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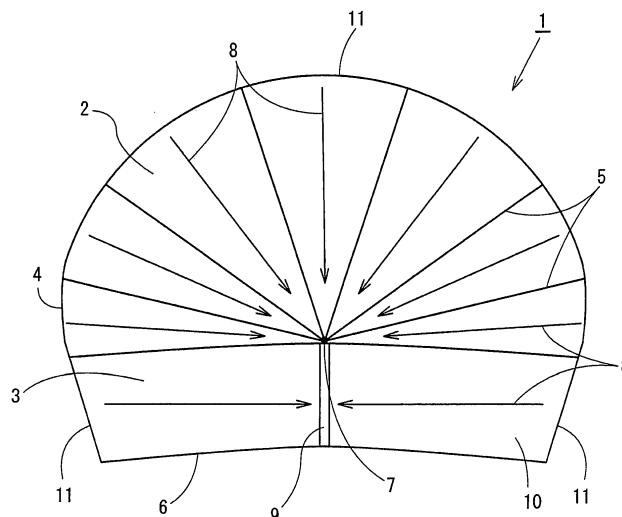
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(54) **KNITTED FABRIC HAVING AN ARCUATE KNITTED PORTION IN AT LEAST A PART OF ITS PERIPHERAL EDGE PORTION, AND ITS KNITTING METHOD**

(57) A knitted fabric having a smoother curved peripheral edge portion and a method of knitting the same are provided. A method for knitting a knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion thereof, the knitted fabric being knitted with a weft knitting machine having at least a pair of front and rear needle beds, in which a set-up portion common to

front and rear knitted fabrics is formed and the front and rear knitted fabrics are knitted from the set-up portion with respective yarn carriers, an arcuate set-up portion is formed by reducing and gathering width of the knitted fabric at a plurality of areas of the knitting width of the knitted fabric and the front and rear knitted fabrics are joined to each other so that both side edge portions of the knitted fabric form an opening of the knitted fabric.

Fig. 1



Description

Technical Field

[0001] The present invention relates to a knitted fabric knitted with a weft knitting machine and a method for knitting the same. More particularly, the invention relates to a knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion thereof and a method for knitting the same.

Background Art

[0002] An exemplary known knitted fabric having an arcuate knitted portion at least partially in a peripheral edge thereof and knitted with a weft knitting machine is a pouch-shaped knitted fabric, such as a knit hat. Such a pouch-shaped knitted fabric is knitted, as illustrated in Fig. 7, by setting up from a lower opening 101 and continuing knitting along the directions of arrows 104. In this manner, a knitted fabric 100 having a parachute pattern is provided in which lines 102 connecting junction points of overlapping adjacent loops gather to a top 103. The knitted fabric having a parachute pattern includes a conical-shaped knitted portion along the lines 102 connecting the junction points.

[0003] An exemplary knitted fabric in which at least a portion thereof has a parachute pattern is disclosed in Patent Document 1 described below. In the disclosed knitted fabric, lines connecting junction points at which adjacent loops overlap each other gather to an opening for a neck along shoulder portions above side portions of the knitted fabric for a sweater to provide a front part of the sweater.

[0004]

Patent Document 1: W02002/066722

Disclosure of Invention

Problems to be Solved by the Invention

[0005] The parachute pattern disclosed in Patent Document 1 above, however, has a problem described below. Since the lines connecting the junction points gather to the opening for a neck, the lines connecting the junction points gather along a single direction to provide substantially linear peripheral edge portions of the knitted fabric. It is therefore difficult to obtain smoothly-curved peripheral edge portions of the knitted fabric.

[0006] The invention is made in view of the aforementioned related art problem and an object thereof is to provide a knitted fabric having smoothly-curved peripheral edge portions and a method for knitting the same.

Means for Solving the Problem

[0007] In order to achieve the above object, a method

for knitting a knitted fabric according to the invention having an arcuate knitted portion at least partially in a peripheral edge portion thereof, the knitted fabric being knitted with a weft knitting machine having at least a pair of front and rear needle beds, in which a set-up portion common to front and rear knitted fabrics is formed and the front and rear knitted fabrics are knitted from the set-up portion with respective yarn carriers, an arcuate set-up portion is formed by reducing and gathering a knitting width of the knitted fabric at a plurality of areas of the knitting width of the knitted fabric and the front and rear knitted fabrics are joined to each other so that both side edge portions of the knitted fabric form an opening of the knitted fabric.

[0008] A knitted fabric according to the invention having an arcuate knitted portion at least partially in a peripheral edge portion thereof, the knitted fabric being knitted with a weft knitting machine having at least a pair of front and rear needle beds, in which the peripheral edge portion, which is arcuate, is knitted with knitting yarns respectively fed to knitting needles of the front and rear needle beds and an arcuate knitted portion is formed by reducing a knitted fabric width from an arcuate-shaped portion and gathering wales at a plurality of areas of the knitting width.

[0009] In the knitted fabric having a configuration described above, a knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion thereof, which is a pouch-shaped knitted fabric has a peripheral edge portion, which is arcuate, forming a bottom of a bag and both side edge portions of the knitted fabric forming an opening of the knitted fabric.

[0010] In the knitted fabric described above, the knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion has an opening formed by both side edge portions of a strap-shaped knitted fabric.

Advantages

[0011] According to a method for knitting a knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion according to the invention, a set-up portion common to front and rear knitted fabrics is formed and the front and rear knitted fabrics are knitted from the set-up portion with respective yarn carriers, an arcuate set-up portion is formed by reducing and gathering width of the knitted fabric at a plurality of areas of the knitting width of the knitted fabric and the front and rear knitted fabrics are joined to each other so that both side edge portions of the knitted fabric form an opening of the knitted fabric. With this configuration, a knitted fabric having a smoothly-curved arcuate peripheral edge portion can be knitted easily.

[0012] In a knitted fabric according to the invention, the peripheral edge portion, which is arcuate, is knitted with knitting yarns respectively fed to knitting needles of the front and rear needle beds and an arcuate knitted portion is formed by reducing the knitted fabric width and gathering wales at a plurality of areas of the knitting width from an arcuate-shaped portion. With this configuration,

a knitted fabric having a smooth arcuate peripheral edge portion can be provided.

[0013] A pouch-shaped knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion, in which the arcuate peripheral edge portion forms a bottom of a bag and both side edge portions form an opening of the knitted fabric, may be employed for a hat or a bag to advantageously provide a novel and unique product having a smooth arcuate peripheral edge.

[0014] A pouch-shaped knitted fabric having the arcuate knitted portion at least partially in the peripheral edge portion, in which an opening is formed by a strap-shaped side edge portion formed at both sides of the knitted fabric, may provide a knitted fabric with an opening designed to be reinforced with the strap-shaped knitted fabric. Such a knitted fabric has an advantageous aesthetic design and an advantageous effect that the depth of the pouch-shaped knitted fabric can be changed only by changing the width of the strap-shaped portion.

Brief Description of Drawings

[0015]

[Fig. 1] Fig. 1 is a side view of a knitted fabric according to an embodiment of the invention.

[Fig. 2] Fig. 2 is an expansion plan view of the knitted fabric.

[Fig. 3] Fig. 3 is an elevational view of a knitted fabric according to another embodiment of the invention.

[Fig. 4] Fig. 4 is an elevational view of a knitted fabric according to still another embodiment of the invention.

[Fig. 5] Fig. 5 is an elevational view of a knitted fabric according to further embodiment of the invention.

[Fig. 6] Fig. 6 is a perspective view of a related art knitted fabric.

Reference Numerals

[0016]

- 4 peripheral edge portion
- 6 opening
- 11 set-up portion

Best Modes for Carrying Out the Invention

[0017] Hereinafter, the most preferred embodiment of a knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion and a method for knitting the same will be described with reference to the drawings.

First Embodiment

[0018] Fig. 1 is a side view of a knit hat which is an embodiment of a knitted fabric having an arcuate knitted

portion at least partially in a peripheral edge portion according to the invention. In the drawing, reference numeral 1 denotes an entire hat, 2 denotes a pouch-shaped knitted portion, 3 denotes a strap-shaped knitted portion, 4 denotes a peripheral edge portion of a pouch-shaped knitted fabric portion, 5 denotes lines connecting junction points of the pouch-shaped knitted fabric portion, 6 denotes an opening, 7 denotes a central portion of the pouch-shaped knitted portion, 8 denotes arrows illustrating knitting directions, 9 denotes a junction portion of strap-shaped knitted portions at both sides, 10 denotes a hat inlet portion and 11 denotes a set-up portion.

The hat 1 is knitted with a known weft knitting machine (not illustrated) having at least one pair of front and rear needle beds disposed so that end portions thereof are close to each other. The needle beds each house a knitting needle to be slidable back and forth.

The hat 1 is formed by the pouch-shaped knitted portion 2 and the strap-shaped knitted portion 3. The pouch-shaped knitted portion 2 has the arcuate peripheral edge portion 4 and gathers to the central portion 7 from the peripheral edge portion 4. The strap-shaped knitted portion 3 forms the inlet portion 10 and the opening 6 of the hat 1.

[0019] As illustrated in Fig. 2, the pouch-shaped knitted portion 2 and the strap-shaped knitted portion 3 are formed from a set-up portion 11 (i.e., the peripheral edge portion 4 of the pouch-shaped knitted portion 2) which is common to front and rear knitted fabrics. The set-up portion 11 common to the front and rear knitted fabrics is formed with a knitting yarn fed from a single yarn carrier (not illustrated) to the front and rear knitting needles of the needle beds.

Alternatively, the set-up portion 11 may be formed with a knitting yarn fed to a knitting needle of either of the front or rear needle bed and a loop moved toward an opposite knitting needle.

Setting-up width is calculated by adding a length of the arcuate peripheral edge portion 4 to the width of the strap-shaped knitted portion 3 of the hat 1.

As described later, Fig. 2 is one of expanded plan views of the knitted fabrics knitted from the set-up portion 11 at both the front and rear needle beds. For example, Fig. 2 is an expanded plan view of the knitted fabric knitted at the front needle bed.

[0020] Next, from the set-up portion 11, knitting yarns are fed through the knitting needles of the front and rear needle beds from the individual yarn carrier corresponding to each needle bed. Knitting width is reduced at a plurality of areas other than the strap-shaped knitted portions 3 described below located at both ends of the knitting width of each needle bed. Accordingly, a plurality of isosceles triangles having each apex gathering to a central portion A of the knitted fabric width illustrated in Fig. 2 is formed.

Conversely, the lines 5 which connect the wales and the junction points extend radially from the central portion A of the knitted fabric width.

[0021] Although a plurality of isosceles triangles having apexes gathering to the central portion A of the knitted fabric width were formed in this first embodiment, the invention is not limited to the same. Configurations other than isosceles triangles may alternatively be provided by changing the positions and numbers of the junction points. A plurality of isosceles triangles having apexes gathering to the central portion A of the knitted fabric width are not necessarily of the same configuration. Alternatively, different isosceles triangles or configurations other than isosceles triangles may be employed.

The knitting width is reduced at a plurality of areas in the following manner. As illustrated by arrows 8, stitches at a plurality of areas are made to overlap each other near the central portion A of the knitted fabric width and new stitches are formed in the knitting needle over the overlapping stitches.

[0022] In this manner, the knitting width is reduced at a plurality of areas and gathers to the central portion A of the knitted fabric width illustrated in Fig. 2, the strap-shaped knitted portions 3 are disposed to be adjacent to each other with the central portion A disposed therebetween.

The thus-disposed adjacent strap-shaped knitted portions 3 are knitted with the stitches thereof overlapping each other. Accordingly, when strap-shaped knitted portions 3 of both sides are connected at the junction portion 9, side edge portions of the strap-shaped knitted portions 3 form an opening as the inlet portion 10 of the hat 1. In this manner, the hat 1 (i.e., a pouch-shaped knitted fabric) having a smoothly-curved set-up portion 11 is provided. The inlet portion 10 of the hat 1 is formed by the side edge portions of the strap-shaped knitted portions 3 to provide a soft, flexible and beautiful knit hat 1 as compared with welt-stitched ones.

Although not illustrated, stitch patterns, such as a garter stitch and a lace stitch, may be formed in the strap-shaped knitted portions 3 to provide the hat 1 with a significantly increased design value.

Second Embodiment

[0023] Fig. 3 is an elevational view of knit pants as an exemplary knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion according to the invention. In the drawing, reference numeral 12 denotes the entire pants, 13 denotes an inlet portion of the pants, 14 denotes a knitted portion for a right leg, 15 denotes a knitted portion for a left leg and 16 denotes a knitted portion for a gusset which constitutes a portion of the pouch-shaped knitted fabric portion.

In the embodiments described below, the same components as those of the first embodiment are denoted by the same reference numerals and a detailed description thereof will be omitted.

The pants 12 is formed by the pouch-shaped knitted portion 2, the strap-shaped knitted portion 3 as described in first embodiment and the knitted portion 14 for the right

leg and the knitted portion 15 for the left leg. The pouch-shaped knitted portion 2 has the arcuate peripheral edge portion 4 and gathers toward the central portion 7 from the peripheral edge portion 4. The strap-shaped knitted portion 3 forms the inlet portion 13 and the opening 6 of the pants 12.

[0024] The pouch-shaped knitted portion 2 and the strap-shaped knitted portion 3 are knitted in the same manner as in first embodiment. The knitted portion 14 for the right leg and the knitted portion 15 are knitted with the front and rear needle beds of the weft knitting machine as individual tubular knitted fabrics continuing to the pouch-shaped knitted fabric portion 2 illustrated by a dashed dotted line B in Fig. 3.

[0025] In the pants 12 according to the second embodiment, the pouch-shaped knitted portion 2 gathering to the central portion 7 from the peripheral edge portion 4 is formed by the set-up portion 11 corresponding to the arcuate peripheral edge portion 4 of the pants 12, a knitted portion continued from the knitted portion 14 for the left leg and the knitted portion 15 for the right leg and the knitted portion 16 for the gusset.

Third Embodiment

[0026] Fig. 4 is an elevational view of a front part of a one-piece suit as exemplary knitwear, such as a vest, one-piece suit, sweater and skirt according to the invention. The knitwear is a knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion. Reference numeral 17 denotes the front part of the one-piece suit, 18 denotes a knitted portion for a collar, 19 denotes set-up portions for shoulders, 20 denotes openings for sleeves, 21 denotes a knitted portion for a body part and 22 denotes a hem of the front part of the one-piece suit.

The front part 17 of the one-piece suit includes the knitted portion 18 for the collar, the knitted portion 21 for the body part, the pouch-shaped knitted portion 2 and the strap-shaped knitted portion 3. The pouch-shaped knitted portion 2 has an arcuate peripheral edge portion 4 described in the first embodiment and gathers toward the central portion 7 from the peripheral edge portion 4. The strap-shaped knitted portion 3 forms the hem 22 and the opening 6 of the front part 17 of the one-piece suit.

[0027] The pouch-shaped knitted portion 2 and the strap-shaped knitted portion 3 of the front part 17 of the one-piece suit according to the third embodiment are knitted in the same manner as in first embodiment. The knitted portion 21 for the body part illustrated in Fig. 4 continuing to the pouch-shaped knitted fabric portion 2 illustrated by a dashed dotted line C is formed in the following manner. The tubular knitted portion 18 for the collar is knitted with the front and rear needle beds of the weft knitting machine. The set-up portions 19 for the shoulders are then set up so as to form openings for sleeves at the openings 20 for the sleeves. Alternatively, sleeves, which are not illustrated, may be joined to the openings. Finally,

the tubular body part 21 is knitted.

Fourth Embodiment

[0028] Fig. 5 is a side view of a knit bag which is an exemplary knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion according to the invention. In the drawing, reference numeral 23 denotes an entire bag and 24 denotes a handle of the bag. The bag 23 has a vertically inverted shape of the hat 1 of the first embodiment described above. The bag 23 is formed by the strap-shaped knitted portion 3 at an upper portion thereof and the pouch-shaped knitted fabric portion 2 at a lower portion thereof. The handle 24 is attached to the strap-shaped knitted portion.

The bag 23 is knitted in the same manner as in the hat 1 of the first embodiment.

[0029] In the first to fourth embodiments described above, a bottomed pouch-shaped knitted fabric has been illustrated as a knitted fabric having an arcuate knitted portion at least partially in the peripheral edge portion. The knitted fabric of the invention, however, is not limited to the same. A knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion of a tubular or a planar knitted fabric may alternatively be employed.

Although the opening 6 is formed by a strap-shaped knitted portion 3 formed at both side edge portions of the pouch-shaped knitted fabric, the invention is not limited to the same. The invention may alternatively be provided by a knitted fabric having no strap-shaped knitted portion at both side edge portions of the knitted fabric.

[0030] In the pouch-shaped knitted fabric portion 2, various patterns may be provided by additional organized patterns or color arrangements including striped patterns formed by two or more colored yarns fed from additional yarn carriers.

In the method for knitting a knitted fabric described in the first to fourth embodiments, a two-bed weft knitting machine may be employed to perform needle-extracted knitting with every other knitting needle being used. However, a four-bed weft knitting machine may be employed to perform knitting using every needle without any needle extraction.

Claims

1. A method for knitting a knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion thereof, the knitted fabric being knitted with a weft knitting machine having at least a pair of front and rear needle beds, wherein a set-up portion common to front and rear knitted fabrics is formed and the front and rear knitted fabrics are knitted from the set-up portion with respective yarn carriers, an arcuate set-up portion is formed by reducing and gathering a knitting width of the knitted fabric at a

plurality of areas of the knitting width of the knitted fabric and the front and rear knitted fabrics are joined to each other so that both side edge portions of the knitted fabric form an opening of the knitted fabric.

2. A knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion thereof, the knitted fabric being knitted with a weft knitting machine having at least a pair of front and rear needle beds, wherein the peripheral edge portion, which is arcuate, is knitted with knitting yarns respectively fed to knitting needles of the front and rear needle beds and an arcuate knitted portion is formed by reducing a knitted fabric width and gathering wales from an arcuate-shaped portion at a plurality of areas of the knitting width.
3. A knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion thereof according to claim 2, which is a pouch-shaped knitted fabric, wherein a peripheral edge portion, which is arcuate, forms a bottom of a bag and both side edge portions of the knitted fabric form an opening of the knitted fabric.
4. A knitted fabric having an arcuate knitted portion at least partially in a peripheral edge portion according to claim 3, wherein an opening is formed by both side edge portions of a strap-shaped knitted fabric.

Fig. 1

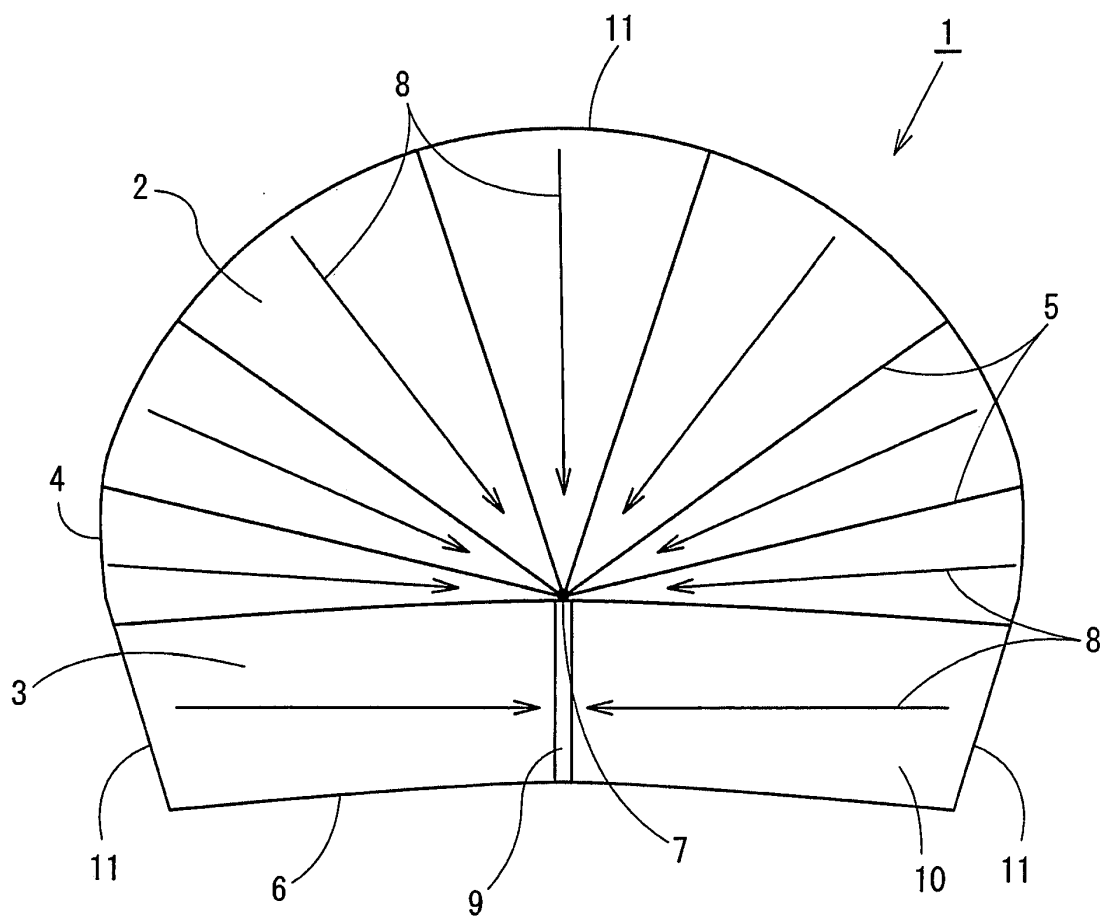


Fig. 2

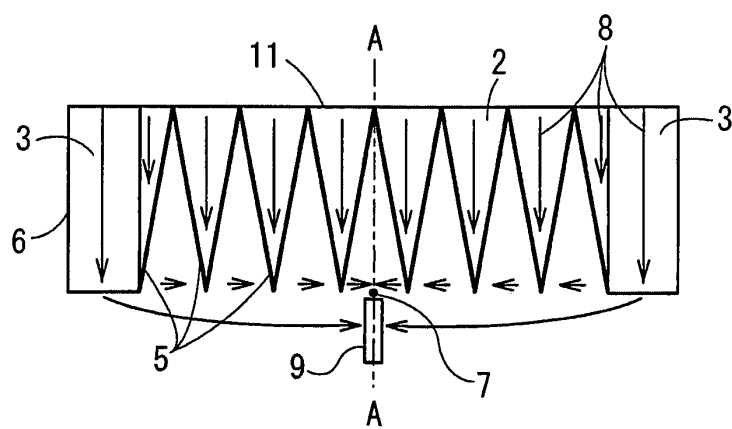


Fig. 3

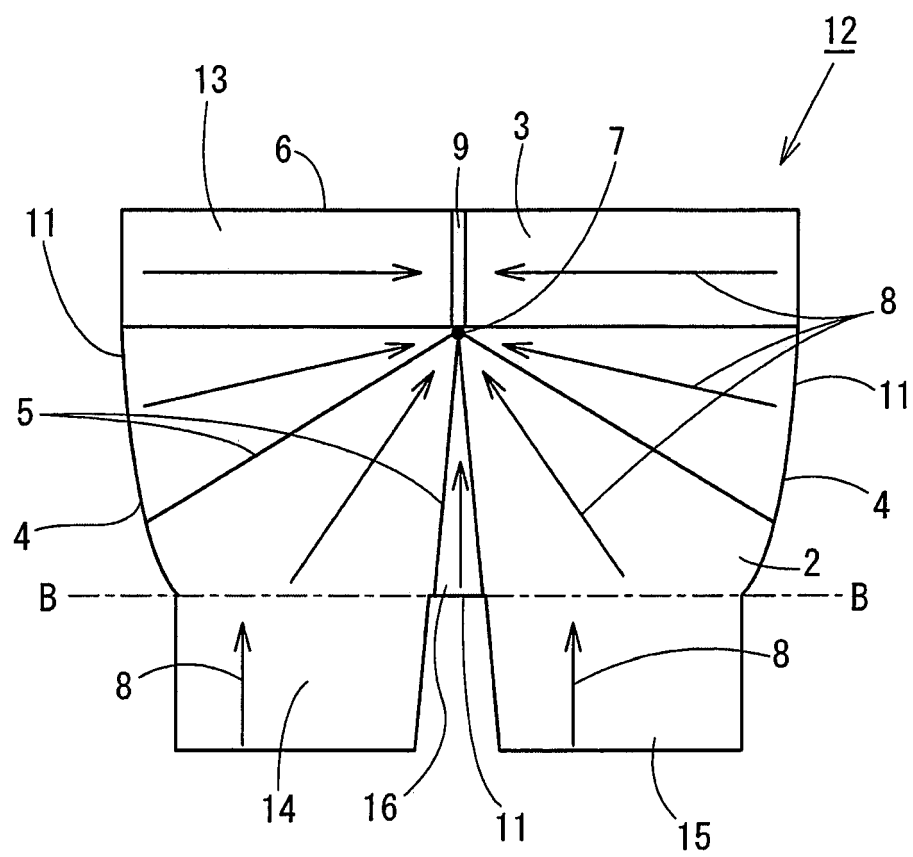


Fig. 4

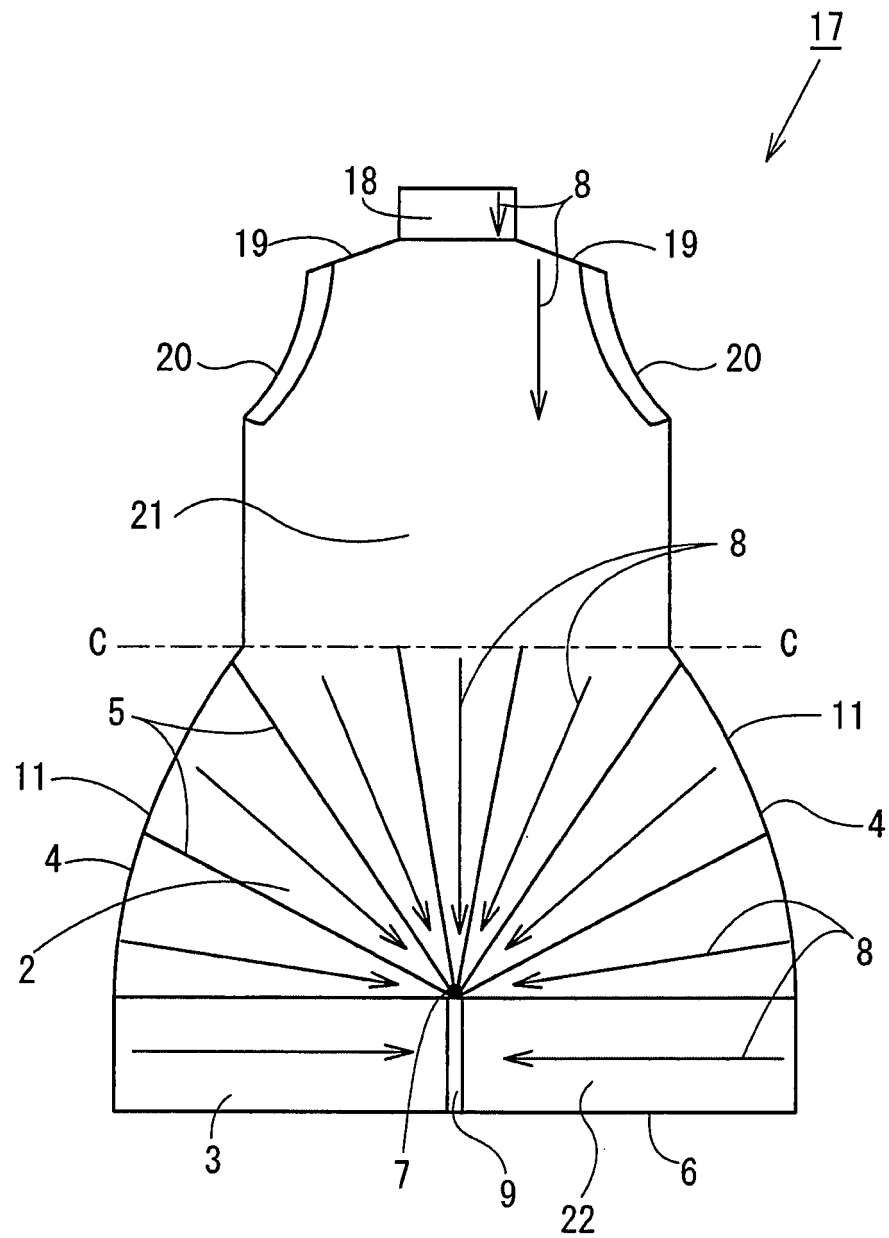


Fig. 5

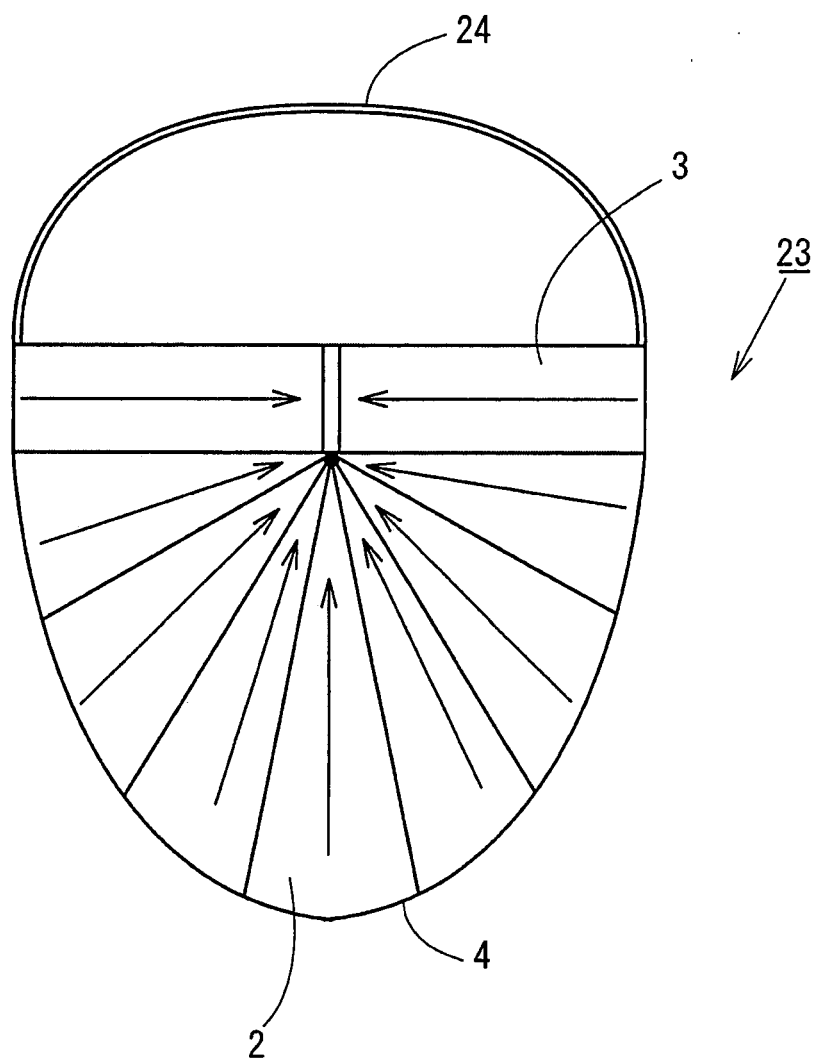
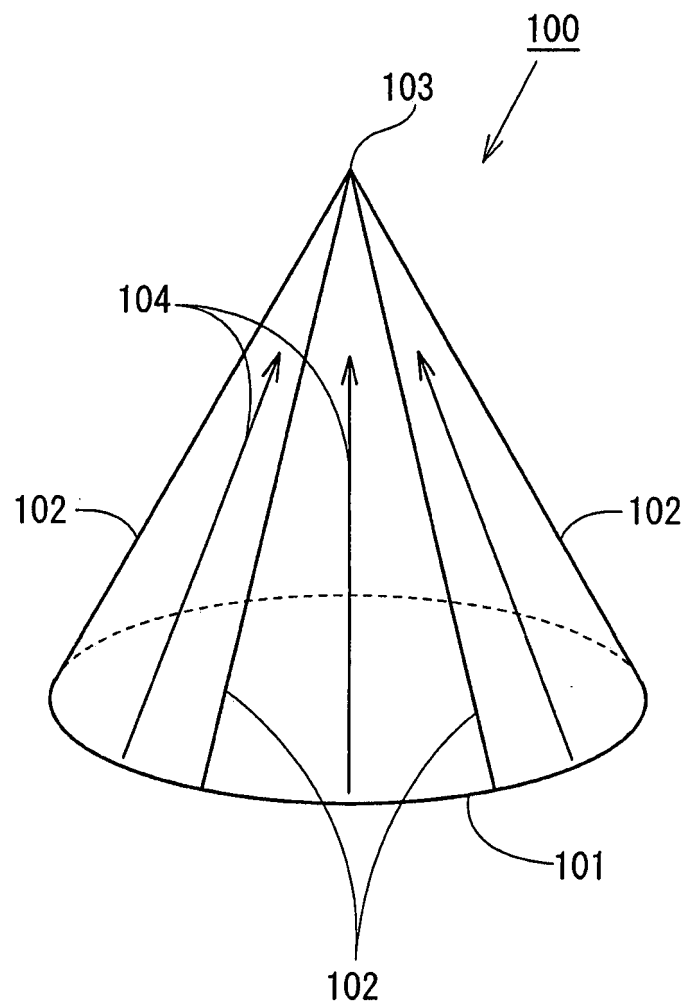


Fig. 6



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2008/063396

A. CLASSIFICATION OF SUBJECT MATTER

D04B1/24(2006.01)i, D04B7/10(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

D04B1/00-1/28, D04B21/00-21/20, D04B3/00-19/00, D04B23/00-39/08

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2008
Kokai Jitsuyo Shinan Koho	1971-2008	Toroku Jitsuyo Shinan Koho	1994-2008

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2002/66722 A1 (Shima Seiki Mfg., Ltd.), 29 August, 2002 (29.08.02), Claims 1, 3; Fig. 3 & CN 1526039 A & EP 1371767 A1 & JP 3968018 B2 & US 2004/083766 A1	1-4
A	WO 2005/116315 A1 (Shima Seiki Mfg., Ltd.), 08 December, 2005 (08.12.05), Claim 1; Par. Nos. [0016], [0027] & CN 1961106 A & EP 1757720 A1 & JP 2005-336634 A & US 2008/028800 A1	1-4
A	JP 4-214448 A (Shima Seiki Mfg., Ltd.), 05 August, 1992 (05.08.92), Claims 1, 6 & EP 0490694 A1 & US 5417088 A	1-4

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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Date of the actual completion of the international search
17 October, 2008 (17.10.08)Date of mailing of the international search report
28 October, 2008 (28.10.08)Name and mailing address of the ISA/
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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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