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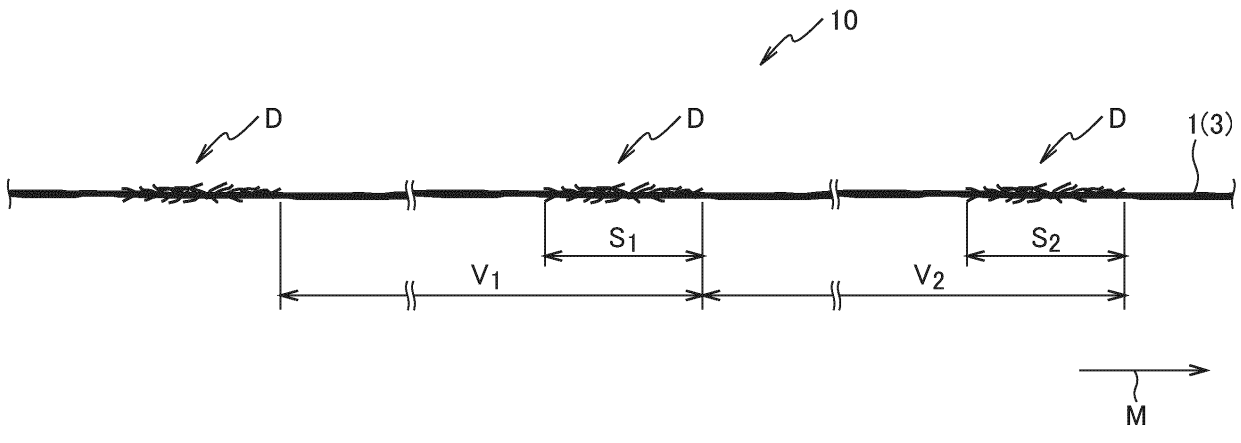
(54) **DESIGN YARN**

(57) A fancy yarn comprises: a yarn composed of a plurality of main fibers elongated in a main direction, the plurality of main fibers being false-twisted or real-twisted about the main direction; and a plurality of decorations composed of decorative fibers respectively independent of the main fibers and entangled with and raised from the plurality of main fibers, the decorations being evenly or unevenly away in the main direction from each other.

FIG. 1



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Description

TECHNICAL FIELD

[0001] The following disclosure relates to a fancy yarn constituted of a main yarn and decorative fibers interlaced with the main yarn.

BACKGROUND ART

[0002] For the purpose of causing decorative effects on fabrics or knits, or for any other purposes, changes such as slubs or loops formed at regular or irregular intervals are often given to yarns. A yarn with such changes is often referred to as a fancy yarn. A variety of fancy yarns had been proposed in the past.

[0003] As no definite production method for fancy yarns exists, one is produced by giving changes during a spinning process and another is produced by further processing a yarn once produced through a spinning process. Even in cases where once produced yarns are further processed to produce fancy yarns, the fancy yarn may be sometimes produced by processing a single yarn but may be in another case produced through a process where one yarn is interlaced with another yarn.

[0004] PTL 1 discloses a related art.

Citation List

Patent Literature

PTL 1: Japanese Patent Application Laid-open No. 2004-270124

SUMMARY

[0005] Application of fancy yarns can bring about unique decorative effects to fabrics or knits, which is hardly obtained by any improvement in dyeing or sewing. These decorative effects are dependent on and typical of production methods for fancy yarns. Specifically, development of a new production method for a fancy yarn necessarily links up with emergence of a new decorative effect.

[0006] Fancy yarns disclosed hereinafter are obtained by new production methods.

[0007] According to an aspect, a fancy yarn comprises: a yarn composed of a plurality of main fibers elongated in a main direction, the plurality of main fibers being false-twisted or real-twisted about the main direction; and a plurality of decorations composed of decorative fibers respectively independent of the main fibers and interlaced with and raised from the plurality of main fibers, the decorations being evenly or unevenly away in the main direction from each other.

[0008] According to another aspect, a fancy yarn is produced by: interlacing a plurality of main fibers elongated in a main direction with decorative fibers independent of the main fibers at even or uneven intervals in the main direction; and twisting the main fibers along with the entangled decorative fibers.

BRIEF DESCRIPTION OF DRAWINGS

[0009]

FIG. 1 is a schematic drawing of a fancy yarn.
FIG. 2A is a schematic drawing of a fancy yarn produced by false twist, which schematically illustrates two main fibers and two decorative fibers only.
FIG. 2B is a schematic drawing of a fancy yarn produced by real twist, which schematically illustrates two main fibers and two decorative fibers only.
FIG. 3A is a schematic drawing showing an aspect in which decorative fibers lightly tangled with a main yarn.
FIG. 3B is a schematic drawing showing the main yarn with the decorative fibers in a state where the entanglement is strengthened.
FIG. 3C is a schematic drawing of a finished fancy yarn.
FIG. 4 is a schematic elevational view of a device for producing a fancy yarn according to an embodiment, related to a case for imparting a false twist.
FIG. 5 is a schematic elevational view showing a part of a device related to a case for imparting a real twist.
FIG. 6 is a schematic elevational view showing another embodiment for entangling decorative fibers with main fibers.
FIG. 7 is a schematic elevational sectional view showing how to use a guide to entangle the decorative fibers with the main fibers.
FIG. 8 is a schematic elevational view of a device for producing a fancy yarn according to another embodiment.
FIG. 9 is a schematic elevational sectional view showing how to use a guide to entangle the decorative fibers with the main fibers.
FIG. 10 is a schematic elevational view of a device for producing a fancy yarn according to still another embodiment.

DESCRIPTION OF EMBODIMENTS

[0010] Exemplary embodiments will be described hereinafter with reference to the appended drawings. While the yarns are so drawn in FIGs. 4 through 10 where the production methods are described as to run from the top to the bottom, or from the right to the left, these directions are no more than exemplary illustrations and therefore the top and the bottom, or the right and the left, can be arbitrarily interchanged to embody those shown therein. Or, any aspects may be possible, where they are totally or partially inclined.

[0011] Referring mainly to FIG. 1, a fancy yarn 10 according to the present embodiment is generally com-

posed of yarn(s) 1(3) and decorations D respectively composed of decorative fibers. As will be understood by references to FIGs. 3A through 3C for example, the decorations are formed from decorative fibers 5c interlaced with the yarn(s) 1(3).

[0012] These yarn(s) 1(3) and the decorative fibers 5c are respectively made of any of synthetic fiber(s) such as polyester or polyamide, semisynthetic fiber(s) such as acetate, rayon or cupra, and natural fibers such as cotton, linen, wool or silk, or any mixed substance of two or more selected therefrom. The fibers constituting the yarn 1 and the yarn 3, and the decorative fibers 5c, may be identical or differentiated in properties such as thickness, color, gloss or material.

[0013] Each of the yarn(s) 1(3) is a bundle of fibers running generally in a main direction M and the yarns may be formed only of one main yarn 1 or may further contain another sub yarn 3. Of course, the yarns may further contain the other yarn(s). Fibers constituting these yarns are unitarily false-twisted about the main direction M as exemplarily shown in FIG. 2A, or unitarily real-twisted about the main direction M as exemplarily shown in FIG. 2B. Although each of these drawings merely illustrates two main fibers 1fa, 1fb, great many fibers are actually real-twisted or false-twisted to constitute the yarn(s) 1(3).

[0014] Each of the decorations D is composed of decorative fibers 5c that are shortly cut off from a yarn of the same or distinct sort from the main yarn. The decorative fibers 5c are interlaced with the fibers constituting the yarn(s) 1(3) and are therefore fixed therein. As described already, the decorative fibers 5c may be identical or differentiated from the yarn(s) 1(3) in properties such as thickness, color, gloss or material. Various combinations thereof would create a countless number of variations in decorative effects.

[0015] Referring back to FIG. 1, the decorations D may not be in series along the main direction M on the fancy yarn 10 but may be limited in discrete locations having lengths S_1, S_2, ... These lengths S_1, S_2, ... may be substantially identical to each other but may be distinct from each other. The mutual intervals V_1, V_2, ... may be also identical to each other (specifically, the decorations D may be at even intervals in the main direction M) or may be mutually distinct (specifically, the decorations D may be at uneven intervals in the main direction M). The lengths S_1, S_2, ... and the mutual intervals V_1, V_2, ... can be, as will be described later, arbitrarily increased or decreased depending on production conditions. Combinations of these parameters can create variations in decorative effects.

[0016] Referring mainly to FIG. 2A, while these drawings merely illustrates two decorative fibers 5ca, 5cb, all decorative fibers are, except end sections 5e of them, entangled with the main fibers 1fa, 1fb but these end sections 5e and these proximities deflect outward and project from the main fibers 1fa, 1fb, or more specifically, raised. In a case of imparting a false twist, the main fibers 1 get mutually interlaced and further the decorative fibers 5c get interlaced with the structure, so that the decorative fibers 5c hardly fall off. In a case of imparting a real-twist, of course, as shown in FIG. 2B, the decorative fibers 5c are caught in the real-twist structure and therefore less likely fall off. While the decorative fibers 5c, as being raised to present a nap-like appearance, contribute to decorativeness, the fibers hardly fall off unlike real naps and the appearance of the fancy yarn 10 is hardly damaged by processes of weaving or knitting, and therefore the fancy yarn 10 can give stable decorativeness to fabrics or knits.

[0017] The end sections 5e and these proximities deflect outward and project from the main fibers as described already. These sections mainly control the appearance of the decorations D and are material elements for the decorative effect of the present embodiment. These lengths may be controlled by the production condition. All the end sections 5e, however, do not necessarily deflect outward but some of them may be buried in the main fibers.

[0018] Needless to say, all the decorations D may be identical in properties such as thickness, color, gloss or material (nylon, polyester or any) but may be differentiated from each other. The combinations thereof may create a countless number of variations in the decorative effect.

[0019] The fancy yarn 10 may be produced by the process as described below for example.

[0020] Referring mainly to FIG. 4, generally, the main yarn 1 is fed out of a main feeding creel 11, passed through a twisting device 23, and wound around a winder 31. At a confluence region 17 on this way, decorative fibers 5c are fed sideways onto the main yarn 1 and there flow with the main yarn 1, thereby being delivered together to the twisting device 23. To guide the main yarn 1 in this way, any yarn guides such as rings or rollers may be properly arranged.

[0021] The decorative fibers 5c are, originally in a form of an uncut and long yarn 5, fed from a decorative yarn creel 15, cut intermittently by a cutter 21, carried by an airflow A1 through a jet nozzle 19, and fed to the confluence region 17. Or, pre-cut decorative fibers 5c may be stored anywhere and in small batches ejected by means of the airflow A1 toward the confluence region 17. The airflow A1 can be created by a blower or a compressor connected to the jet nozzle 19.

[0022] The decorative fibers 5c are carried by the airflow A1 to reach the confluence region 17 and there form a confluent flow with the main yarn 1. Then the main yarn 1 may, presumably by means of vibration associated with its run and also presumably assisted by vibration caused by the airflow A1, capture the decorative fibers 5c. Then the decorative fibers 5c may, as illustrated in FIG. 3A, run simply along the main yarn 1 or lightly tangle therein.

[0023] The sub yarn 3 is fed from the sub feeding creel 13 and, at an area upstream or downstream from the confluence region 17, form a confluent flow with the main yarn 1. FIG. 4 illustrates an example where such a con-

fluence appears at the area downstream from the confluence region 17, and in this example the sub yarn 3 embraces the decorative fibers 5c and then runs along the main yarn 1. This may enhance the function for capturing the decorative fibers 5c within the yarns 1, 3.

[0024] While, in the example shown in FIG. 4, three feeding creels feed the main yarn, the sub yarn and the decorative yarn respectively, feeding creels may be further provided to feed two or more main yarns or two or more sub yarns. Further, two or more decorative yarns may be used and, in this case, the combination of the feeding creel, the jet nozzle, the cutter and the confluence region should be added. As described already, the plural decorative yarns may be differentiated in properties such as thickness, color, gloss or material.

[0025] The main yarn 1 along with the decorative fibers 5c and the sub yarn 3 runs through the twisting device 23 and thereby being twisted by the twisting device 23. In a case of imparting a false twist, a swirling nozzle which swirls airflow to give false twist to a yarn is applicable to the twisting device 23.

[0026] The twisting device 23 is mainly used to prevent the decorative fibers 5c from falling off, and is not necessarily required to bundle the yarns 1, 3 together. The yarns 1, 3 and the decorative fibers 5c after passing through the twisting device 23 fall into a state illustrated in FIG. 3B for example.

[0027] Referring back to FIG. 4, to strengthen entanglement among the yarns 1, 3 and the decorative fibers 5c flowing together, an interlacing device 25 may be used. The interlacing device 25 may for example include a water-application guide 27 and a tangling nozzle 29.

[0028] The water-application guide 27 is a yarn guide with a nozzle capable of ejecting a small amount of water to the yarns. Or, instead of use of the water-application guide 27, a tangling nozzle 29 may be provided with a water nozzle. By applying a small amount of water to the yarns, it is enabled to further strengthen entanglement among the yarns 1, 3 and the decorative fibers 5c.

[0029] The tangling nozzle 29 is a publicly known tangling nozzle that uses a blower or such to eject relatively high-speed airflow. The airflow creates relatively high-speed turbulence around the yarn, thereby giving interlacement to the yarn passing through the nozzle.

[0030] By using the interlacing device 25, the yarns 1, 3 are mutually bundled and are interlaced with the decorative fibers 5c to be firmly entangled together, thereby the fancy yarn 10 as illustrated in FIG. 3C is obtained.

[0031] Although the aforementioned description relates to an example for using the tangling nozzle, instead applicable is an interlacing nozzle, or any false-twist device such as a combination of a hollow spindle or a friction-type twisting device and a heater. Still alternatively, in place of or in addition to the processing means for the yarns, heating or adhesion is applicable. As heating means, a heater, a laser oscillator and an ultra-sonic generator may be exemplified.

[0032] In addition, although the aforementioned description relates to an example in which a false twist is given to the yarn, a real twist is applicable in place of the false twist. In this case, in place of the twisting device 23 for example, a real-twisting device 23b as illustrated in FIG. 5 is used. The real-twisting device 23b is a combination of a twister and a spindle for example. In this case, the spindle can also function as a winder. The real twist can also cause the decorative fibers 5c to securely tangle in the yarns 1, 3 and thus the yarns 1, 3 are more tightly bundled together. As the decorative fibers 5c can be firmly entangled in the main yarn 1, the process for interlacing by the interlace device 25 may be omitted.

[0033] In this example as well, a yarn guide 23a may be disposed downstream from the confluence region 17 but upstream from the twisting device 23b. The yarn guide 23a merely has a function mainly for merging the main yarn 1 and the decorative yarn 5 with the sub yarn 3 and guiding these yarns but may have an additional constitution for swirling or processing the yarns.

[0034] In the process of merging the decorative fibers 5c with the yarns 1, 3, by swirling the yarns 1, 3, capture of the decorative fibers 5c by the yarns 1, 3 may be promoted. This prominently reduces the chance of unintended drop of the decorative fibers 5c from the yarns 1, 3 in the confluence process. Controllability of intervals V1, V2, ... between adjacent decorations D is necessarily improved to a remarkable extent.

[0035] Referring to FIG. 6 for example, the feeding creels 11, 13 may be disposed, although not necessarily, axisymmetrically for example and the main yarn 1 and the sub yarn 3 are fed respectively therefrom toward the confluence region 17 to form a confluent flow of the yarns 1, 3 there. The decorative fibers 5c are supplied to the confluent region 17 along an axis where the yarns 1, 3 run, vertically for example. For the purpose of such supply, the combination of the jet nozzle 19 and the cutter 21 can be used in a way as described above but is not essential.

[0036] The twisting device 23 disposed downstream from the confluent region 17, on the other hand, is a swirling nozzle as described already for example, which swirls the merged yarns 1, 3. This swirling motion is transmitted to the confluence region 17 and therefore the decorative fibers 5c are fed to and captured by the swirling yarns 1, 3, thereby being entangled therewith and incorporated therein.

[0037] To promote entanglement of the decorative fibers 5c with the yarns 1, 3, a guide 39 as illustrated in FIG. 7 may be used. The guide 39 has an opening at one end (normally its lowermost end) and ejects the introduced yarns 1, 3 with the decorative fibers 5c therethrough. The interior of the guide 39 is an internal space elongated along the axial direction, which is so dimensioned that the yarns 1, 3 can swirl to some degree about the axial direction in the interior. The guide 39 may further have openings 41, 43 on its side faces and the yarns 1, 3 may be introduced these opening 41, 43 into the interior.

[0038] The decorative fibers 5c are introduced through

the uppermost end of the guide 39 and are guided therethrough, thereby being entangled with and incorporated in the swirling yarns 1, 3.

[0039] Referring again to FIG. 6, the mutually merged yarns 1, 3 and the decorative fibers 5c are given swirling by the twisting device 23 and thereby entangled together. As with the method described already, the interlacing device 25 may be used to further strengthen the entanglement but the interlacing device 25 may be omitted of course. The fancy yarn 10 produced by the method is wound by the winder 31.

[0040] Or, swirling induced by separation of the yarn from the bobbin may be used to entangle the decorative fibers 5c into the yarn 1.

[0041] Referring to FIG. 8 as an example, bobbins 11, 13 disposed coaxially for example, or offset properly, are used. Between the bobbins 11, 13, centering guides 16 may be disposed for guiding the main yarn 1 to the center. The yarns 1, 3 are wound respectively around the bobbins 11, 13 and, by rotating the bobbins 11, 13 about the axis, the yarns 1, 3 are respectively fed out with swirling about the axis.

[0042] The decorative fibers 5c are intermittently fed to a region between the centering guides 16 for example. In this region, the main yarn 1 still keeps swirling and the decorative fibers 5c are thus caught therein and entangled with the main yarn 1.

[0043] To ensure entanglement of the decorative fibers 5c with the main yarn 1, a guide 17 as illustrated in FIG. 9 may be used. The guide 17 is for example a hollow cylinder in general and its interior is a hollow 17h elongated in the axial direction. On upper and lower side faces thereof, openings 17t are opened and a main yarn 1 is guided through the openings 17t to the bobbin 13. The hollow 17h is further structured so that the decorative fibers 5c supplied through the jet nozzle 19 can pass through the hollow. The guide 17 may be joined with or in a unitary form with the jet nozzle 19.

[0044] The hollow 17h is so dimensioned that the main yarn 1 can swirl about the axis in its interior. The main yarn 1 that swirls just below the guide 17 can keep swirling in the hollow 17h even after passing through the lower opening 17t. By being caught in the swirling, the decorative fibers 5c are ensured to entangle with the main yarn.

[0045] At least to the bobbin 13, a bobbin used in combination with a hollow spindle in publicly known covering machines is applicable. Into the hollow spindle, the main yarn 1 accompanied by the decorative fibers 5c is introduced and the sub yarn 3 fed from the bobbin 13 keeps swirling and winds itself thereon. The decorative fibers 5c are caught in and firmly entangled with the yarns 1, 3, and are, along with the yarns 1, 3, given real twist, thereby the fancy yarn 10 is produced.

[0046] The sizes and the lengths S_1, S_2, ... of the decorations D formed by the decorative fibers 5c can be arbitrarily changed by changing the cutting lengths of the decorative yarn 5, and the mutual intervals V_1, V_2, ... between the adjacent decorations D can be also arbitrarily changed by changing the feeding speed and the cutting intervals of the yarn 1. Needless to say, each size and each length can be changed in regard to each decoration D. Further, as described already, as two or more decorative yarns can be used, each decorations D can have each color and each gloss for example.

[0047] As will be understood from the preceding descriptions, every decoration D has a structure similar to nap as it deflects outward from the yarn but does not readily fall off unlike the nap. Unlike chenille yarns as well, the decorations D are not continuous but may be separated evenly or unevenly away from each other. Such a structure has a unique character not found in fancy yarns produced by conventional production methods. Its decorative effect has a countless number of variations in terms of thickness of the fibers, color, gloss or any material properties. Specifically, according to the present embodiment, unique decorative effects different from those by the conventional yarns can be created in the fancy yarn 10 and, needless to say, any fabric woven or knitted therefrom can create unique decorative effects. The present embodiment provides new variations in decorative effects for the art of the yarn and the fabric.

[0048] Although certain embodiments have been described above, modifications and variations of the embodiments described above will occur to those skilled in the art, in light of the above teachings.

INDUSTRIAL APPLICABILITY

[0049] A production device is provided, which provides a new option for the art of fancy yarns.

Claims

1. A fancy yarn comprising:

a yarn composed of a plurality of main fibers elongated in a main direction, the plurality of main fibers being false-twisted or real-twisted about the main direction; and
a plurality of decorations composed of decorative fibers respectively independent of the main fibers and entangled with and raised from the plurality of main fibers, the decorations being evenly or unevenly away in the main direction from each other.

2. The fancy yarn of claim 1, wherein the decorative fibers are cut shorter than the main fibers to have both end sections and are, except the end sections, entangled with the main fibers, and the end sections deflect outward and project from the main fibers.

3. The fancy yarn of claim 1, wherein the plurality of main fibers include a first main fiber and a second main fiber different in any properties including color

and thickness from the first main fiber.

4. The fancy yarn of claim 1, wherein, in the plurality of decorations, one decoration and another decoration adjacent to the one decoration are different in any properties including color and thickness from each other.

5. A fancy yarn, produced by:

entangling a plurality of main fibers elongated in a main direction with decorative fibers independent of the main fibers at even or uneven intervals in the main direction; and
twisting the main fibers along with the entangled decorative fibers.

6. The fancy yarn of claim 5, wherein the twisting step further comprises swirling the main fibers to promote entanglement of the decorative fibers into the main fibers.

7. The fancy yarn of claim 5, wherein the plurality of main fibers include a first main fiber and a second main fiber different in any properties including color and thickness from the first main fiber.

8. The fancy yarn of claim 5, wherein the decorative yarns include a fiber different in any properties including color and thickness from the plurality of main fibers.

FIG. 1

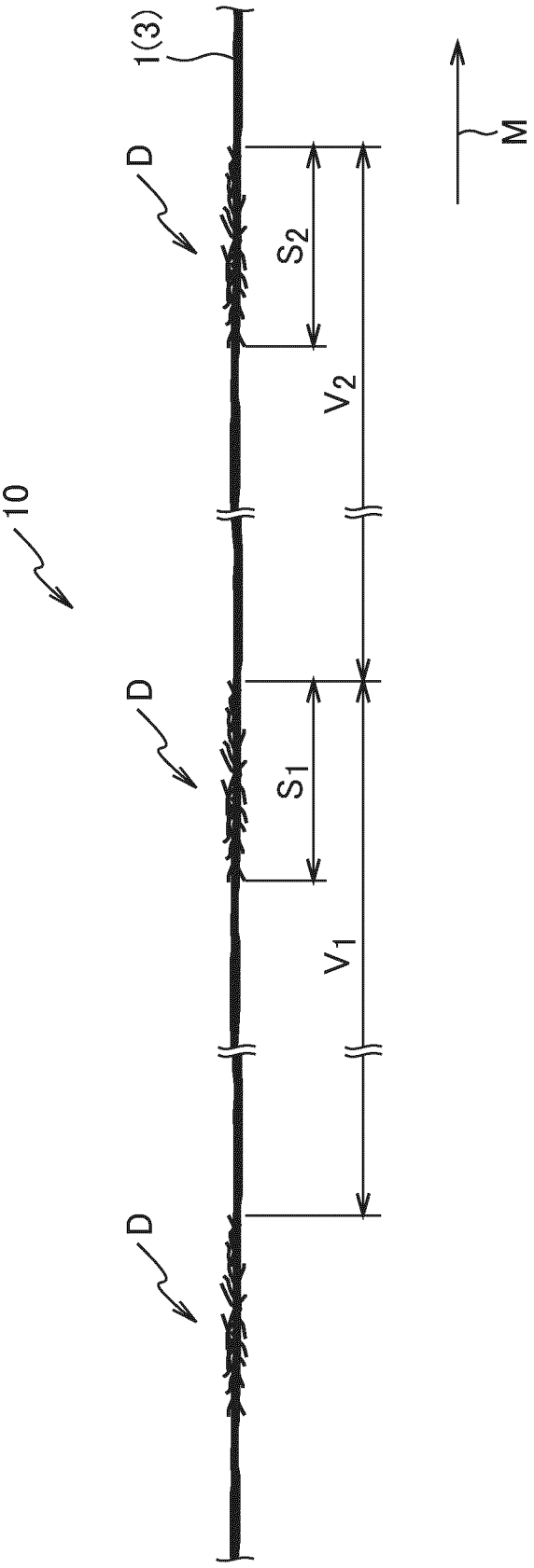


FIG. 2A

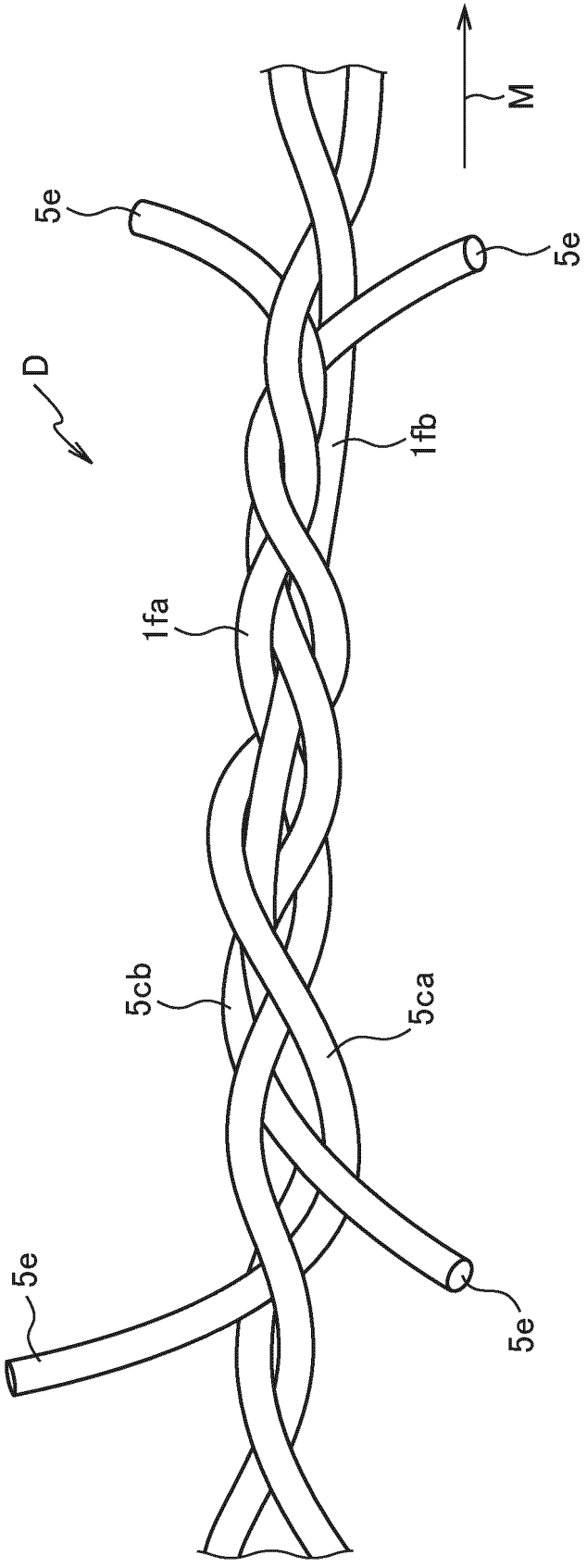
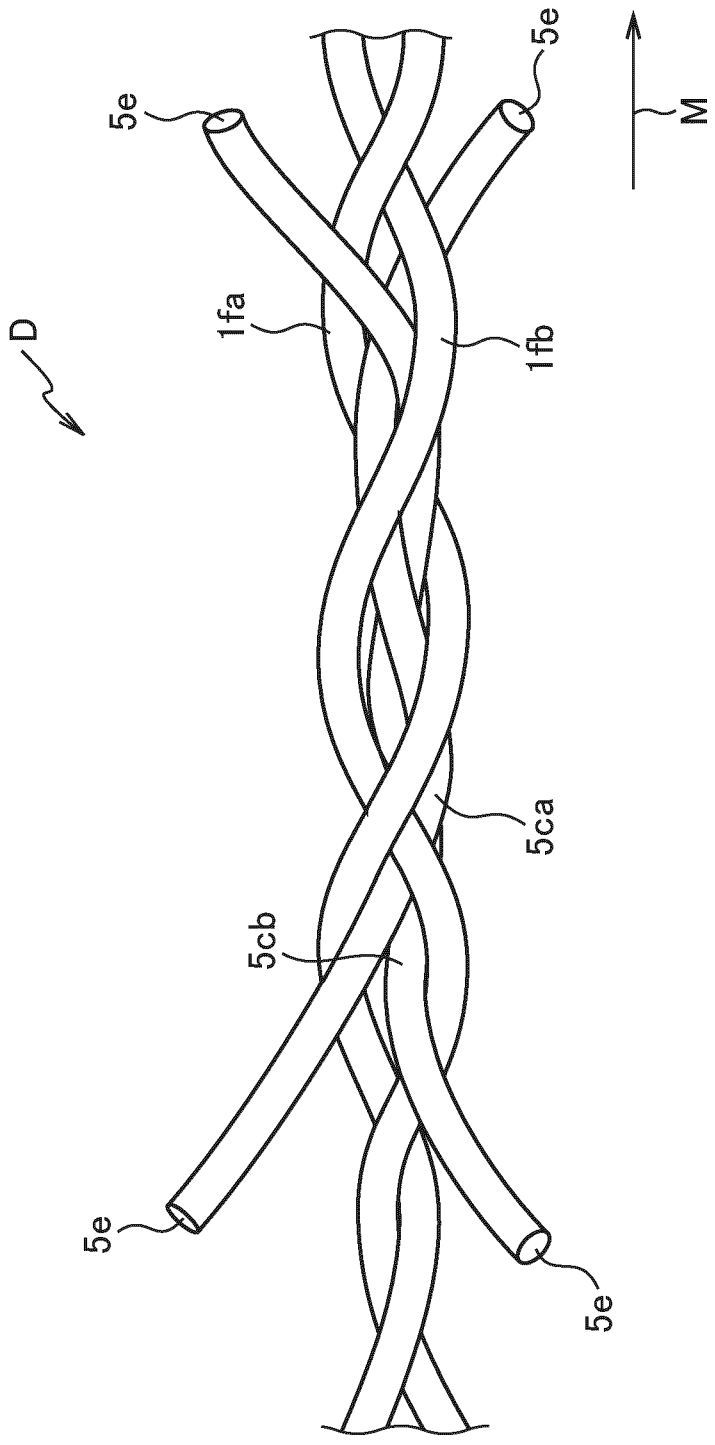


FIG. 2B



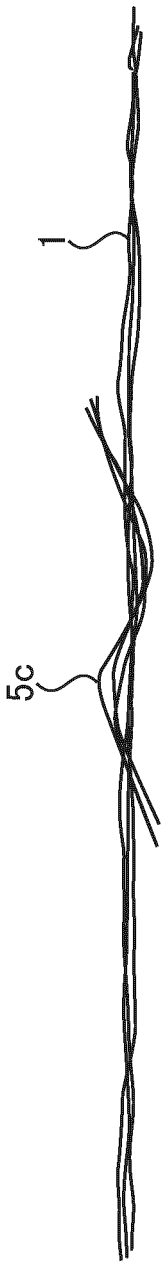


FIG. 3A

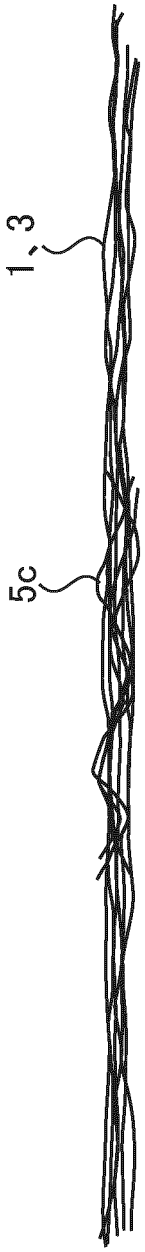


FIG. 3B

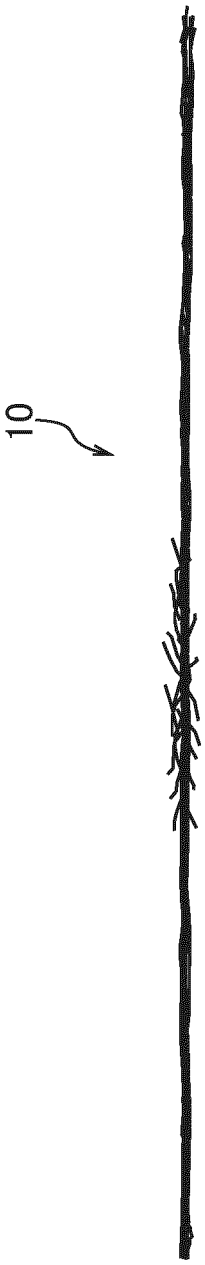


FIG. 3C

FIG. 4

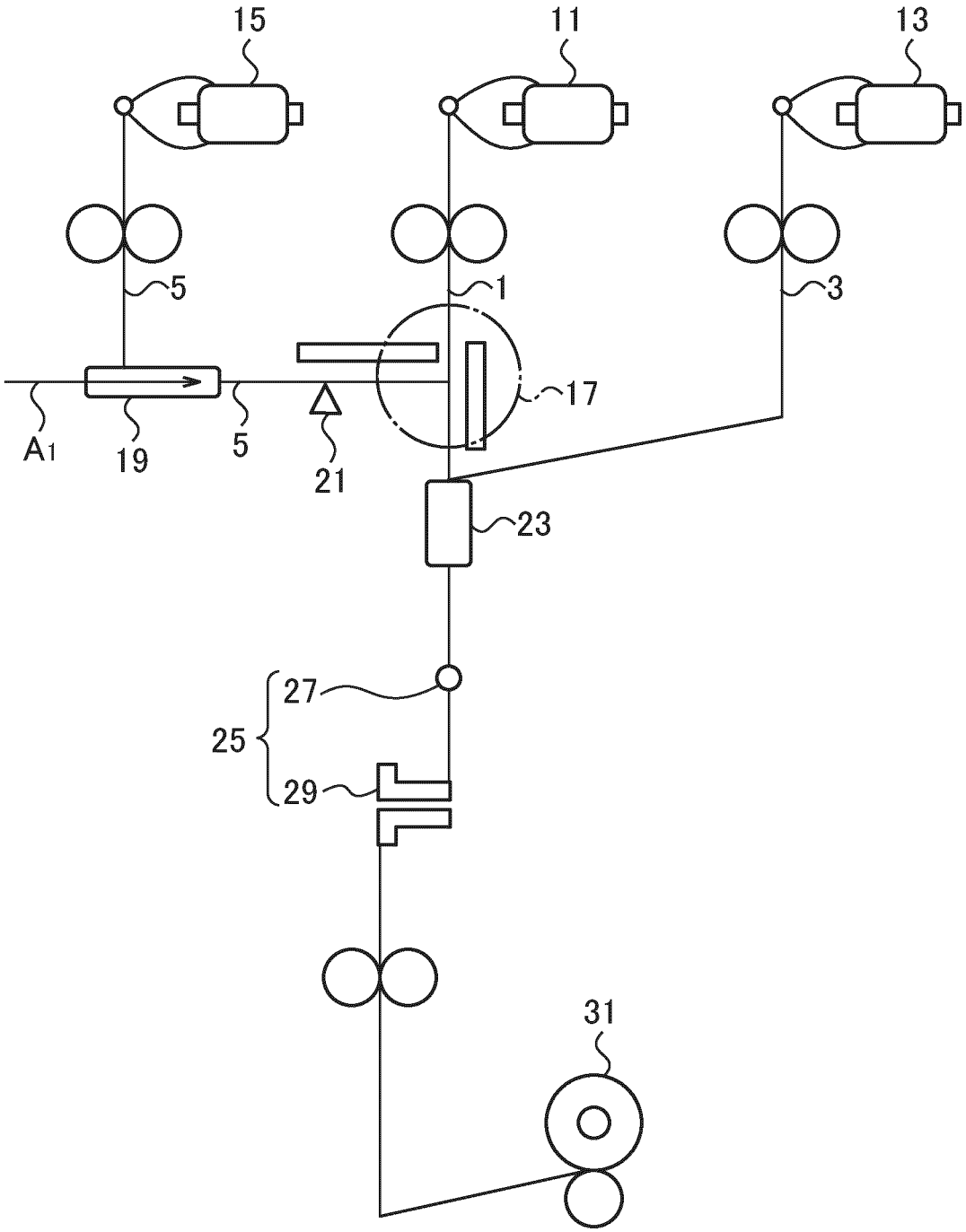


FIG. 5

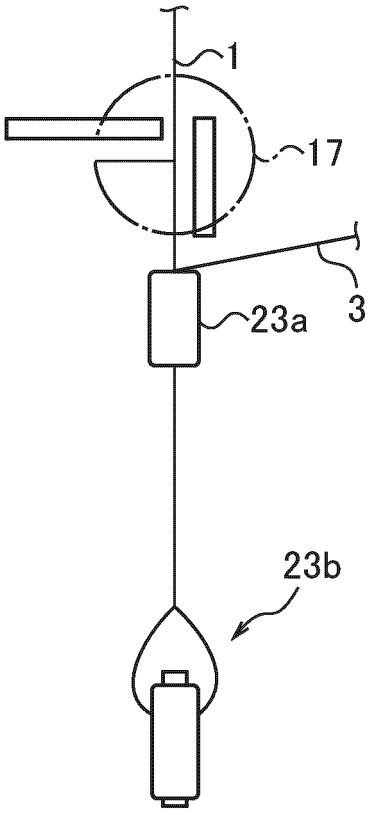


FIG. 6

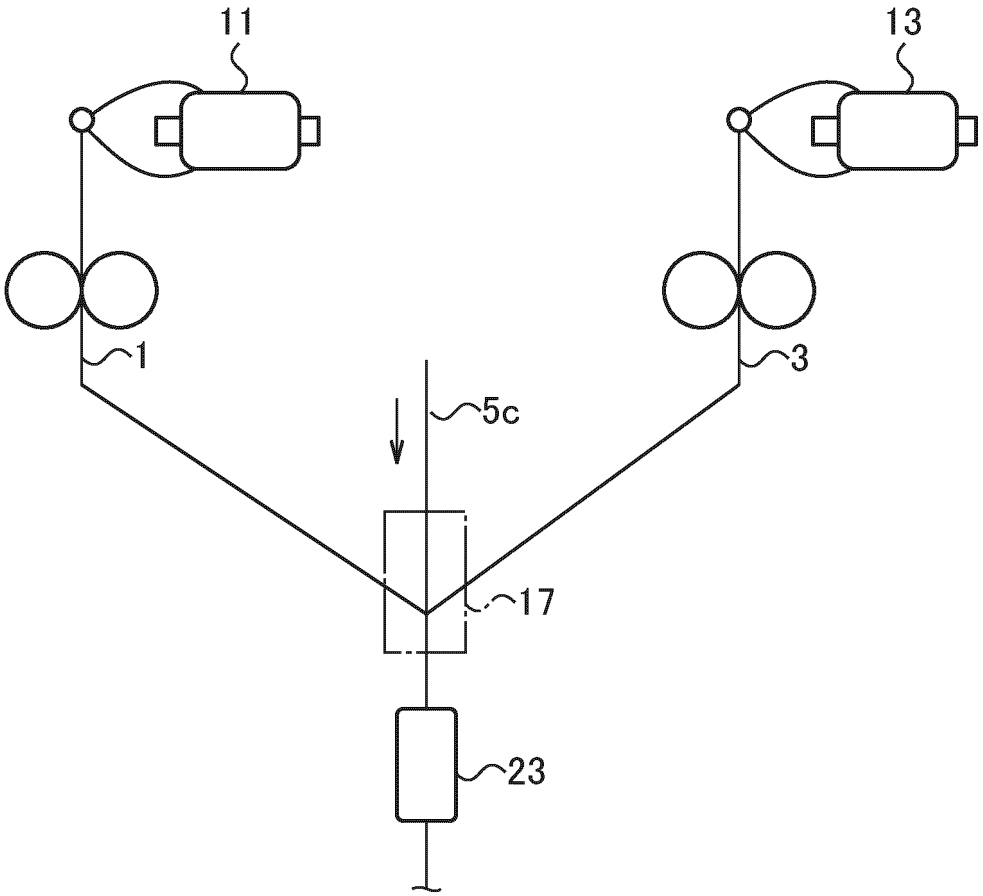


FIG. 7

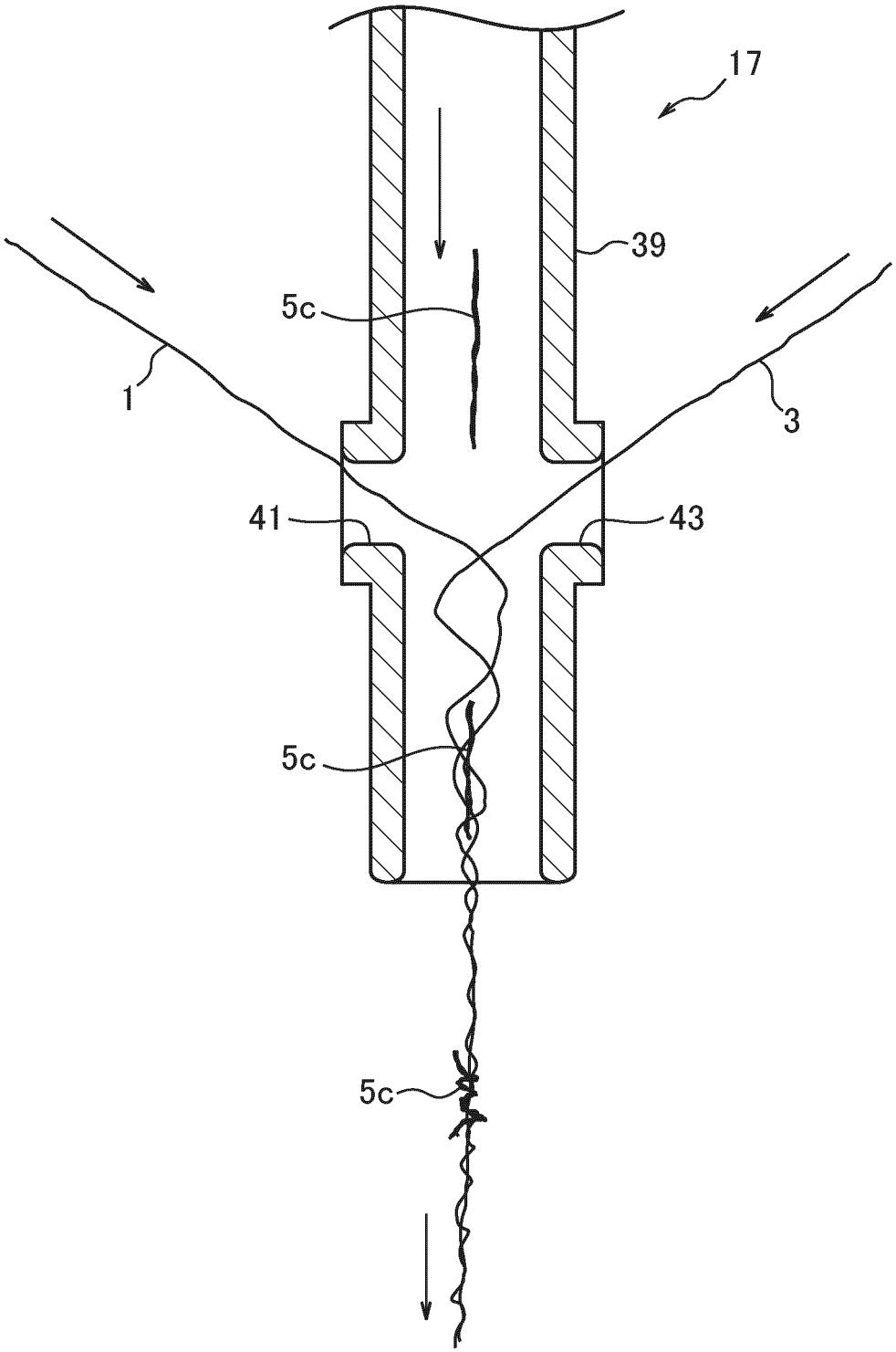


FIG. 8

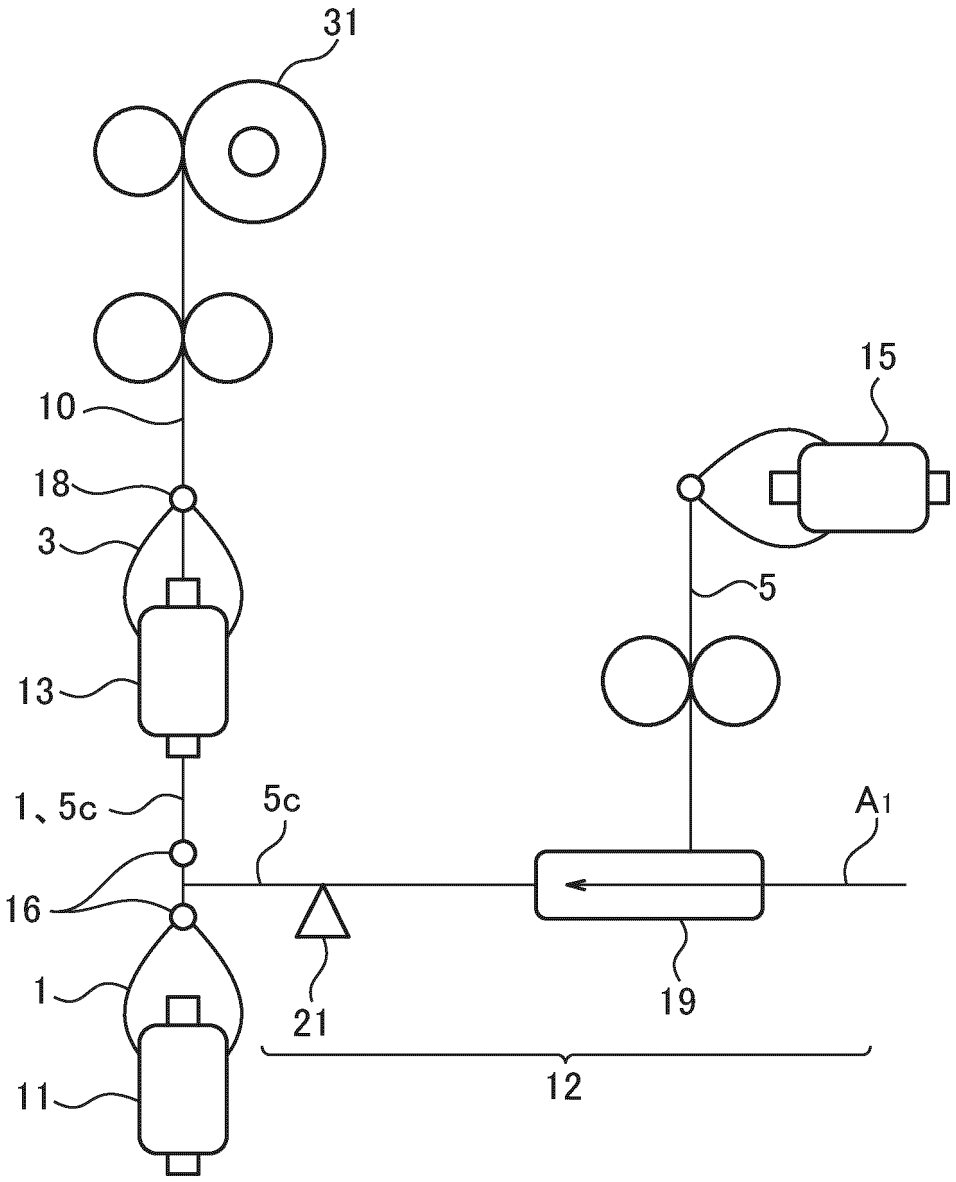


FIG. 9

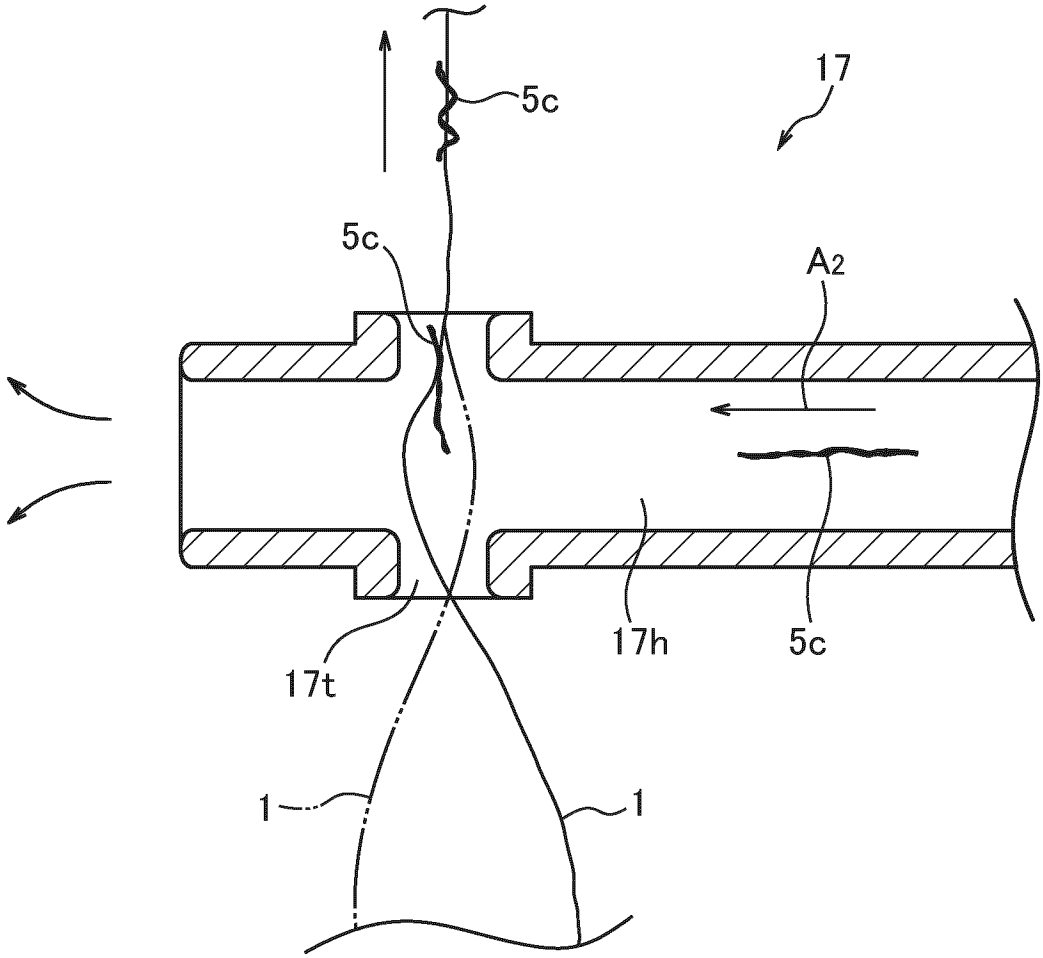
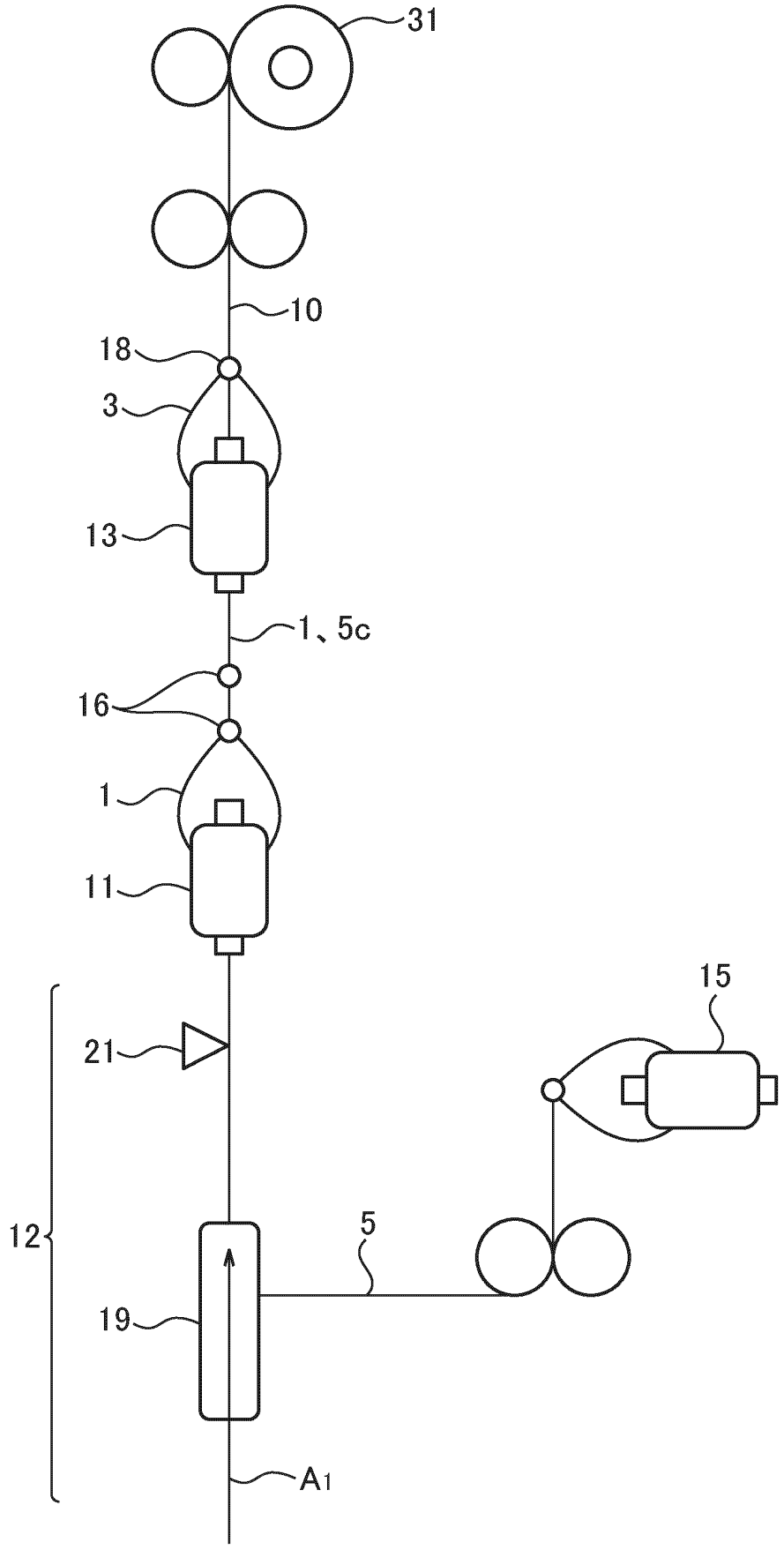


FIG. 10



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2022/009009

A. CLASSIFICATION OF SUBJECT MATTER

D02G 3/34(2006.01)i
FI: D02G3/34

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)

D02G1/00-3/48; D02J1/00-13/00

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

Published examined utility model applications of Japan 1922-1996
Published unexamined utility model applications of Japan 1971-2022
Registered utility model specifications of Japan 1996-2022
Published registered utility model applications of Japan 1994-2022

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.
X	JP 49-41133 B1 (TEIJIN LIMITED) 07 November 1974 (1974-11-07) claims, column 3, line 8 to column 4, line 34, fig. 1-7	1-8
X	JP 57-133225 A (MITSUBISHI RAYON CO) 17 August 1982 (1982-08-17) claims, p. 3, upper left column, lines 4-8	1-5, 7, 8
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☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

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07 April 2022	**19 April 2022**
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