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(71) Applicant: **LG Electronics Inc.**
Yeongdeungpo-gu
Seoul 07336 (KR)

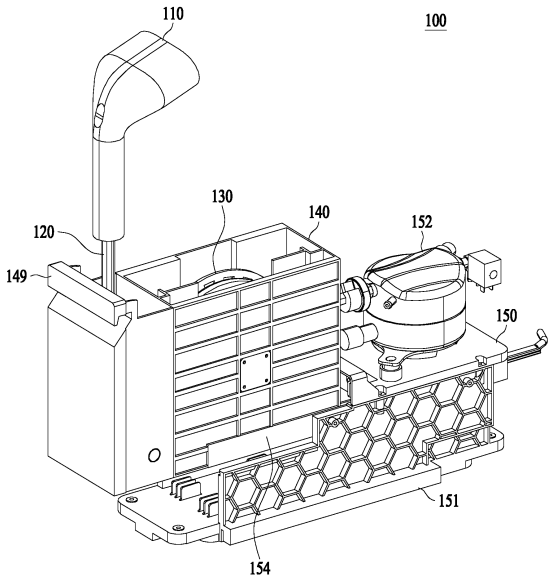
(72) Inventors:
- **PARK, Bo Kyong**
  Seoul 08592 (KR)
- **SONG, Sung Ho**
  Seoul 08592 (KR)
- **LEE, Jae Myoung**
  Seoul 08592 (KR)

(74) Representative: **Vossius & Partner**
Patentanwälte Rechtsanwälte mbB
Siebertstrasse 3
81675 München (DE)

(54) HIGH-PRESSURE STEAMER MODULE, AND CLOTHING TREATING APPARATUS INCLUDING SAME

(57) Provided is a high-pressure steamer module including a steamer, a composite cable of which one end is connected to the steamer and another end is connected to an external supply source, which is configured to carry high-pressure steam and electric power from the external supply source to the steamer, a reel on which the composite cable is wound, a case in which the steamer, the composite cable, and the reel are stored, a power shaft fitted in the reel to share a rotational axis with the reel and configured to transmit rotation power to the reel, and an actuator configured to rotate the power shaft to wind or unwind the composite cable on or from the reel.

FIG. 1



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Description

Technical Field

[0001] The present disclosure relates to a high-pressure steamer module and a clothing treating apparatus including the same.

Background Art

[0002] A steamer is a device to smooth and manage the creases of clothes by spraying vapor or steam generated when heating water at high temperatures on clothes. For the steamer to spray steam, steam and electric power are to be supplied to the steamer. Accordingly, the steamer may be provided with a cable for supplying electric power as well as a steam hose for supplying steam. In this case, storing the steamer requires a measure for storing the hose and the cable.

[0003] Existing automatic reel devices that store/use a hose or a cable in a reel form are merely developed and used for storing a hose transferring a single substance such as water, air, and steam or a cable transmitting electric power (Korean laid-open patent publication No. 10-2006-0128454 and Korean laid-open patent publication No. 10-2007-0076184), and a manual storing action is required for arranging a composite cable that is one line into which two or more types of hoses or cables together are combined (for example, a hose for transferring steam and a cable for transmitting electric power are combined).

Detailed Description of the Invention

Technical Goals

[0004] The present disclosure provides an automatic reel of a composite cable into which a fluid transfer hose and a power line are combined. Resolving a problem in a composite cable of being twisted when unwinding or winding from or on a high-pressure steamer module may allow stable and automatic line arrangement of the composite cable, thereby enhancing user convenience.

[0005] The technical goals to be achieved in the present disclosure are not limited to the technical goals described above, and other technical goals may be inferred from the example embodiments below.

Technical solutions

[0006] According to an example embodiment, a high-pressure steamer module may include a steamer, a composite cable of which one end is connected to the steamer and another end is connected to an external supply source, which is configured to carry high-pressure steam and electric power from the external supply source to the steamer, a reel on which the composite cable is wound, a case in which the steamer, the composite cable, and the reel are stored, a power shaft fitted in the reel to share a rotational axis with the reel and configured to transmit rotation power to the reel, and an actuator configured to rotate the power shaft to wind or unwind the composite cable on or from the reel.

[0007] In addition, the composite cable may include a first partial composite cable toward the steamer and a second partial composite cable toward the external supply source which are partitioned off based on a first point on the composite cable, and the reel may include a first storage part on which the first partial composite cable is wound and stored, a second storage part on which the second partial composite cable is wound and stored, and a guide part configured to fix the first point.

[0008] In addition, a first winding direction of the first partial composite cable and a second winding direction of the second partial composite cable may be identical, and the guide part may be configured to guide the composite cable to turn around at the first point.

[0009] In addition, the guide part may be provided on one side of a cable-seating surface of the reel to form a "U"-shaped path, and both ends of the path may be provided to face one direction perpendicular to a rotational axis of the reel.

[0010] In addition, the guide part may include a first guide wall formed in a first direction parallel to a rotational axis of the reel, a second guide wall formed to be perpendicular to the first direction, and a third guide wall formed to be perpendicular to the first direction and formed opposite to the second guide wall, and the first point may be positioned to be adjacent to the first guide wall, and the first partial composite cable may be guided to be bent along the first guide wall and the second guide wall and wound on the first storage part, and the second partial composite cable may be guided to be bent along the first guide wall and the third guide wall and wound on the second storage part.

[0011] In addition, the reel may further include an engaging part formed in a protrusion form on a cable-seating surface of the reel and a cover engaged with the engaging part and configured to cover a portion of the composite cable so that the composite cable is not left out of the cable-seating surface and the guide part.

[0012] In addition, the composite cable may include a first sheath that forms a path of high-pressure steam, a second sheath that forms a path of electric power transmission, and a third sheath that surrounds the first sheath and the second sheath, and the third sheath may be provided excluding an area where the composite cable turns around.

[0013] In addition, the case may include a partition wall configured to partition the case into a first space and a second space, and the first storage part may be positioned in the first space, and the second storage part may be positioned in the second space.

[0014] In addition, the case may further include a hollow, provided on an outer wall of the case, through which the second partial composite cable passes and a holder

installed around the hollow and configured to limit movement in a length direction of the second partial composite cable for the second partial composite cable passing through the hollow not to additionally come out of the case or additionally go into the case.

[0015] In addition, the high-pressure steamer module may further include a steam generator module configured to generate high-pressure steam, and the steam generator module may include a frame and a cable passage, formed along a wall surface on an inner side of the frame, through which the composite cable passes.

[0016] In addition, the case may further include a fixed shaft of which opposite ends are fixed to a first side wall of the case and a second side wall of the case which is opposite to the first side wall of the case and a roller case configured to surround an outer circumferential surface of the fixed shaft and to be rotatable based on the fixed shaft, and the roller case may be configured to bend the composite cable in a circumferential direction of an outer circumferential surface of the roller case and change a winding direction of the composite cable.

[0017] In addition, the power shaft may include a cross-section in a polygonal shape.

[0018] In addition, the actuator may include a decelerator.

[0019] In addition, the high-pressure steamer module may further include a user input device configured to operate the actuator to wind or unwind the composite cable on or from the reel in response to a user input.

[0020] In addition, the user input device may be provided on a handle of the steamer.

[0021] According to an example embodiment, a clothing treating apparatus may include a cabinet of which a front is opened and inside which an accommodation space is formed, a door configured to open and close the cabinet, a cabinet partition wall configured to partition the accommodation space into a clothing accommodation space and a parts accommodation space, and a high-pressure steamer module positioned in the parts accommodation space.

[0022] In addition, the high-pressure steamer may include a steamer, a composite cable of which one end is connected to the steamer and another end is connected to an external supply source, which is configured to carry high-pressure steam and electric power from the external supply source to the steamer, a reel on which the composite cable is wound, a case in which the steamer, the composite cable, and the reel are stored, a power shaft fitted in the reel to share a rotational axis with the reel and configured to transmit rotation power to the reel, and an actuator configured to rotate the power shaft to wind or unwind the composite cable on or from the reel.

[0023] In addition, the high-pressure steamer module may further include a rail, and the case may be assembled on the rail to be movable along the rail, and the case may be guided by the rail to be suitable for entering and exiting the parts accommodation space.

[0024] In addition, the clothing treating apparatus may further include a hook at an upper portion of the front of the cabinet or an upper portion of an inner surface of the door in order for clothing to hang.

[0025] In addition, the clothing treating apparatus may further include a shelf inside the cabinet.

[0026] In addition, the parts accommodation space may be provided with a water supply part configured to store water to be provided as steam to the clothing accommodation space and a recovery part configured to recover steam from the clothing accommodation space to store.

[0027] Details of example embodiments are included in the detailed description and drawings.

Effects of the Invention

[0028] According to the present disclosure, it is possible to transfer fluid and electric power without cable segmentation.

[0029] Further, according to the present disclosure, it is possible to implement a reel structure with no change in a rotational axis angle of a fluid hose.

[0030] Further, according to the present disclosure, it is possible to configure a high-pressure steamer module without using a rotary joint.

[0031] Further, according to the present disclosure, it is possible for a user to wind or unwind a cable more conveniently by controlling winding and unwinding in a reel through a motor.

[0032] The effects to be obtained in the present disclosure are not limited to the aforementioned effects, and other effects not mentioned herein will be clearly understood by those skilled in the art from the attached claims.

Brief Description of Drawings

[0033]

FIG. 1 illustrates an example embodiment of a high-pressure steamer module according to an example embodiment of the present disclosure.

FIG. 2 illustrates a partial top view of a high-pressure steamer module according to an example embodiment of the present disclosure.

FIG. 3 illustrates the vicinity of a first point of a high-pressure steamer module according to an example embodiment of the present disclosure.

FIG. 4 illustrates the vicinity of a first point of a high-pressure steamer module according to an example embodiment of the present disclosure.

FIG. 5 illustrates an example embodiment of a composite cable according to an example embodiment of the present disclosure.

FIG. 6 illustrates an example embodiment of a high-pressure steamer module according to an example embodiment of the present disclosure.

FIG. 7 illustrates the vicinity of a steam generator module of a high-pressure steamer module according to an example embodiment of the present disclosure.

FIG. 8 illustrates a partial top view of a high-pressure steamer module according to an example embodiment of the present disclosure.

FIG. 9 illustrates a cross-section in the vicinity of a rotational axis of a reel in a high-pressure steamer module according to an example embodiment of the present disclosure.

FIG. 10 illustrates an example embodiment of a steamer according to an example embodiment of the present disclosure.

FIG. 11 illustrates an example embodiment of a clothing treating apparatus including a high-pressure steamer module according to an example embodiment of the present disclosure.

Mode for Carrying Out the Invention

[0034] Example embodiments of the present disclosure are illustrative rather than limiting the present disclosure and those skilled in the art may design many alternative example embodiments without departing from the scope of the disclosure as defined by the appended claims. Terms used in example embodiments are selected from currently widely used general terms when possible while considering the functions in the present disclosure. However, the terms may vary depending on the intention of one of ordinary skilled in the art, legal precedents, emergence of new technologies, and the like. Further, in certain cases, there may be terms arbitrarily selected by the applicant, and in this case, the meaning of the term will be described in detail in the corresponding description. Therefore, the terms used in the present disclosure are not to be construed simply as its designation but based on the meaning of the term and the overall context of the present disclosure.

[0035] A singular expression used herein includes both the singular and the plural unless clearly otherwise specified by context.

[0036] Throughout the specification, when a part is described as "comprising or including" a component or an operation, the part is not intended to necessarily include all the component or operation and not intended to exclude components or operations other than those described in the claims and the specification but may further include the component or the operation, unless otherwise stated.

[0037] In addition, while terms including ordinal numbers such as first, second, etc. used herein may be used to describe various elements, these elements should not be limited by the terms including ordinal numbers. The terms are only used to distinguish one element from another in a part of the specification contextually. For example, a first element may be referred to as a second element in one part of the specification, and conversely, a second element may be referred to as a first element in another part of the specification, without departing from the scope of the present disclosure.

[0038] Terms such as "mechanism," "element," "means," and "configuration" may be used broadly herein and are not limited to mechanical and physical configurations. The terms may include the meaning of a series of routines of software in association with a processor or the like.

[0039] The use of the terms "a" and "an" and "the" and similar referents in the context of describing the present disclosure (especially in the context of the claims) is to be construed to cover both the singular and the plural. Further, a recitation of ranges of values herein is merely intended to serve as a shorthand method of referring individually to each separate value falling within the range (unless otherwise indicated), and each separate value is incorporated into the specification as if it were individually recited herein. In addition, the operations of all methods described herein may be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The present disclosure is not limited to the described order of the operations. The use of any and all examples, or language (e.g., "for example" and the like) provided herein, is intended merely to better illuminate the present disclosure and does not pose a limitation on the scope of the present disclosure unless otherwise claimed. Those skilled in the art may add various modifications, combinations, and variations to example embodiments disclosed herein according to design conditions and factors and may implement other example embodiments that fall within the scope of the claims or the range of equivalents thereof.

[0040] Hereinafter, example embodiments of the present disclosure will be described with reference to the accompanying drawings. For brevity of the specification and the drawings, various functional elements that are not related to understanding the present disclosure are omitted from the drawings. However, those skilled in the art may easily understand that various additional elements may be included as a part of specific example embodiments of the present disclosure so as to enable additional functions that are not specifically described in the present disclosure.

[0041] FIG. 1 illustrates an example embodiment of a high-pressure steamer module 100 according to an example embodiment of the present disclosure.

[0042] In an example embodiment, the high-pressure steamer module 100 may include a steamer 110. The

steamer 110 may include a handle that a user may hold by hand and a nozzle. The user may place the nozzle of the steamer 110 near clothes or cloth while holding the handle of the steamer 110 and manipulate the high-pressure steamer module 100 so that high-pressure steam is sprayed onto the cloth.

[0043] In an example embodiment, the high-pressure steamer module 100 may include a composite cable 120 of which one end is connected to the steamer 110 and another end is connected to an external supply source, which carries high-pressure steam and electric power from the external supply source to the steamer 110. The composite cable 120 may include a line transferring high-pressure steam (for example, a hose, a pipe, or the like) and a line transferring electric power (for example, a cable or the like).

[0044] In an example embodiment, the high-pressure steamer module 100 may include a reel 130 on which the composite cable 120 is wound. In an example embodiment, the reel 130 may include a post provided in a rotational axis direction, and an outer peripheral surface of the post becomes a cable-seating surface. The composite cable 120 may be configured to be wound on the cable-seating surface. Specifically, the post of the reel 130 may be, in particular, a cylinder, and an outer circumferential surface of the cylinder may be the cable-seating surface. This has an advantage of winding a cable more smoothly than a post with a polygonal cross-section. In an example embodiment, the reel 130 may include a side wall configured in the form of a wall extending from the cable-seating surface in a direction perpendicular to a rotational axis of the reel 130. This has an advantage of not leaving the composite cable 120 wound on the cable-seating surface out of the reel 130.

[0045] In an example embodiment, the high-pressure steamer module 100 may include a case 140 in which the steamer 110, the composite cable 120, and the reel 130 are stored. Alternatively, the case 140 may also be configured to store the composite cable 120 and the reel 130 alone. The case 140 may be fabricated with hard materials such as plastic and metal and be fabricated to protect the steamer 110, the composite cable 120, or the reel 130 stored in the case 140 against breakage.

[0046] In an example embodiment, the case 140 may include a partition wall that partitions the case 140 off, and the steamer 110 may be stored in one space among spaces within the case 140 partitioned off by the partition wall and the composite cable 120 and the reel 130 may be stored in another space. This has an advantage in that a problem of the composite cable 120 being twisted when the steamer 110 is stored in the same space as the composite cable 120 or the reel 130 may be prevented.

[0047] In an example embodiment, the case 140 may include a structure to be coupled to another apparatus or module. For example, the case 140 may include a corresponding structure or an engaging part in order to be assembled on a rail of a steam generator module 150. In this case, there is an advantage in that a more close-packed structure may be formed as the case 140 is coupled to the steam generator module 150. It is apparent to those skilled in the art that a structure may be included where the case 140 may be coupled to other various apparatuses or modules, not limited to the steam generator module 150.

[0048] In an example embodiment, the high-pressure steamer module 100 may further include the steam generator module 150 that generates high-pressure steam. The steam generator module 150 may include a frame 151 and a steam generator 152. The steam generator 152 may heat water, generate high-pressure steam, and then supply high-pressure steam to the steamer 110 through the composite cable 120. The frame 151 may store an accessory or the like which may be included in the steam generator module 150. For example, the frame 151 may store a high-pressure pump for carrying water. Further, in an example embodiment, the frame 151 may include an engaging structure to be mutually assembled on the case 140. This, as described above, has an advantage in that a more close-packed structure may be formed as the case 140 is coupled to the frame 151 of the steam generator module 150.

[0049] FIG. 2 illustrates an example embodiment in which a composite cable 220 is wound on a reel 230 according to an example embodiment of the present disclosure. In an example embodiment, the composite cable 220 may include a first partial composite cable 221 toward a steamer and a second partial composite cable 222 toward an external supply source which are partitioned off based on a first point 223 on the composite cable 220. An end of the first partial composite cable 221 may be connected to the steamer. An end of the second partial composite cable 222 may be connected to the external supply source. Since the first point 223 is merely any position or area on the composite cable 220, the composite cable 220 is not physically cut into the first partial composite cable 221 and the second partial composite cable 222 based on the first point 223.

[0050] In an example embodiment, the reel 230 may include a first storage part 231 on which the first partial composite cable 221 is wound and stored, a second storage part 232 on which the second partial composite cable 222 is wound and stored, and a guide part 233 which fixes the first point 223. The first storage part 231 may be configured to wind an entire or a portion of the first partial composite cable 221. When the first storage part 231 rotates, the first partial composite cable 221 may be wound on the first storage part 231 or unwound from the first storage part 231. Similarly, when the second storage part 232 rotates, the second partial composite cable 222 may be wound on the second storage part 232 or unwound from the second storage part 232.

[0051] In an example embodiment, the first storage part 231 may include a side wall configured in the form of a wall extending from a cable-seating surface of the first storage part 231 in a direction perpendicular to a rotational axis of the reel 230. This has an advantage of

not leaving the composite cable 220 wound on the cable-seating surface out of the first storage part 231. In an example embodiment, the second storage part 232 may include a side wall configured in the form of a wall extending from a cable-seating surface of the second storage part 232 in the direction perpendicular to the rotational axis of the reel 230. This has an advantage of not leaving the composite cable 220 wound on the cable-seating surface out of the second storage part 232. The first storage part 231 and the second storage part 232 may mutually share a side wall or may have separate side walls. The first storage part 231 and the second storage part 232 shown in FIG. 2 have separate side walls. This structure has an advantage of helping the first partial composite cable 221 and the second partial composite cable 222 not intertwined with one another while wound on or unwound from the first storage part 231 and the second storage part 232, respectively.

[0052] In order for a user to wind the composite cable 220 wound on the reel 230, when the reel 230 rotates in a specific direction, the composite cable 220 may be unwound from the reel 230. For example, a high-pressure steamer module may be configured such that, when the reel 230 rotates in a first rotation direction, the first partial composite cable 221 is unwound from the first storage part 231 of the reel 230. In this case, the user may pull the steamer out farther from the reel 230 to use. In the above example, when the reel 230 rotates in the first rotation direction, the second partial composite cable 222 may be configured to be wound on the second storage part 232 of the reel 230. However, in this case, unnecessary tension may be applied to the second partial composite cable 222 connected toward the external supply source due to the winding of the second partial composite cable 222. Therefore, preferably, when the reel 230 rotates in the first rotation direction, the second partial composite cable 222 may be configured to be unwound from the second storage part 232 of the reel 230. In this case, it may be understood that, when the reel 230 rotates in the first rotation direction, the first partial composite cable 221 and the second partial composite cable 222 are unwound from the first storage part 231 and the second storage part 232, respectively. In the same example, the high-pressure steamer module may be configured such that, when the reel 230 rotates in an opposite direction to the first rotation direction, the first partial composite cable 221 is wound on the first storage part 231 of the reel 230, and simultaneously, the second partial composite cable 222 is wound on the second storage part 232. In this case, the user may rotate the reel 230 in the opposite direction to the first rotation direction to wind and store the composite cable 220 on the reel 230.

[0053] As in the example described above, in order that the first partial composite cable 221 and the second partial composite cable 222 are unwound from the first storage part 231 and the second storage part 232 respectively when the reel 230 is rotated in the first rotation direction and the first partial composite cable 221 and the second partial composite cable 222 are wound on the first storage part 231 and the second storage part 232 respectively when the reel 230 is rotated in the opposite direction to the first rotation direction, in an example embodiment, a first winding direction of the first partial composite cable 221 and a second winding direction of the second partial composite cable 222 may be identical, and a guide part 233 may guide the composite cable 220 to turn around at the first point 223. For example, as illustrated in FIG. 2, the first partial composite cable 221 may be wound on the cable-seating surface of the first storage part 231 in a right direction of the reel 230 starting from the first point 223, and the second partial composite cable 222 may also be wound on the cable-seating surface of the second storage part 232 in the right direction of the reel 230 starting from the first point 223. Here, "the right direction" is no more than an example, and the first partial composite cable 221 and the second partial composite cable 222 may also be wound on the cable-seating surfaces of the first storage part 231 and the second storage part 232, respectively, in a left direction of the reel 230 starting from the first point 223.

[0054] FIG. 3 illustrates an example embodiment of a composite cable 321 and 322 and a guide part 333 according to an example embodiment of the present disclosure. In an example embodiment, the guide part 333 may be provided on one side of a cable-seating surface of a reel 330 to form a "U"-shaped path, and both ends of the path may be provided to face one direction perpendicular to a rotational axis of the reel 330. For example, the guide part 333 may include guide walls 334, 335, 336, and 337 with a form protruding from one side of the cable-seating surface of the reel 330. The composite cable 321 and 322 may be bent and guided to form the "U"-shaped path by the guide walls 334, 335, 336, and 337. As described in FIG. 2, this has an effect of being guided by the guide part 333 so that a first winding direction of the first partial composite cable 321 and a second winding direction of the second partial composite cable 322 are identical.

[0055] In an example embodiment, the guide part 333 may include the first guide wall 334 formed in a first direction parallel to a rotational axis 301 of the reel 330, the second guide wall 335 formed to be perpendicular to the first direction, and the third guide wall 336 formed to be perpendicular to the first direction and formed opposite to the second guide wall 335, and a first point 323 may be positioned to be adjacent to the first guide wall 334, and the first partial composite cable 321 may be guided to be bent along the first guide wall 334 and the second guide wall 335 and wound on a first storage part 331, and the second partial composite cable 322 may be guided to be bent along the first guide wall 334 and the third guide wall 336 and wound on a second storage part 332. The second guide wall 335 and the third guide wall 336 may be formed to be spaced apart by predetermined distances from the first guide wall 334 in a direction perpendicular to the rotational axis 301. This

has an advantage of preventing the composite cable 321 and 322 from breakage as the composite cable 321 and 322 is not excessively bent even though turned around based on the first point 323 when adjacent to the first guide wall 334.

[0056] In an example embodiment, the second guide wall 335 and the third guide wall 336 may have predetermined widths in the direction perpendicular to the rotational axis 301 of the reel 330. That is, a function of securing a straight section may be served when the composite cable 321 and 322 as adjacent to the first guide wall 334 turns around based on the first point 323 to form a "U"-shape. This has an advantage of the composite cable 321 and 322 transferring fluid more smoothly in a turning-around section.

[0057] In an example embodiment of FIG. 3, although the second guide wall 335 and the third guide wall 336 are illustrated to be parallel to each other and have identical widths in the direction perpendicular to the rotational axis 301, this is no more than an example, and the second guide wall 335 and the third guide wall 336 may be configured to be not parallel to each other when needed and may also be configured not to have identical widths in the direction perpendicular to the rotational axis 301.

[0058] In an example embodiment, the guide part 333 may include the fourth guide wall 337 formed opposite to the first guide wall 334. The fourth guide wall 337 may function to prevent the composite cable 321 and 322 hung on the first guide wall 334 from being left out to an opposite side of the first guide wall 334. Accordingly, preferably, a distance between the first guide wall 334 and the fourth guide wall 337 may be similar to or slightly greater than the thickness of the composite cable 321 and 322.

[0059] In an example embodiment, the fourth guide wall 337 may include a " square bracket([)"-shaped wall surface of which opposite ends are bent. The twisted opposite ends of the fourth guide wall 337 may help the composite cable 321 and 322 maintain the "U"-shape by restricting the composite cable 321 and 322.

[0060] FIG. 4 illustrates an example embodiment of a composite cable 421 and 422 and a guide part 433 according to an example embodiment of the present disclosure. In an example embodiment, a reel 430 may further include an engaging part 438 formed in a protrusion form on a cable-seating surface of the reel 430 and a cover 439 engaged with the engaging part 438 and configured to cover a portion of the composite cable 421 and 422 so that the composite cable 421 and 422 is not left out of the cable-seating surface and the guide part 433. Specifically, the cover 439 may cover the vicinity of a first point which is a boundary between the first partial composite cable 421 and the second partial composite cable 422 so that the first partial composite cable 421 and the second partial composite cable 422 are not left out of a first storage part 431 and a second storage part 432 respectively.

[0061] In an example embodiment, the engaging part 438 may have any forms, well known in the art, in which the cover 439 may be fixed to the engaging part 438. For example, as a thread groove is formed in a protrusion of the engaging part 438 and a bolt (also with a washer when needed) is engaged onto the cover 439, the cover 439 may be fixed to the engaging part 438. For another example, as a structure is formed in which the engaging part 438 may be assembled on a corresponding position of the cover 439 in a fitting form, the engaging part 438 may be configured in a manner in which the cover 439 is pushed and fitted in the engaging part 438 with no separate parts.

[0062] In an example embodiment, the engaging part 438 may be one, but to fix stably the cover 439, the reel 430 may include a plurality of engaging parts 438, or preferably three or more engaging parts 438 as illustrated in FIG. 4. This has an advantage of preventing the cover 439 from leaving out or breakage.

[0063] In an example embodiment, the protrusion of the engaging part 438 may have a predetermined height from the cable-seating surface of the reel 430. When the plurality of engaging parts 438 are provided, the plurality of engaging parts 438 may have different heights and the cover 439 may also have a corresponding form in order to be engaged with the plurality of engaging parts 438. Meanwhile, in another example embodiment, the cover 439 may have a plane plate form, and the plurality of engaging parts 438 may also have all identical heights. This has an advantage of more convenient fabrication and a simpler structure of the engaging part 438 and the cover 439.

[0064] In an example embodiment, the protrusion of the engaging part 438 may be higher than the composite cable 421 and 422 and guide walls 435, 436, and 437 of the guide part 433 in height. However, preferably, for the composite cable 421 and 422 not to be left out above the guide walls 435, 436, and 437, the protrusion of the engaging part 438 may be similar to the composite cable 421 and 422 and guide walls 435, 436, and 437 of the guide part 433 in height.

[0065] FIG. 5 illustrates an example embodiment of a composite cable 520 according to an example embodiment of the present disclosure. In an example embodiment, the composite cable 520 may include a first sheath 521 that forms a path of high-pressure steam, a second sheath 522 that forms a path of electric power transmission, and a third sheath 523 that surrounds the first sheath 521 and the second sheath 522, and the third sheath 523 may be provided excluding an area 524 where the composite cable 520 turns around. This has an advantage of helping the composite cable 520 be well bent as the third sheath 523 of the area 524 where the composite cable 520 turns around or is bent is removed when it is difficult for the composite cable 520 to be bent by a small radius of curvature since the composite cable 520 includes multiple layers of sheaths such as the first sheath 521, the second sheath 522, and the third sheath 523.

[0066] In an example embodiment, the composite cable 520 may further include more sheath when needed, in addition to the first sheath 521, the second sheath 522, and the third sheath 523 illustrated in FIG. 5. For example, the composite cable 520 may further include a fourth sheath that forms a path of electrical signal transmission.

[0067] In an example embodiment, the second sheath 522 may be provided excluding an area where the composite cable 520 turns around. This has an advantage of helping the composite cable 520 be well bent when it is difficult for the composite cable 520 to be bent by a smaller radius of curvature since the second sheath 522 is thick.

[0068] FIG. 6 illustrates an example embodiment of a high-pressure steamer module according to an example embodiment of the present disclosure. In an example embodiment, a case 640 may include a partition wall 643 that partitions the case 640 into a first space 641 and a second space 642, and a first storage part is positioned in the first space 641, and a second storage part is positioned in the second space 642. The partition wall 643 may be positioned between the first storage part and the second storage part. This has an advantage of preventing a composite cable 620 from being wound on the second storage part or other parts of a reel 630 even if the composite cable 620 wound the first storage part is unwound and left out of the reel 630 temporarily. This is similar even for the composite cable 620 wound on the second storage part.

[0069] In an example embodiment, the case 640 may further include a hollow 644, provided on an outer wall of the case 640, through which a second partial composite cable 622 passes and a holder installed around the hollow 644 and configured to limit movement in a length direction of the second partial composite cable 622 for the second partial composite cable 622 passing through the hollow 644 not to additionally come out of the case 640 or additionally go into the case 640. For example, the holder may include a hollow with a similar diameter to the second partial composite cable 622 so that the second partial composite cable 622 may be barely fitted. For another example, the holder may include a clamp with which the second partial composite cable 622 may be fixed. For another example, the second partial composite cable 622 may include a bracket fixed on the cable, and the holder may have a form in which the bracket is assembled and fixed thereon. The shape of the holder is not limited to the descriptions above and may include any shapes, apparent to those skilled in the art, in order for the second partial composite cable 622 to be fixed.

[0070] FIG. 7 illustrates an example embodiment of a high-pressure steamer module according to an example embodiment of the present disclosure. In an example embodiment, the high-pressure steamer module may further include a steam generator module 750 that generates high-pressure steam, and the steam generator module 750 may include a frame 751. The steam generator module 750 may include a steam generator 752. The frame 751 may help components inside the frame 751 be close-packed and may perform a role of protecting the components inside the frame 751 against external impacts. The frame 751 may store an accessory (for example, a high-pressure pump or the like) that may be added to the high-pressure steamer module or the steam generator 752. In addition, the accessory, the steam generator 752, or a composite cable 720 connected to other external supply sources may be stored in the frame 751 or may pass through the frame 751. To prevent the composite cable 720 from being intertwined with other accessories or the steam generator 752 inside the frame 751, the steam generator module 750 in an example embodiment may include a cable passage 753, formed along a wall surface on an inner side of the frame 751, through which the composite cable 720 passes.

[0071] Although FIG. 7 illustrates that the cable passage 753 is formed along a wall surface on an inner side of the frame 751, a position where the cable passage 753 is formed is not limited thereto. For example, the cable passage 753 may be formed along a wall surface on an outer side of the frame. For another example, the cable passage 753 may not be formed along a wall surface of the frame but may be formed to be spaced apart from a wall surface of the frame and to traverse an internal space of the frame.

[0072] FIG. 8 illustrates an example embodiment of a high-pressure steamer module according to an example embodiment of the present disclosure. Since an internal space of a case 840 may be small, the case 840 may include a winding direction change part that may change a winding direction of a composite cable 820 by bending the composite cable 820. Specifically, in an example embodiment, the case 840 may further include a fixed shaft 847 of which opposite ends are fixed to a first side wall 845 of the case 840 and a second side wall 846 of the case 840 which is opposite to the first side wall 845 of the case and a roller case 848 that surrounds an outer circumferential surface of the fixed shaft 847 and is rotatable based on the fixed shaft 847, and the roller case 848 may bend the composite cable 820 in a circumferential direction of an outer circumferential surface of the roller case 848 and change a winding direction of the composite cable 820. Although one pair alone of the fixed shaft 847 and the roller case 848 is illustrated in FIG. 8, the present disclosure is not limited thereto, and it is apparent to those skilled in the art that the case 840 may include a plurality of pairs of the fixed shaft 847 and the roller case 848 when needed.

[0073] A user may rotate a reel of a high-pressure steamer module to pull out separately and use a steamer from the high-pressure steamer module. Accordingly, in an example embodiment, the high-pressure steamer module may be provided with a handle or the like with which a user may rotate the reel. In another example embodiment, the high-pressure steamer module may include an automatic reel winding structure which is

known in the art. For example, the high-pressure steamer module may include a resilience generation part (for example, a spring or the like) for rotating and restoring the reel and a resistance part (for example, a ratchet or the like) for preventing the reel from being restored while the steamer is used. In another example embodiment, the high-pressure steamer module may include an automatic reel winding and unwinding structure using an actuator. FIG. 9 illustrates this example embodiment of a high-pressure steamer module according to an example embodiment of the present disclosure. The high-pressure steamer module may include a power shaft 960 fitted in a reel 930 to share a rotational axis with the reel 930 and configured to transmit rotation power to the reel 930, a bearing 970, fixed to a first side wall 945 of a case, which supports the power shaft 960, and an actuator 980 fixed to a second side wall 946 of the case, which is opposite to the first side wall 945 of the case, and configured to rotate the power shaft 960 to wind or unwind a composite cable on or from the reel 930. This has an advantage of making it more convenient for a user to wind or unwind a composite cable on or from a reel.

[0074] The bearing 970 supports the power shaft 960 so that the power shaft may rotate with a little friction within the case. The bearing 970 may be provided to be in contact with an outer circumferential surface of an end portion toward the first side wall 945 of the power shaft 960.

[0075] The actuator 980 may be provided in a space toward the second side wall 946 within the case. The actuator 980 may be a motor, and a rotational axis of the actuator 980 may be positioned perpendicular to a rotational axis direction of the reel 930 to minimize a size in which the device occupies in the rotational axis direction of the reel 930.

[0076] In this case, a decelerator 981 may decelerate and transfer the torque of the actuator 980 to the power shaft 960 and simultaneously may also perform a role of changing a direction of torque application. Further, the decelerator 981 may increase the torque of the actuator 980 and transmits it to the power shaft 960 so that sufficient power may be applied to wind or unwind the reel 930. The decelerator 981 may have a shape of a gearbox in which a plurality of gears are mounted. The decelerator 981 may use decelerating manners known in the art, such as a worm gear type, a spur gear type, a bevel gear type, a helical gear type, a planetary gear type, and a belt driving type.

[0077] For the actuator 980 and the decelerator 981 to be mounted, the reel 930 may be positioned to one side based on a length direction of the rotational axis of the reel 930 within the case.

[0078] The decelerator 981 and the bearing 970 may support the power shaft 960. In the high-pressure steamer module 100, the rotational axis of the reel 930 may be recommended to be positioned parallel to a ground surface. In this case, by applying a gravity load generated due to a configuration including the reel 930 and the power shaft 960 to the decelerator 981 and the bearing 970, an external force that interrupts the rotation of the reel 930 may be generated least.

[0079] In a specific example embodiment, the power shaft 960 may include a cross-section in a polygonal shape. For example, the power shaft 960 may include a quadrangle-shaped cross-section. The reel 930 may include a polygon-shaped hollow corresponding to the rotational axis thereof. The power shaft 960 may be fitted to the rotational axis hollow of the reel 930 to transmit rotation power to the reel 930. This has an advantage of transmitting rotation power while the power shaft 960 not slipping in the rotational axis hollow of the reel 930 better, compared to a case of the power shaft 960 with a circle-shaped cross-section.

[0080] FIG. 10 shows a steamer 1010 according to an example embodiment of the present disclosure. In an example embodiment, a high-pressure steamer module may further include a user input device 1090 that operates an actuator to wind or unwind a composite cable on or from a reel in response to a user input. The user input device 1090 may include a first button 1091 and a second button 1092. For example, when a user presses the first button 1091, the actuator may rotate the reel in a first direction and unwind the composite cable from the reel, and when a user presses the second button 1092, the actuator may rotate the reel in a second direction and wind the composite cable on the reel. Although FIG. 10 illustrates a button type of the user input device 1090, the present disclosure is not limited thereto, and the high-pressure steamer module may include the user input device 1090 using user input manners known in the art. For example, the user input device 1090 may include a lever. When a user pushes up the lever, the actuator may rotate the reel in the first direction and unwind the composite cable from the reel, and when a user pulls down the lever, the actuator may rotate the reel in the second direction and wind the composite cable on the reel. For another example, the user input device 1090 may include a trigger. When a user pushes the trigger forward, the actuator may rotate the reel in the first direction and unwind the composite cable from the reel, and when a user pulls the trigger backward, the actuator may rotate the reel in the second direction and wind the composite cable on the reel.

[0081] A user may spray steam on a cloth while holding the steamer 1010 in hand to manage the cloth. Accordingly, in a specific example embodiment, the user input device 1090 may be provided in a handle 1011 of the steamer 1010. This has an advantage of enabling a user to manipulate a steamer with one hand alone. For example, the user input device 1090 may be provided near a position of a thumb of a user when the user holds the handle 1011 in hand. The user may manipulate the buttons 1091 and 1092, the lever, or the trigger of the user input device 1090 by thumb. A position of the user input device 1090 is not limited to the position shown in FIG. 10. For another example, the user input device 1090

may be provided near a position of a forefinger of a user when the user holds the handle 1011 in hand. The user may manipulate the buttons 1091 and 1092, the lever, or the trigger of the user input device 1090 by forefinger.

[0082] FIG. 11 illustrates an example embodiment of a clothing treating apparatus 10 including a high-pressure steamer module 1100 according to an example embodiment of the present disclosure.

[0083] In an example embodiment, the clothing treating apparatus 10 may include a cabinet 11 of which a front 12 is opened and inside which an accommodation space is formed, a door 14 configured to open and close the cabinet 11, a cabinet partition wall 16 configured to partition the accommodation space into a clothing accommodation space 13 and a parts accommodation space 15, and the high-pressure steamer module 1100 positioned in the parts accommodation space 15.

[0084] The clothing treating apparatus 10 may treat clothing 50 introduced into the clothing accommodation space 13. Specifically, the clothing treating apparatus 10 may prevent clothing from deformation or change by temperature or humidity by controlling temperatures or humidity around the clothing 50 introduced into the clothing accommodation space 13 of the cabinet 11. For example, the clothing treating apparatus 10 may include a heating measure (a heater and the like) or a cooling measure (a fan and the like) in order to control temperatures around the clothing 50 introduced into the clothing accommodation space 13 (preferably, hung on a hanging measure 17 within the clothing accommodation space 13 using a hanger and the like). In addition, for example, the clothing treating apparatus 10 may include a humidity control measure in order to control humidity around the clothing 50 introduced into the clothing accommodation space 13. For example, the clothing treating apparatus 10 may supply steam to the clothing accommodation space 13 or recover steam from the clothing accommodation space 13. Specifically, the parts accommodation space 15 of the clothing treating apparatus 10 may be provided with a water supply part that stores water to be provided as steam to the clothing accommodation space 13 and a recovery part that recovers steam from the clothing accommodation space 13 to store. The water supply part or the recovery part may be provided in a drawer form in the parts accommodation space 15 to be inserted into the parts accommodation space 15 or withdrawn from the parts accommodation space 15.

[0085] In the cabinet partition wall 16, an air circulation opening 18 may be formed. Air or steam treated in the parts accommodation space 15 (treated to control temperatures or humidity around the clothing 50 introduced into the clothing accommodation space 13) may flow into the clothing accommodation space 13 of the cabinet 11 through the air circulation opening 18 or, alternatively, air or steam of the clothing accommodation space 13 may flow into the parts accommodation space 15 of the cabinet 11 through the air circulation opening 18 for treatment. In the cabinet partition wall 16, one or more air circulation openings 18 may be provided. Some of the air circulation openings 18 may be an air inlet for air or steam to flow from the clothing accommodation space 13 to the parts accommodation space 15 or an air outlet for air or steam to flow from the parts accommodation space 15 to the clothing accommodation space 13. In the air circulation opening 18, a filter may be positioned to filter foreign substances from air or steam passing through the air circulation opening 18.

[0086] In an example embodiment, the high-pressure steamer module 1100 may be positioned in the parts accommodation space 15. Specifically, the high-pressure steamer module 1100 or a case 1140 may be provided in a drawer form to be inserted into the parts accommodation space 15 or withdrawn from the parts accommodation space 15. For example, the high-pressure steamer module 1100 may further include a rail (identical or similar to a rail 154 shown in FIG. 1), and the case 1140 may be assembled on the rail to be movable along the rail, and the case 1140 may be guided by the rail to enter and exit the parts accommodation space 15. As an example, the rail, as the rail 154 shown in FIG. 1, may be provided in a steam generator module (identical or similar to the steam generator module 150 shown in FIG. 1) of the high-pressure steamer module 1100 or a frame of the steam generator module (identical or similar to the frame 151 shown in FIG. 1). However, a position and a direction of the rail are not limited thereto. For example, the rail may also be provided on a wall surface or a bottom of the parts accommodation space 15. For another example, the high-pressure steamer module 1100 or the case 1140 may also be inserted into the parts accommodation space 15 or withdrawn from the parts accommodation space 15 without a separate rail.

[0087] In an example embodiment, to make it easier for the high-pressure steamer module 1100 or the case 1140 to be inserted or withdrawn, a handle 1149 (identical or similar to a handle 149 of FIG. 1) may be provided in the case 1140. A user may pull the handle 1149 and withdraw the high-pressure steamer module 1100 or the case 1140 from the parts accommodation space 15 to use a steamer 1110.

[0088] In an example embodiment, the clothing treating apparatus 10 may further include a hook 21 or 22 at an upper portion of the front 12 of the cabinet 11 or an upper portion of an inner surface of the door 14 in order for clothing to hang. A user may hang the clothing 50 on the hook 21 or 22 using a hanger and the like to use the high-pressure steamer module 1100.

[0089] In an example embodiment, the clothing treating apparatus 10 may further include a shelf 23 inside the cabinet 11. A user may put clothing or the like on the shelf 23 to use the high-pressure steamer module 1100. The shelf 23 may be assembled on the cabinet 11 in order to be withdrawn from the cabinet 11.

[0090] Hereinafter, a use example of the high-pressure steamer module 1100 is described with reference to FIG. 11. A user may hang the clothing 50 on the hook 21 or 22

using a hanger and the like or put the clothing 50 on the shelf 23. Then, the user may pull the handle 1149 to withdraw the high-pressure steamer module 1100 or the case 1140 from the parts accommodation space 15. Also then, the user may withdraw the steamer 1110 from the case 1140 (for example, the user may pull out the steamer 1110 or manipulate a withdrawal button of the steamer 1110). In this case, in order for the steamer 1110 to spray steam evenly onto the clothing 50 hung on the hook 21 or 22, a cable or a composite cable 1120 may be wound from the case 1140 by a suitable length. The user may spray steam on the clothing 50 by pressing a steam spraying button provided on the steamer 1110. When spraying steam is completed, the user may insert the steamer 1110 and the cable 1120 inside the case 1140 (for example, the user may push in the steamer 1110 or manipulate an insertion button of the steamer 1110). Lastly, the user may push the high-pressure steamer module 1100 or the case 1140 to insert the high-pressure steamer module 1100 or the case 1140 inside the parts accommodation space 15.

Claims

1. A high-pressure steamer module comprising:

a steamer;
a composite cable of which one end is connected to the steamer and another end is connected to an external supply source, which is configured to carry high-pressure steam and electric power from the external supply source to the steamer;
a reel on which the composite cable is wound;
a case in which the steamer, the composite cable, and the reel are stored;
a power shaft fitted in the reel to share a rotational axis with the reel and configured to transmit rotation power to the reel; and
an actuator configured to rotate the power shaft to wind or unwind the composite cable on or from the reel.

2. The high-pressure steamer module of claim 1,

wherein the composite cable includes a first partial composite cable toward the steamer and a second partial composite cable toward the external supply source which are partitioned off based on a first point on the composite cable, and
wherein the reel includes:

a first storage part on which the first partial composite cable is wound and stored;
a second storage part on which the second partial composite cable is wound and stored; and
a guide part configured to fix the first point.

3. The high-pressure steamer module of claim 2,

wherein a first winding direction of the first partial composite cable and a second winding direction of the second partial composite cable are identical, and
wherein the guide part is configured to guide the composite cable to turn around at the first point.

4. The high-pressure steamer module of claim 2, wherein the guide part is provided on one side of a cable-seating surface of the reel to form a "U"-shaped path, and both ends of the path are provided to face one direction perpendicular to a rotational axis of the reel.

5. The high-pressure steamer module of claim 2, wherein the guide part includes:

a first guide wall formed in a first direction parallel to a rotational axis of the reel;
a second guide wall formed to be perpendicular to the first direction; and
a third guide wall formed to be perpendicular to the first direction and formed opposite to the second guide wall,
wherein the first point is positioned to be adjacent to the first guide wall,
wherein the first partial composite cable is guided to be bent along the first guide wall and the second guide wall and wound on the first storage part, and
wherein the second partial composite cable is guided to be bent along the first guide wall and the third guide wall and wound on the second storage part.

6. The high-pressure steamer module of claim 5, wherein the reel further includes:

an engaging part formed in a protrusion form on a cable-seating surface of the reel; and
a cover engaged with the engaging part and configured to cover a portion of the composite cable so that the composite cable is not left out of the cable-seating surface and the guide part.

7. The high-pressure steamer module of claim 1, wherein the composite cable includes:

a first sheath that forms a path of high-pressure steam;
a second sheath that forms a path of electric power transmission; and
a third sheath that surrounds the first sheath and the second sheath, and

wherein the third sheath is provided excluding an area where the composite cable turns around.

8. The high-pressure steamer module of claim 2, wherein the case includes a partition wall configured to partition the case into a first space and a second space, and the first storage part is positioned in the first space, and the second storage part is positioned in the second space.

9. The high-pressure steamer module of claim 2, wherein the case further includes:

a hollow, provided on an outer wall of the case, through which the second partial composite cable passes; and
a holder installed around the hollow and configured to limit movement in a length direction of the second partial composite cable for the second partial composite cable passing through the hollow not to additionally come out of the case or additionally go into the case.

10. The high-pressure steamer module of claim 1,

further comprising a steam generator module configured to generate high-pressure steam, wherein the steam generator module includes:

a frame; and
a cable passage, formed along a wall surface on an inner side of the frame, through which the composite cable passes.

11. The high-pressure steamer module of claim 1, wherein the case further includes:

a fixed shaft of which opposite ends are fixed to a first side wall of the case and a second side wall of the case which is opposite to the first side wall of the case; and
a roller case configured to surround an outer circumferential surface of the fixed shaft and to be rotatable based on the fixed shaft, and
wherein the roller case is configured to bend the composite cable in a circumferential direction of an outer circumferential surface of the roller case and change a winding direction of the composite cable.

12. The high-pressure steamer module of claim 1, wherein the power shaft includes a cross-section in a polygonal shape.

13. The high-pressure steamer module of claim 1, wherein the actuator includes a decelerator.

14. The high-pressure steamer module of claim 1, further comprising a user input device configured to operate the actuator to wind or unwind the composite cable on or from the reel in response to a user input.

15. The high-pressure steamer module of claim 14, wherein the user input device is provided on a handle of the steamer.

16. A clothing treating apparatus comprising:

a cabinet of which a front is opened and inside which an accommodation space is formed;
a door configured to open and close the cabinet;
a cabinet partition wall configured to partition the accommodation space into a clothing accommodation space and a parts accommodation space; and
a high-pressure steamer module positioned in the parts accommodation space.

17. The clothing treating apparatus of claim 16, wherein the high-pressure steamer includes:

a steamer;
a composite cable of which one end is connected to the steamer and another end is connected to an external supply source, which is configured to carry high-pressure steam and electric power from the external supply source to the steamer;
a reel on which the composite cable is wound;
a case in which the steamer, the composite cable, and the reel are stored;
a power shaft fitted in the reel to share a rotational axis with the reel and configured to transmit rotation power to the reel; and an actuator configured to rotate the power shaft to wind or unwind the composite cable on or from the reel.

18. The clothing treating apparatus of claim 17,

wherein the high-pressure steamer module further includes a rail, wherein the case is assembled on the rail to be movable along the rail, and
wherein the case is guided by the rail to be suitable for entering and exiting the parts accommodation space.

19. The clothing treating apparatus of claim 17, further comprising a hook at an upper portion of the front of the cabinet or an upper portion of an inner surface of the door in order for clothing to hang.

20. The clothing treating apparatus of claim 17, further comprising a shelf inside the cabinet.

21. The clothing treating apparatus of claim 17, wherein the parts accommodation space is provided with:

a water supply part configured to store water to be provided as steam to the clothing accommodation space; and
a recovery part configured to recover steam from the clothing accommodation space to store.

FIG. 1

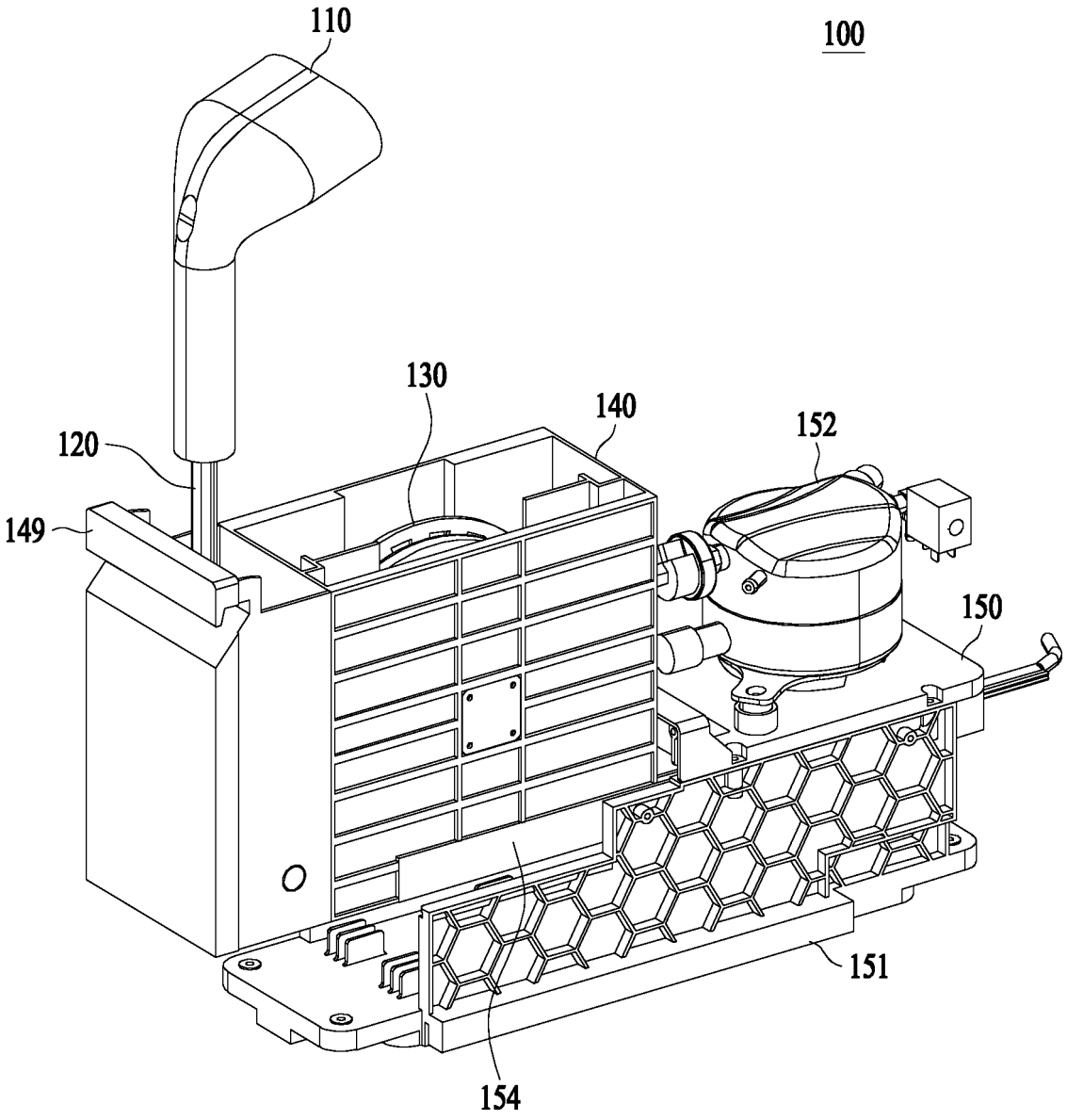


FIG. 2

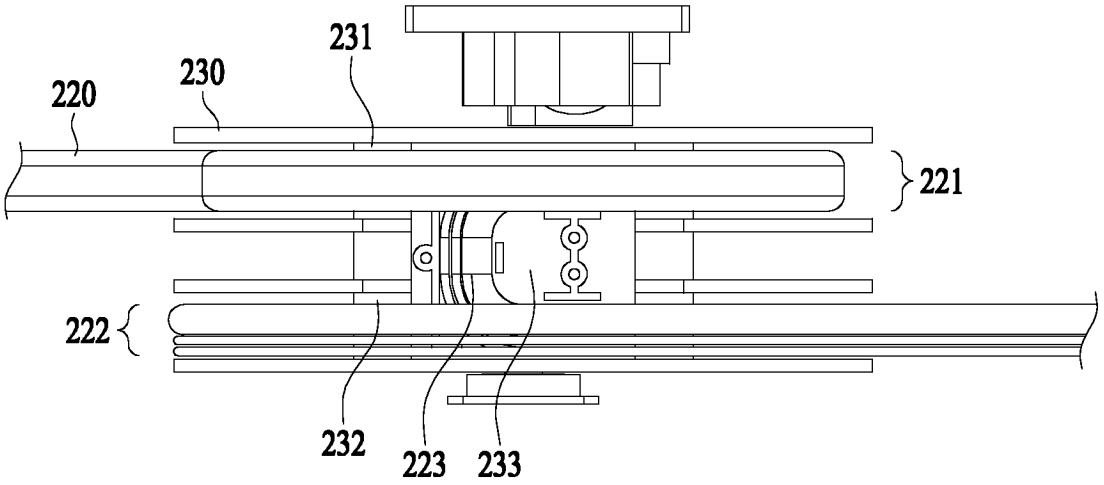


FIG. 3

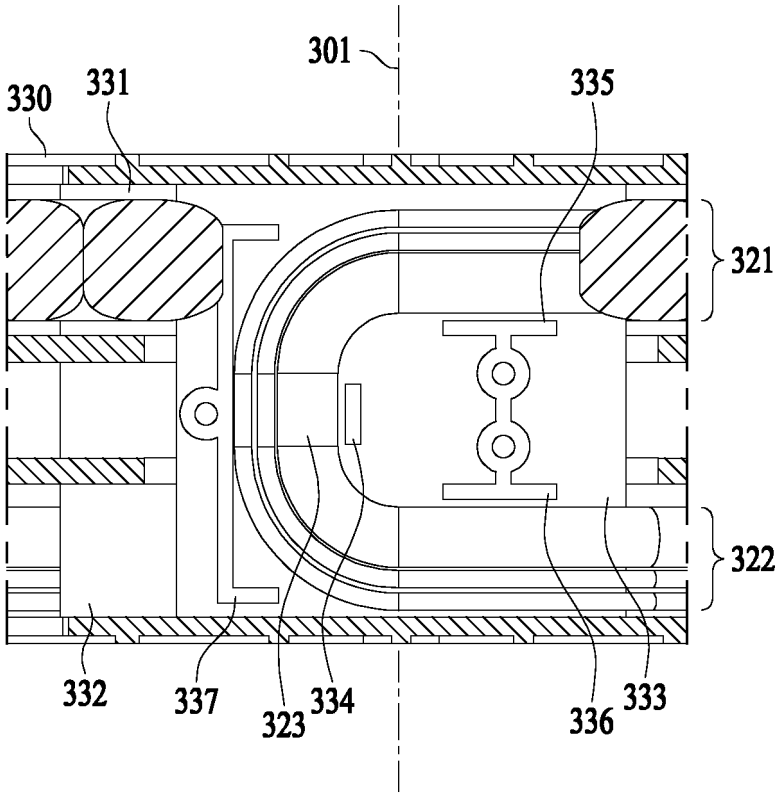


FIG. 4

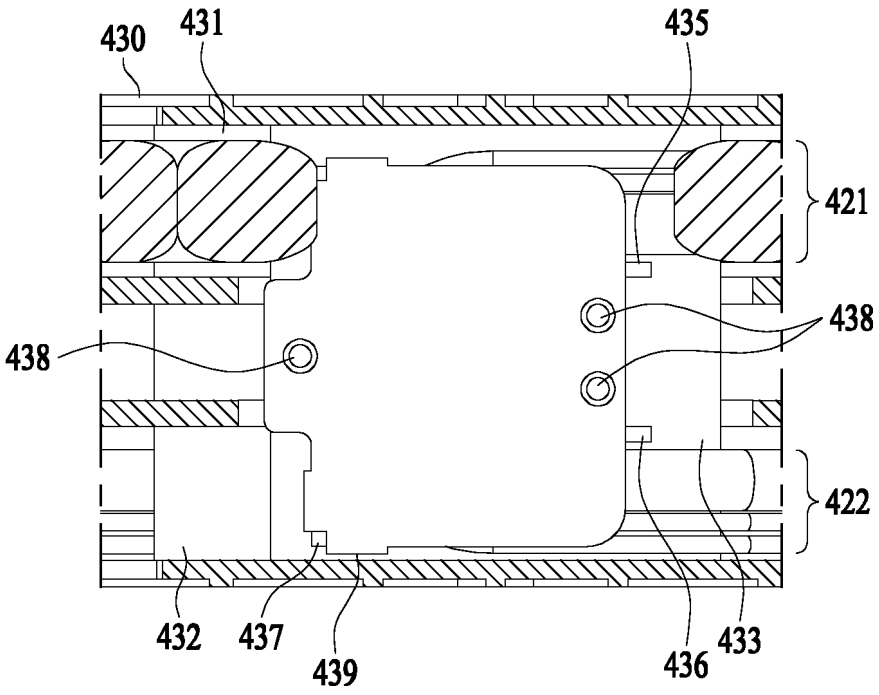


FIG. 5

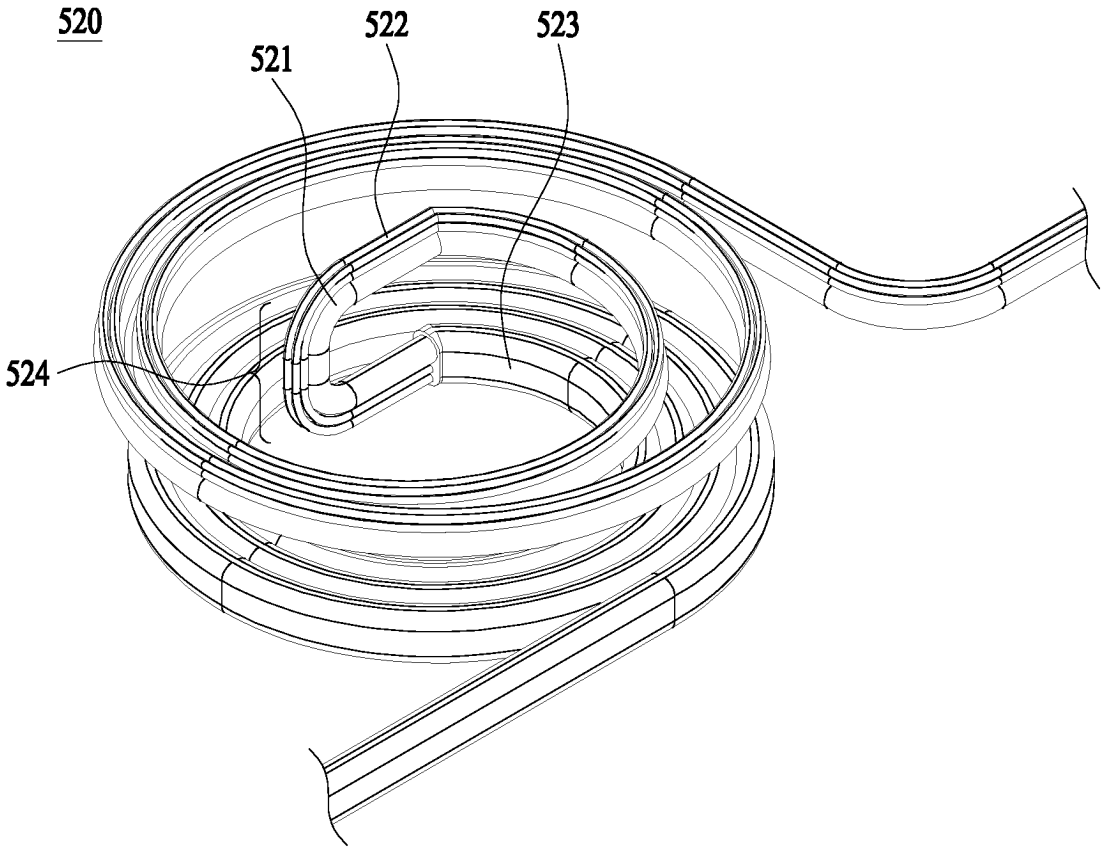


FIG. 6

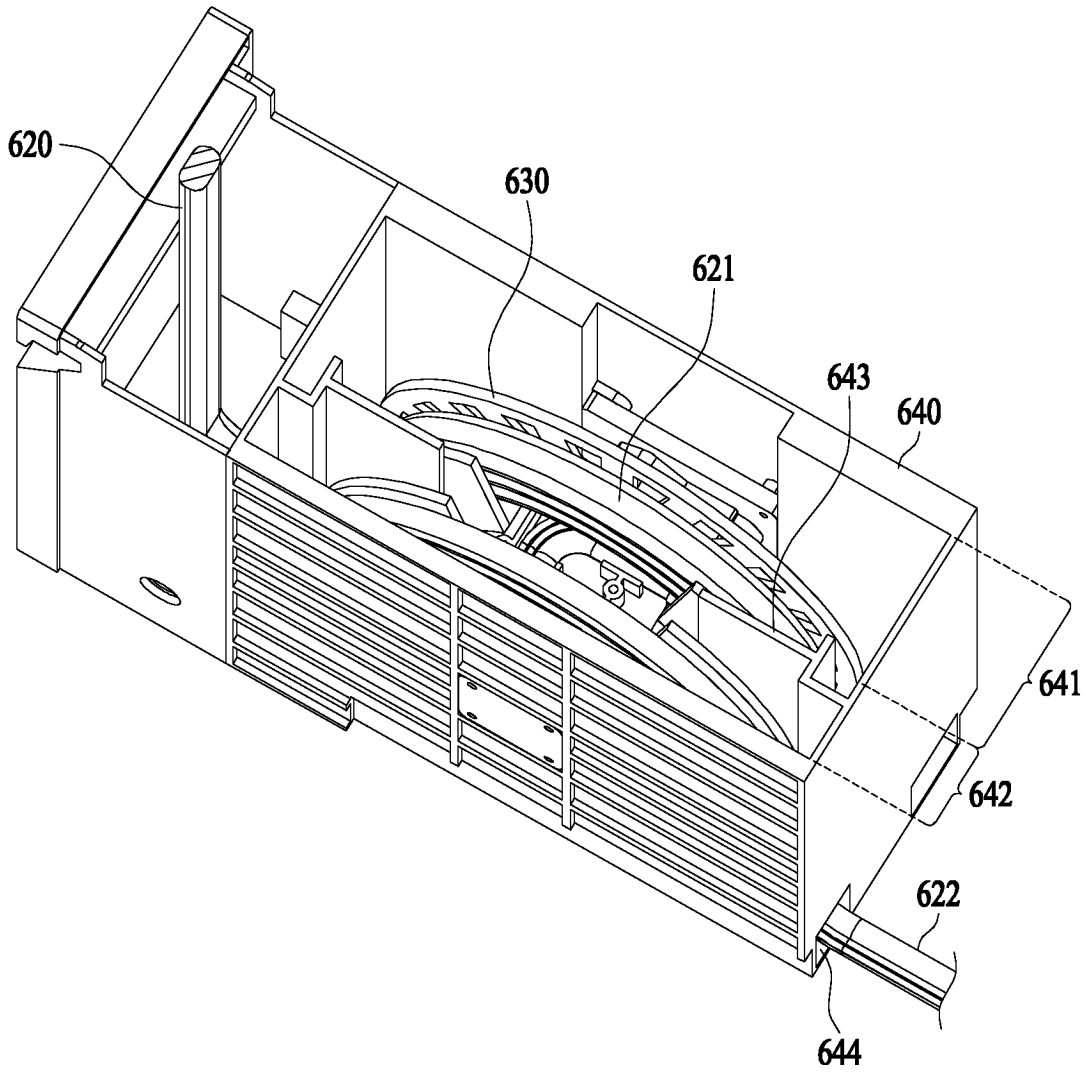


FIG. 7

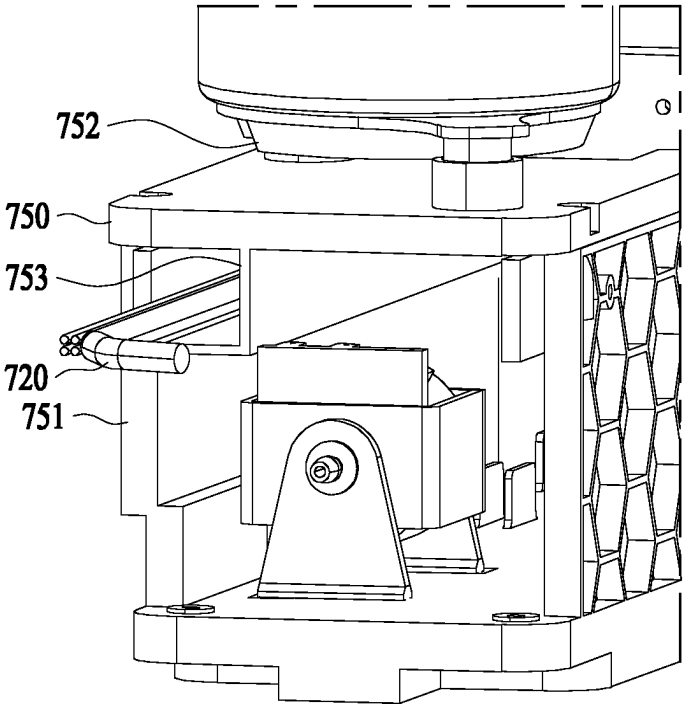


FIG. 8

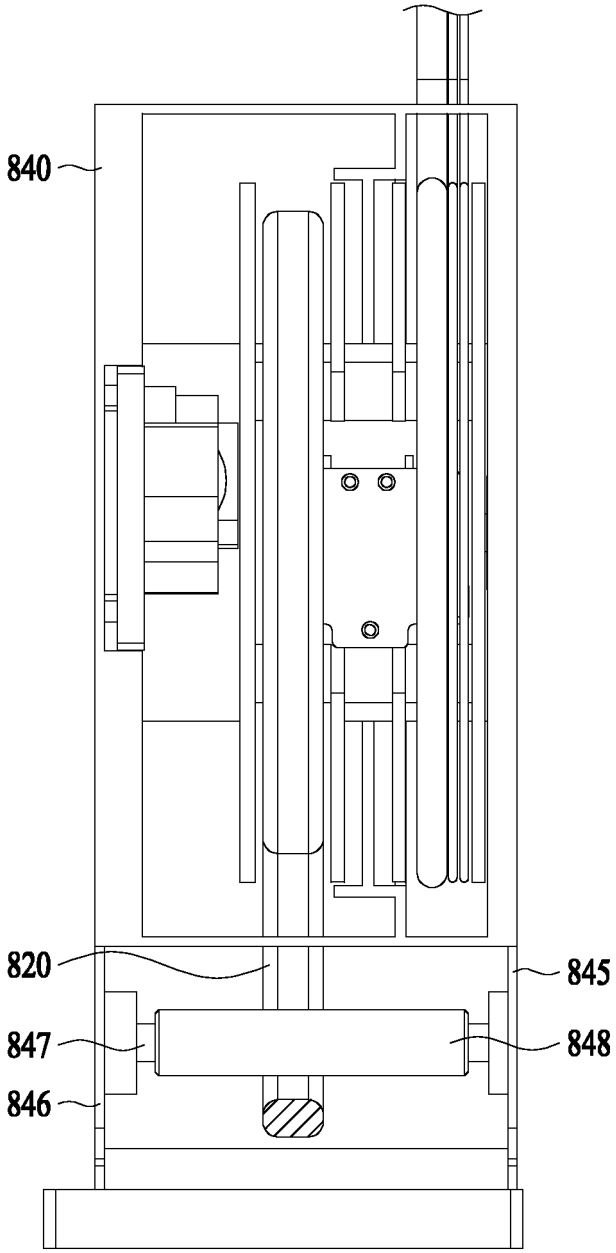


FIG. 9

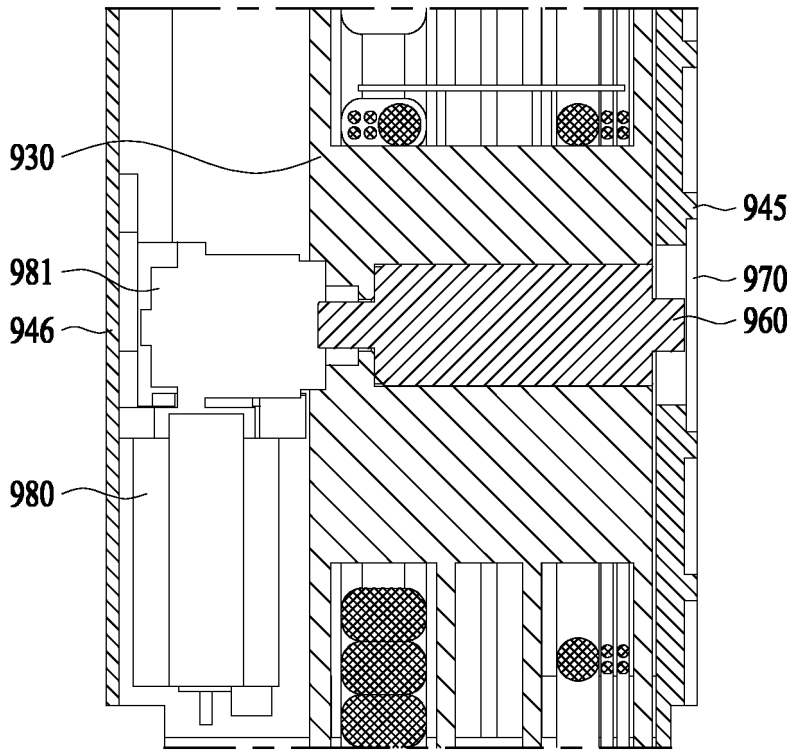


FIG. 10

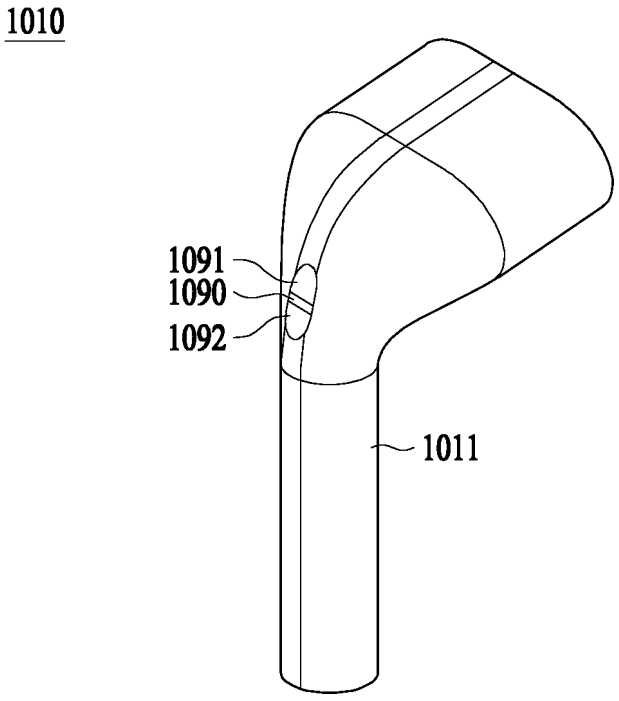
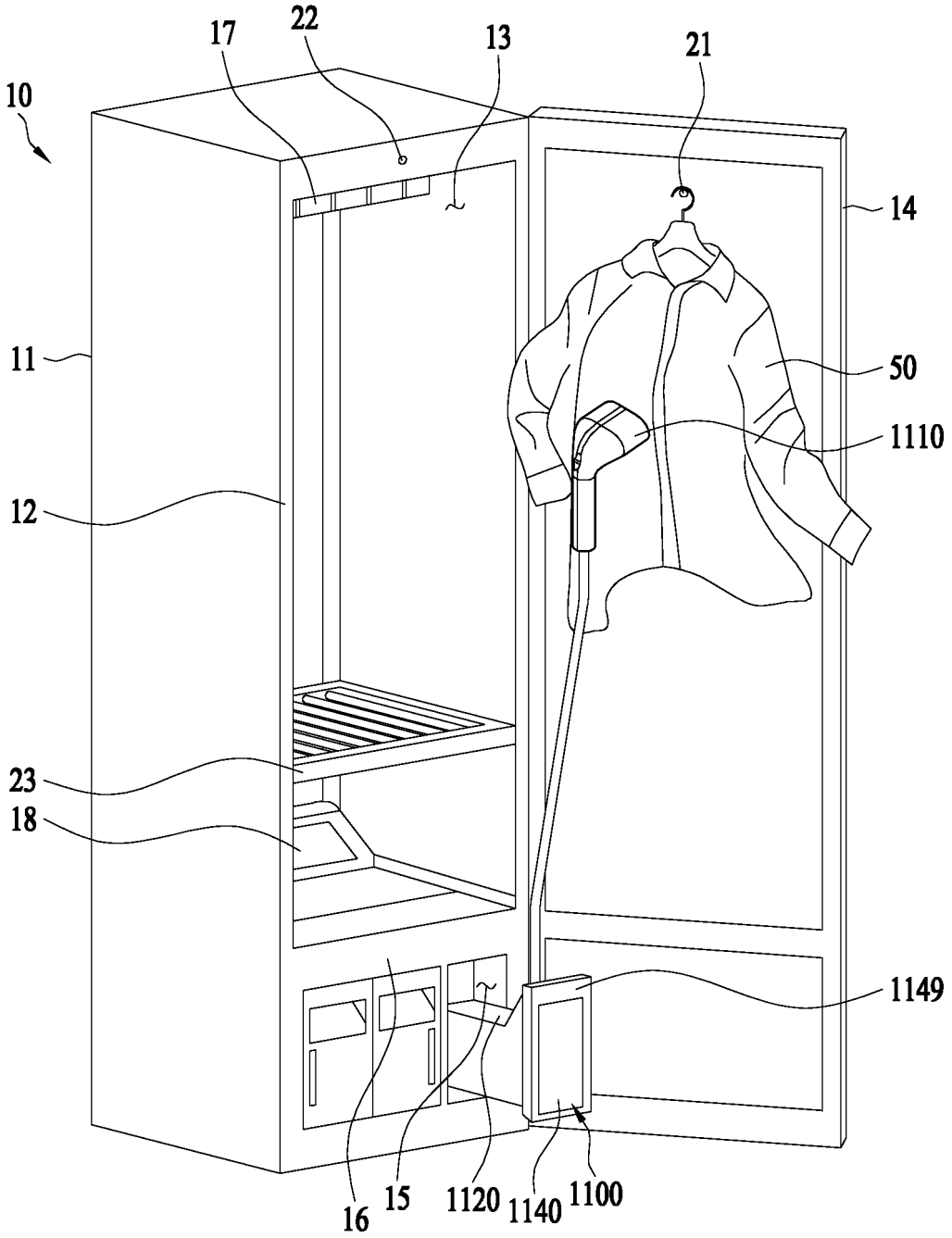


FIG. 11



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2023/006606

A. CLASSIFICATION OF SUBJECT MATTER

D06F 75/28(2006.01)i; **D06F 75/20**(2006.01)i; **D06F 75/34**(2006.01)i; **D06F 58/12**(2006.01)i; **D06F 58/44**(2020.01)i; **D06F 58/20**(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)

D06F 75/28(2006.01); D06F 58/12(2006.01); D06F 58/26(2006.01); D06F 73/00(2006.01); D06F 75/00(2006.01); D06F 75/06(2006.01); D06F 75/20(2006.01); D06F 87/00(2006.01)

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

Korean utility models and applications for utility models: IPC as above
Japanese utility models and applications for utility models: IPC as above

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

eKOMPASS (KIPO internal) & keywords: 고압 스티머 모듈(high-pressure steamer module), 스티머(steamer), 복합케이블(hybrid cable), 전력(power), 릴(reel), 샤프트(shaft), 회전(rotation), 의류(clothes)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 6435343 B2 (CONAIR CORPORATION) 05 December 2018 (2018-12-05) See paragraphs [0011]-[0013], [0018]-[0022] and [0030]; claim 1; and figures 1-5, 12-16C and 28.	1,7,10-15,17-21
A		2-6,8-9,16
Y	JP 2000-107497 A (CHIAPHUA IND. LTD.) 18 April 2000 (2000-04-18) See paragraphs [0010]-[0011]; and figure 1.	1,7,10-15,17-21
X	KR 10-2020-0028185 A (LG ELECTRONICS INC.) 16 March 2020 (2020-03-16) See paragraphs [0021]-[0023], [0036], [0060]-[0081] and [0085]-[0088]; and figures 1-2 and 5-9.	16
Y		17-21
A	US 2008-0209774 A1 (ROBIN, Jean Philippe) 04 September 2008 (2008-09-04) See paragraphs [0031]-[0040]; and figures 1-5b.	1-21

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

* Special categories of cited documents:
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"D" document cited by the applicant in the international application
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Date of the actual completion of the international search	Date of mailing of the international search report
17 August 2023	**17 August 2023**

Name and mailing address of the ISA/KR	Authorized officer
Korean Intellectual Property Office **Government Complex-Daejeon Building 4, 189 Cheongsa-ro, Seo-gu, Daejeon 35208**	
Facsimile No. **+82-42-481-8578**	Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2023/006606

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2023/006606

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