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(54) **WEFT-KNITTED FABRIC AND KNITTING METHOD THEREOF**

(57) A weft-knitted fabric (20) and a knitting method thereof. The weft-knitted fabric (20) is produced by knitting with a circular knitting machine. The weft-knitted fabric is formed by knitting a face yarn (30) and a ground yarn (31). The weft-knitted fabric (20) includes at least one first area (21) and at least one second area (22), the at least one first area (21) and the at least one second area (22) respectively comprise at least one course (23). In the first area (21), the face yarn (30) and the ground yarn (31) are all looped, and relative positions of the face yarn (30) and the ground yarn (31) are not fixed in the same course (23). In the second area (22), the ground yarn (31) is all looped, and the face yarn (30) cooperates with the ground yarn (31) by one of following: looping and welting.

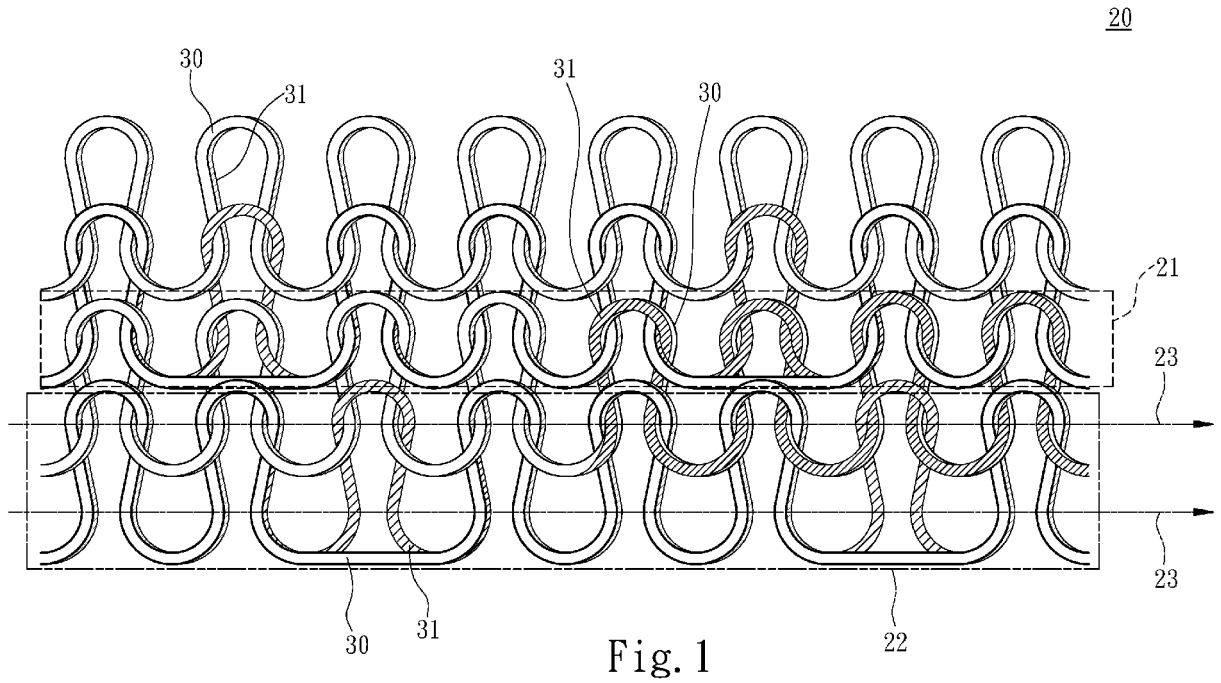

Fig. 1

EP 4 403 684 A1

Description

FIELD OF THE INVENTION

[0001] The invention relates to a weft-knitted fabric and a knitting method thereof, and more particularly to a weft-knitted fabric with both mesh and yarn-dyed jacquard and a knitting method thereof.

BACKGROUND OF THE INVENTION

[0002] If existing weft-knitted fabrics intend to change the surface color of the fabric with a mesh structure, it can only be implemented through dyeing after knitting, and cannot be realized by yarn-dyeing. Similarly, the existing weft-knitted fabrics with yarn-dyed jacquard also do not have a mesh structure, so the applicant of the invention earnestly comes up with a technical solution to solve the aforementioned problems.

SUMMARY OF THE INVENTION

[0003] A main object of the invention is to solve the problem that existing weft-knitted fabrics with mesh structure cannot have yarn-dyed jacquard.

[0004] In order to achieve the above object, the invention provides a weft-knitted fabric, produced by a circular knitting machine and formed by knitting a face yarn and a ground yarn, including at least one first area and at least one second area. The at least one first area and the at least one second area respectively comprise at least one course, in the first area, the face yarn and the ground yarn are all looped, relative positions of the face yarn and the ground yarn are not fixed in the same course, and in the second area, the ground yarn is all looped, and the face yarn cooperates with the ground yarn by one of following: looping and welting.

[0005] In one embodiment, the weft-knitted fabric comprises a plurality of first areas and a plurality of second areas, and the plurality of first areas and the plurality of second areas are alternately arranged.

[0006] In one embodiment, in each of the plurality of second areas, the face yarn is looped with the ground yarn before and after the face yarn which is welted.

[0007] In one embodiment, a color of the face yarn is different from a color of the ground yarn.

[0008] In addition to the above, the invention further provides a knitting method of a weft-knitted fabric, implemented with a circular knitting machine, the circular knitting machine using a face yarn and a ground yarn to knit, comprising:

controlling the circular knitting machine to selectively feed the face yarn and the ground yarn in one of following during knitting in a same course: normal yarn feeding and reverse yarn feeding, so that relative positions of the face yarn and the ground yarn being not fixed in the same course after being knitted into loops; and

controlling the circular knitting machine to select needles in knitting of the same course so that the ground yarn being all looped, and the face yarn cooperating with the ground yarn by one of following: knitted into loops and welted by missing needle.

[0009] In one embodiment, the face yarn is knitted into loops with the ground yarn before and after the face yarn which is welted by missing needle..

[0010] In one embodiment, a color of the face yarn is different from a color of the ground yarn.

[0011] Through the foregoing implementation of the invention, compared with the prior art, the invention has the following features: the weft-knitted fabric of the invention has mesh and yarn-dyed jacquard at the same time.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

FIG. 1 is a structural schematic diagram of a weft-knitted fabric of the invention.

FIG. 2 is a schematic diagram of areas distribution of the weft-knitted fabric of the invention.

FIG. 3 is a schematic diagram of knitting programming of the weft-knitted fabric of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] The detailed description and technical content of the invention are described below with reference to the accompanying drawings.

[0014] Please refer to FIG. 1, the invention provides a weft-knitted fabric 20, the weft-knitted fabric 20 is produced by using a circular knitting machine (not shown in the figure), and the weft-knitted fabric 20 is formed by knitting a face yarn 30 and a ground yarn 31. In one embodiment, a color of the face yarn 30 is different from a color of the ground yarn 31. Viewing a front part of the weft-knitted fabric 20, the weft-knitted fabric 20 comprises at least one first area 21 and at least one second area 22. The at least one first area 21 and the at least one second area 22 respectively comprise at least one course 23. A number of the at least one course 23 comprised in the first area 21 is not limited to be equal to a number of the at least one course 23 comprised in the second area 22. Sizes of the first area 21 and the second area 22 can be adjusted according to design requirements.

[0015] In the first area 21 of the weft-knitted fabric 20 of the invention, the face yarn 30 and the ground yarn 31 are all looped, and relative positions of the face yarn 30 and the ground yarn 31 are not fixed in the same course 23. Therefore, in the first area 21 of the weft-knitted fabric 20 of the invention, the face yarn 30 is not absolutely positioned on one side of the weft-knitted fabric 20, but

has a position exchanged with the ground yarn 31, so that a color development of the weft-knitted fabric 20 in the first area 21 is not simply caused by the face yarn 30. On the other hand, in the second area 22 of the weft-knitted fabric 20 of the invention, the ground yarn 31 is all looped, and the face yarn 30 cooperates with the ground yarn 31 by one of following: looping and welting. Further, looping of the face yarn 30 means that the face yarn 30 and the ground yarn 31 are hooked by at least one knitting needle to form a yarn loop at the same time. Welting of the face yarn 30 refers to implementation of missing needle, the face yarn 30 does not form the yarn loop together with the ground yarn 31 at that moment, so that a mesh is formed on a surface of the weft-knitted fabric 20. Further, the face yarn 30 before and after welting of the face yarn 30 are looped with the ground yarn 31. Thereby, ventilation effect of the weft-knitted fabric 20 in the second area 22 can be enhanced due to formation of the mesh.

[0016] Please refer to FIG. 2, the weft-knitted fabric 20 of the invention comprises a plurality of first areas 21 and a plurality of second areas 22, and the first areas 21 and the second areas 22 are alternately arranged. Further, a size of each of the first areas 21 is not limited to be the same, a size of each of the second areas 22 is not limited to be the same as a size of each of the first areas 21, and a size of each of the second areas 22 is not limited to be the same.

[0017] Please refer to FIG. 1 and FIG. 3, ◦ in FIG. 3 represents knitting of the face yarn 30, ■ represents knitting of the ground yarn 31, and W represents missing needle of the face yarn 30. The invention further provides a knitting method for knitting the weft-knitted fabric 20, the knitting method is implemented with the circular knitting machine, the circular knitting machine uses the face yarn 30 and the ground yarn 31 to knit, the knitting method of the weft-knitted fabric 20 comprises:

controlling the circular knitting machine to selectively feed the face yarn 30 and the ground yarn 31 in one of following during knitting in the same course 23: normal yarn feeding and reverse yarn feeding, so that relative positions of the face yarn 30 and the ground yarn 31 being not fixed in the same course 23 after being knitted into loops (as shown in row 41 of FIG. 3); and

controlling the circular knitting machine to select needles in knitting of the same course 23 so that the ground yarn 31 being all looped, and the face yarn 30 cooperating with the ground yarn 31 by one of following: knitted into loops and welted by missing needle (as shown in row 42 of FIG. 3).

[0018] The two actions described above in the knitting method are respectively used to form the first area 21 and the second area 22 of the weft-knitted fabric 20 of the invention, and switching timepoint between the two actions is limited by using the circular knitting machine to complete one of the single course 23, that is to say, the two actions cannot be changed arbitrarily in the same course 23. Furthermore, a sequence of the aforementioned two actions is not limited, and can be determined according to programming. During knitting action of the circular knitting machine to form the first area 21, a color-changing device (such as US10,669,658, TWI672405) can be used, or movement of at least one sinker can be controlled (such as JP7089126), or by controlling a retracting time of the at least one knitting needle (such as US11,136,698) to realize normal yarn feeding and reverse yarn feeding. On the other hand, during knitting action of the circular knitting machine to form the second area 22, a needle selector (not shown in the figures) can be used to control components used for knitting so that the face yarn 30 is capable of participating in knitting or missing needle, and then cooperating with the ground yarn 31 to form a loop, or producing welting relative to the ground yarn 31.

Claims

1. A weft-knitted fabric (20), produced by a circular knitting machine and formed by knitting a face yarn (30) and a ground yarn (31), comprising:
at least one first area (21) and at least one second area (22), wherein the at least one first area (21) and the at least one second area (22) respectively comprise at least one course (23), in the first area (21), the face yarn (30) and the ground yarn (31) are all looped, relative positions of the face yarn (30) and the ground yarn (31) are not fixed in the same course (23), and in the second area (22), the ground yarn (31) is all looped, and the face yarn (30) cooperates with the ground yarn (31) by one of following: looping and welting.

2. The weft-knitted fabric (20) as claimed in claim 1, wherein the weft-knitted fabric (20) comprises a plurality of first areas (21) and a plurality of second areas (22), and the plurality of first areas (21) and the plurality of second areas (22) are alternately arranged.

3. The weft-knitted fabric (20) as claimed in claim 1 or claim 2, wherein in each of the plurality of second areas (22), the face yarn (30) is looped with the ground yarn (31) before and after the face yarn (30) which is welted.

4. The weft-knitted fabric (20) as claimed in claim 3, wherein a color of the face yarn (30) is different from a color of the ground yarn (31).

5. The weft-knitted fabric as claimed in claim 1, wherein a color of the face yarn (30) is different from a color of the ground yarn (31).

6. A knitting method of a weft-knitted fabric (20), implemented with a circular knitting machine, the circular knitting machine using a face yarn (30) and a ground yarn (31) to knit, comprising:

controlling the circular knitting machine to selectively feed the face yarn (30) and the ground yarn (31) in one of following during knitting in a same course (23): normal yarn feeding and reverse yarn feeding, so that relative positions of the face yarn (30) and the ground yarn (31) being not fixed in the same course (23) after being knitted into loops; and
controlling the circular knitting machine to select needles in knitting of the same course (23) so that the ground yarn (31) being all looped, and the face yarn (30) cooperating with the ground yarn (31) by one of following: knitted into loops and welted by missing needle.

7. The knitting method of the weft-knitted fabric (20) as claimed in claim 6, wherein the face yarn (30) is knitted into loops with the ground yarn (31) before and after the face yarn (30) which is welted by missing needle.

8. The knitting method of the weft-knitted fabric (20) as claimed in claim 6, wherein a color of the face yarn (30) is different from a color of the ground yarn (31).

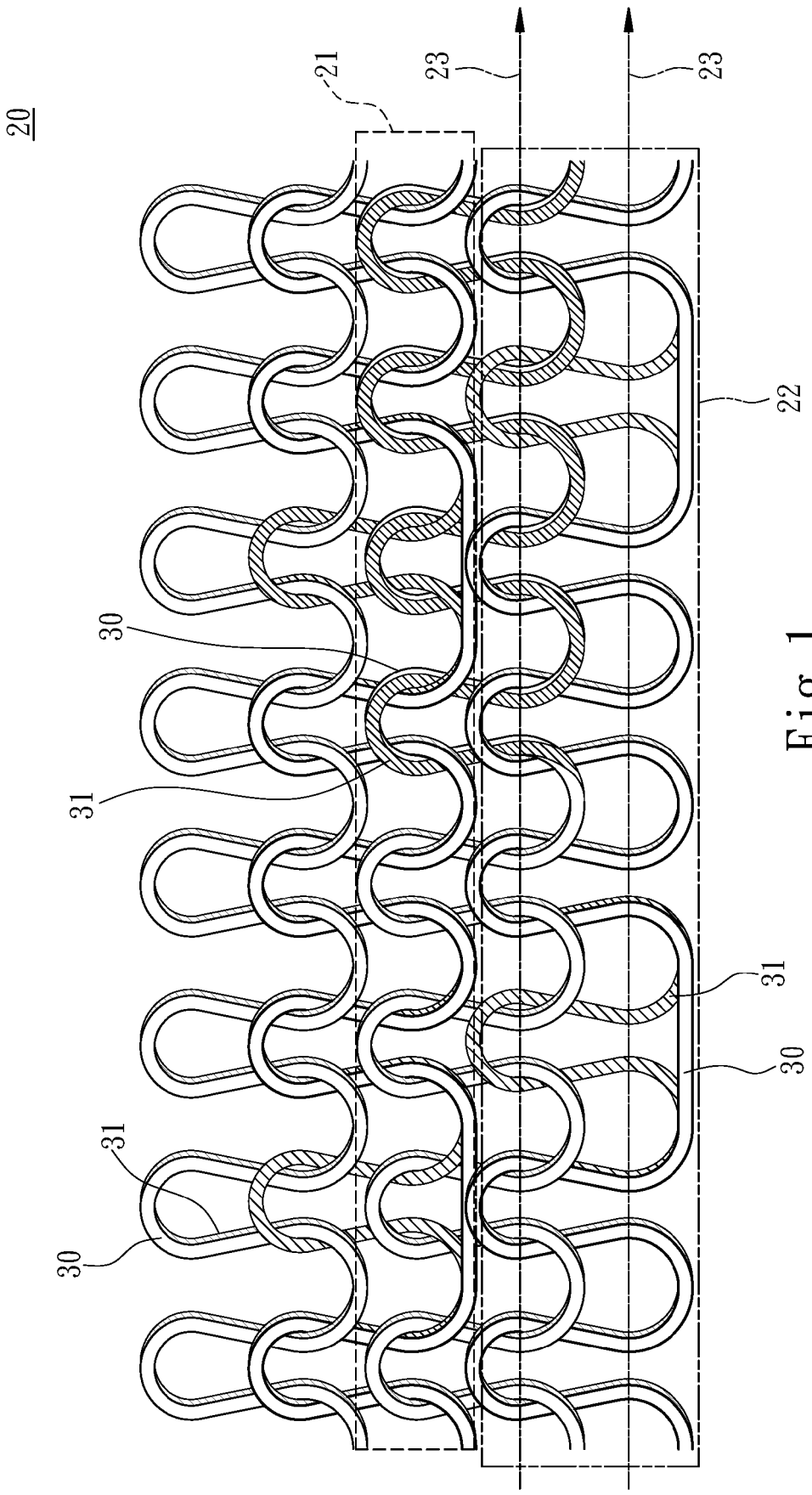

Fig. 1

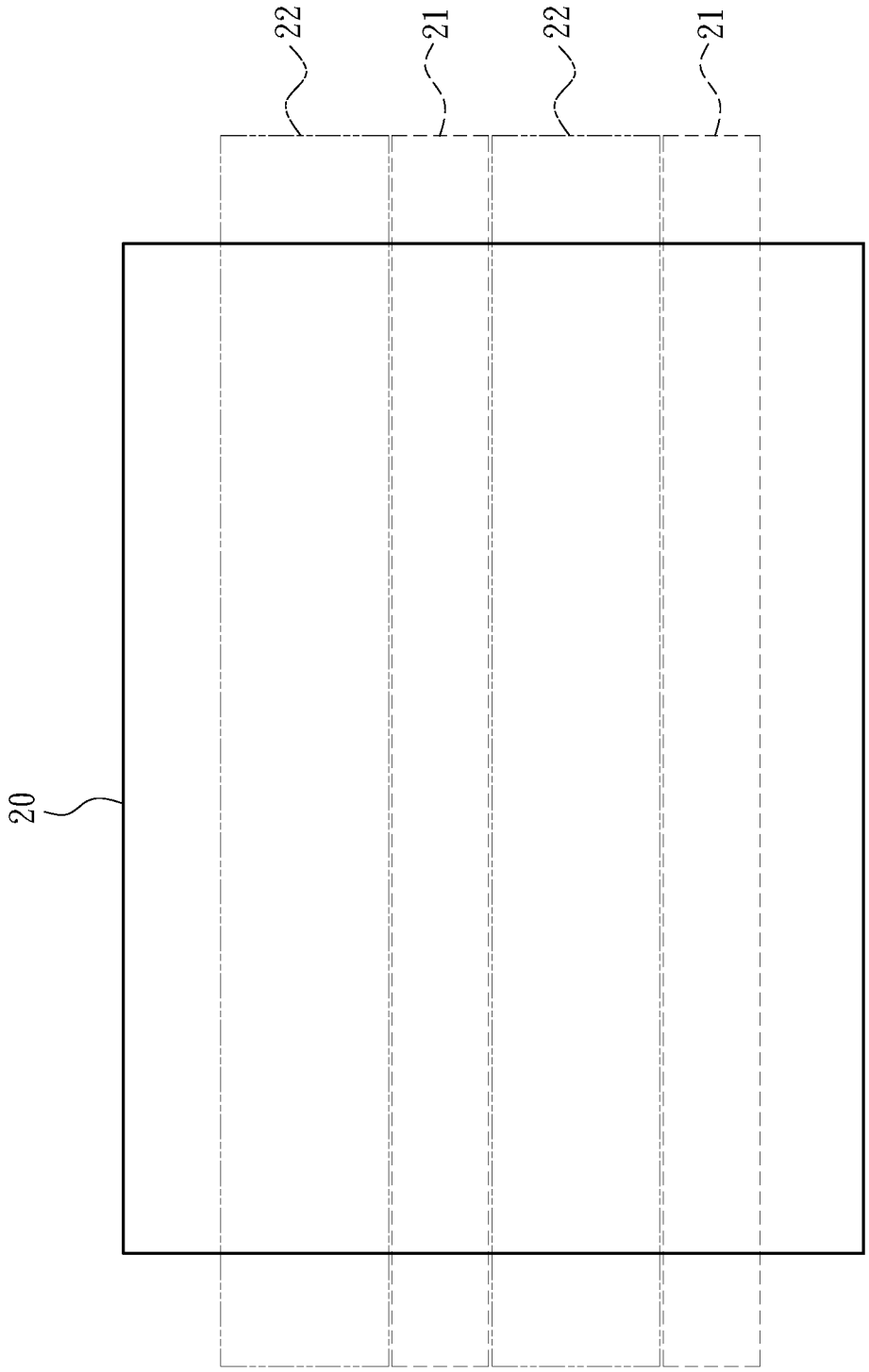

Fig. 2

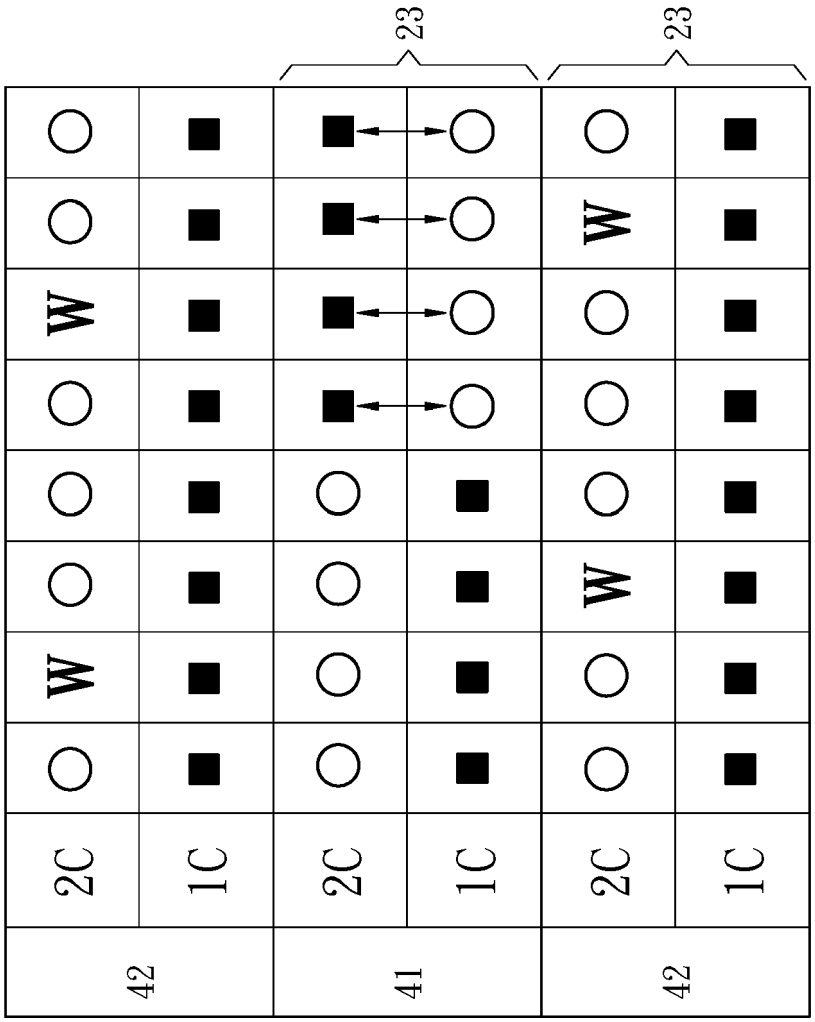

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 23 15 2248

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 1 838 994 A (HOUSEMAN WILBUR L) 29 December 1931 (1931-12-29) * page 1, lines 45-53; figures 3, 4 * * page 2, lines 5-50 * * page 3, lines 13-21 *	1-8 2-4,7	INV. D04B1/10 D04B1/12
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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	10 July 2023	Kirner, Katharina

CATEGORY OF CITED DOCUMENTS

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10-07-2023

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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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