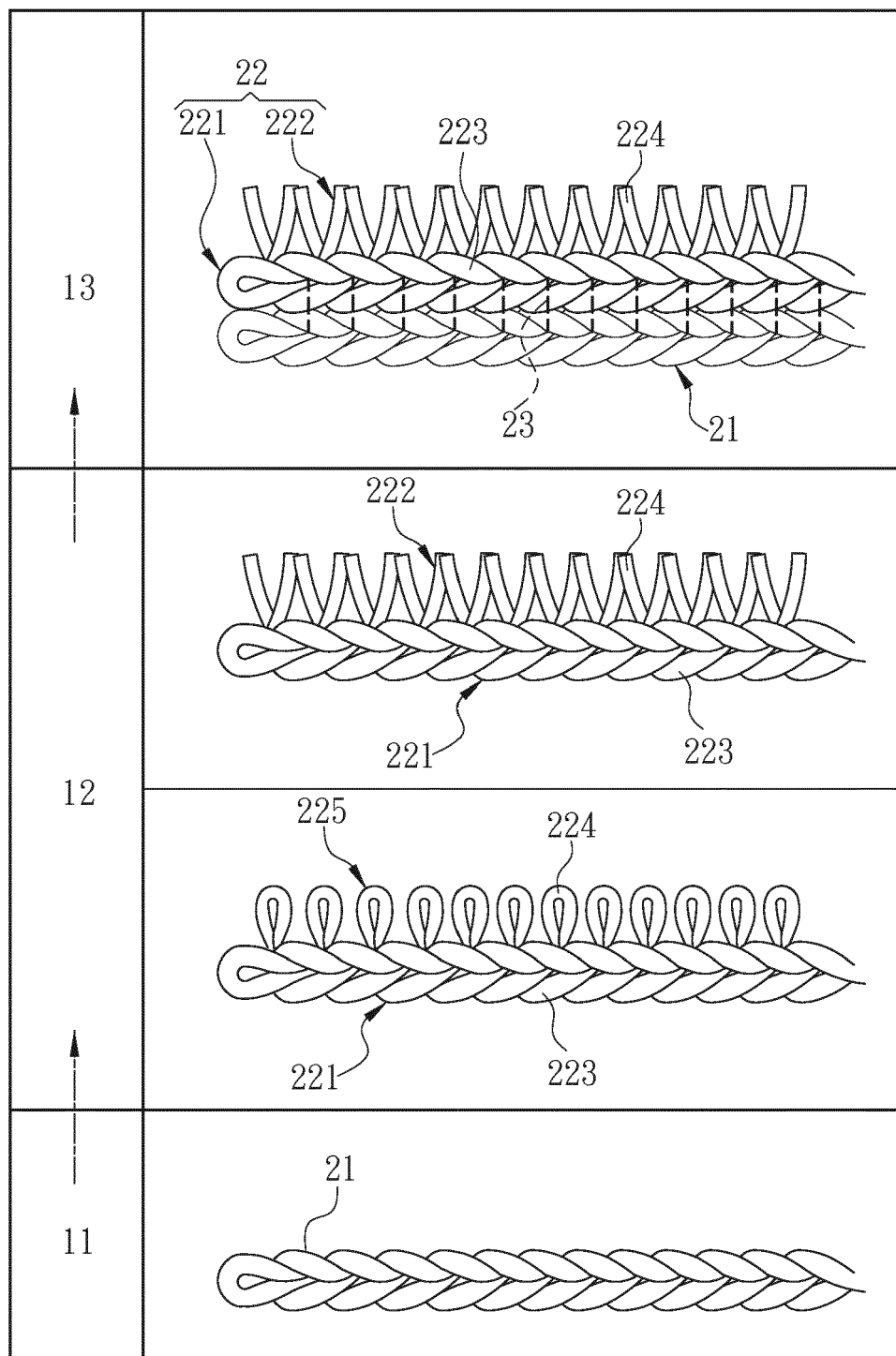


Fig. 1

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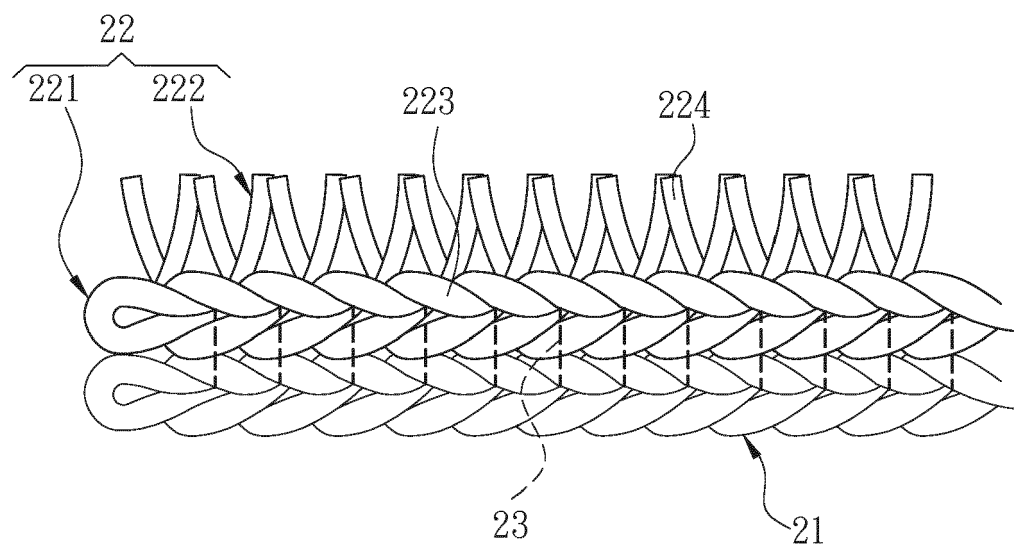


Fig. 2

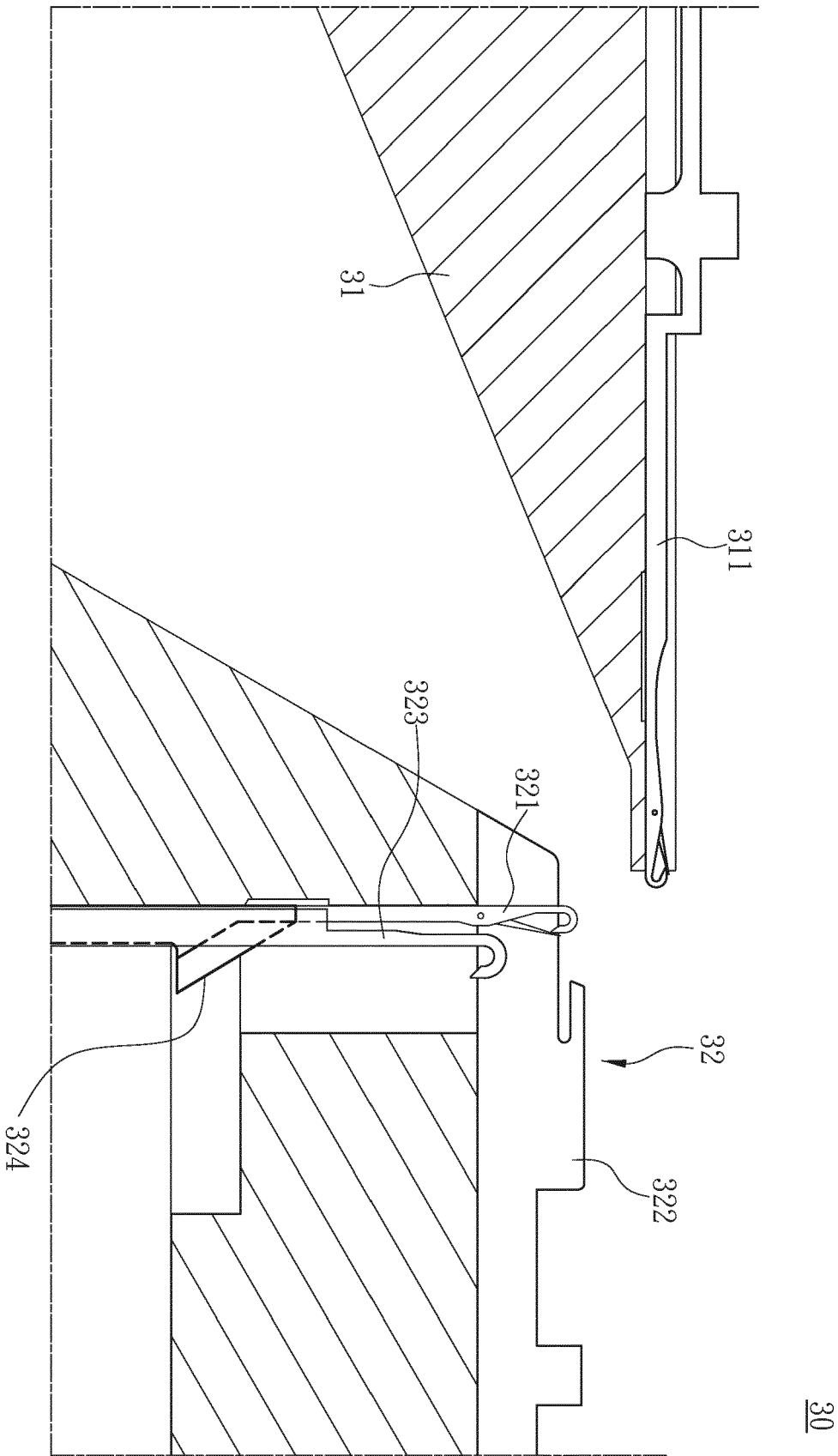


Fig. 3

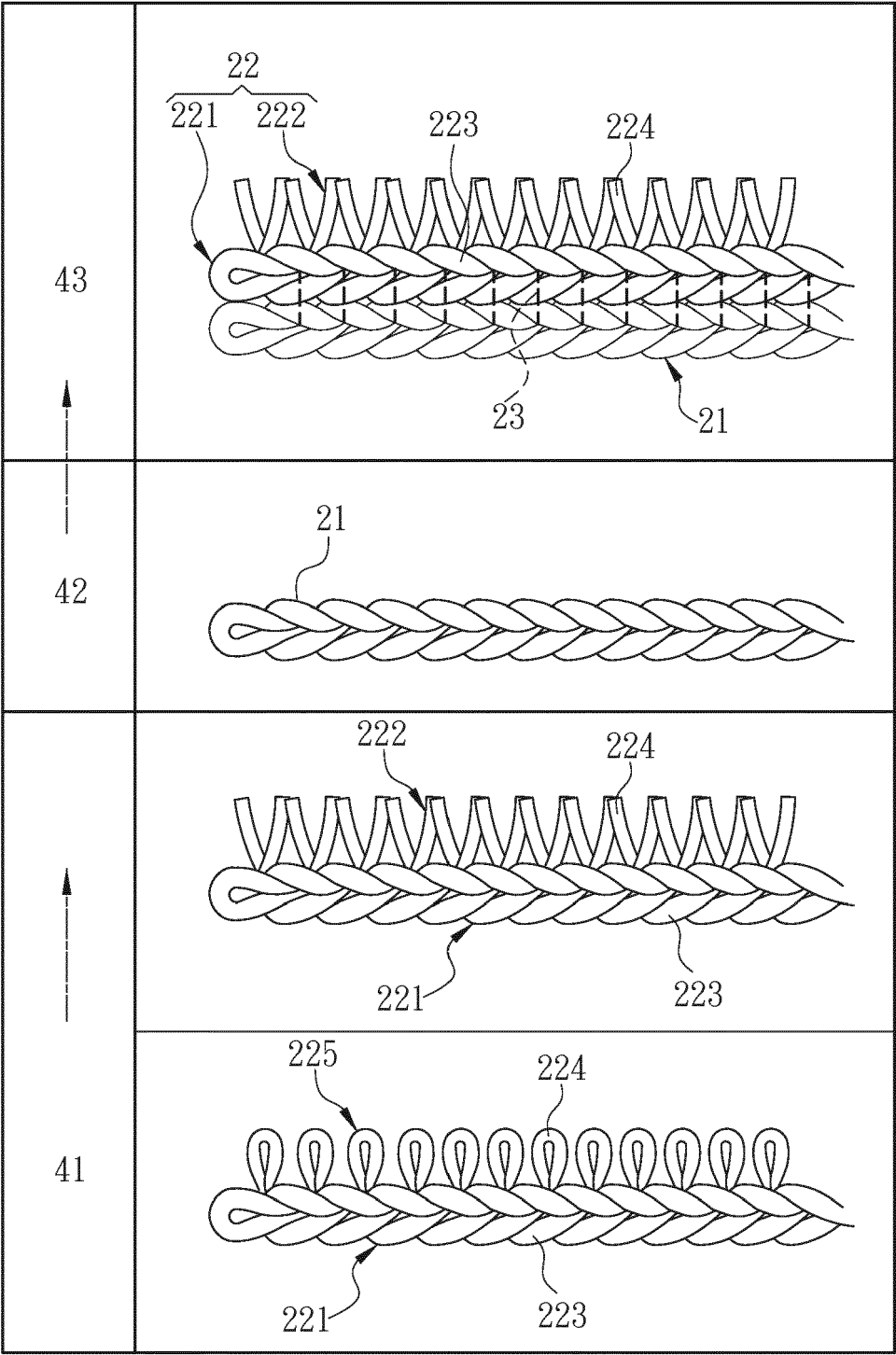


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 19 16 7584

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X	WO 2015/163587 A1 (SONG YOU CHUL [KR]) 29 October 2015 (2015-10-29)	1-6	INV. D04B1/02
Y	* paragraph [0032] - paragraph [0063]; figures 4-16 *	1-6	
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			D04B
Place of search		Date of completion of the search	Examiner
Munich		13 September 2019	Braun, Stefanie
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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