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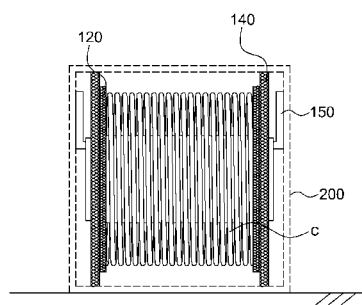
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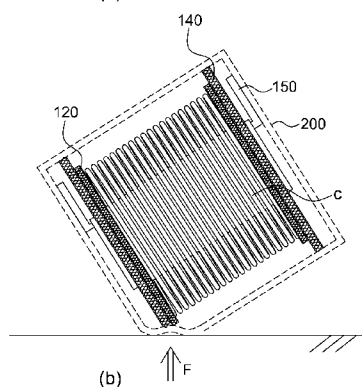
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(54) Title: CABLE BOBBIN ASSEMBLY



(a)



(b)

(57) Abstract: The present invention relate to a cable bobbin assembly capable of maintaining sufficient hardness even and thus faithfully maintaining original functions when an external shock is applied thereto although it is formed of a paper material for an eco-friendly purpose.



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Description

Title of Invention: CABLE BOBBIN ASSEMBLY

Technical Field

- [1] The present invention relate to a cable bobbin assembly, and more particularly to, a cable bobbin assembly capable of maintaining sufficient hardness even and thus faithfully maintaining original functions when an external shock is applied thereto although it is formed of a paper material for an eco-friendly purpose.

Background Art

- [2] A general cable, the diameter of which is not large, e.g., a communication cable or a power cable, is accommodated in a packing box in a state in which it is wound on a bobbin member assembly and is then provided to a client. A bobbin member of the cable bobbin assembly may be configured to be rotatable inside the packing box, so that an operator may build a communication network or a power network by pulling out the cable from the packing box without opening the packing box during cable installation for building the communication network or the power network.
- [3] The bobbin member on which the cable is wound and the like may be rotatably accommodated in the packing box to prevent the cable from being twisted inside the packing box during the building of the communication network or the power network. Furthermore, the bobbin member, a support frame supporting the bobbin member, etc. are generally formed of a plastic material so that the cable may be pulled out from the packing box formed of a paper material without being much rubbed.
- [4] However, when the bobbin member, the support frame, etc. are formed of a plastic material, environmental pollution and a problem caused by wastes may occur. Thus, a method of forming all of inner elements (such as the bobbin member for winding a cable) or the packing box of a paper material may be taken into account.
- [5] Recently, as described in U.S. Patent No. 9,446,928, a cable bobbin assembly made of paper has been proposed. But when all of the inner elements such as the bobbin member for winding a cable or the packing box are formed of a paper material, the inner elements such as the bobbin member (which are formed of a plastic material in the related art) may have insufficient hardness. Thus, the inner elements contained in the packing box may be crushed or deformed due to external shocks, etc.
- [6] When such a problem occurs, the bobbin member rotatably accommodated in the packing box to pull out a cable and the like may become non-rotatable or the cable may be much robbed and damaged when the cable is pulled out.

Disclosure of Invention

Technical Problem

- [7] Technical problem of the the present invention relate to a cable bobbin assembly, and more particularly to, a cable bobbin assembly capable of maintaining sufficient hardness even and thus faithfully maintaining original functions when an external shock is applied thereto although it is formed of a paper material for an eco-friendly purpose.

Solution to Problem

- [8] The present invention is directed to a cable bobbin assembly capable of mainlining sufficient hardness and thus faithfully mainlining original functions even when an external shock is applied thereto, although it is formed of a paper material for an eco-friendly purpose.
- [9] To achieve these objects, the present invention provides a cable bobbin assembly comprising a bobbin member which has a circular pipe shape and on which a cable is wound, a pair of side flanges fixed on both ends of the bobbin member, a pair of flange holders configured to fix the pair of side flanges on the bobbin member, a pair of side support members configured to rotatably support the pair of flange holders and a separation-prevention member arranged to pass through the bobbin member having the pair of flange holders thereon in a state in which the pair of side flanges are interposed between the bobbin member and the pair of flange holders, and configured to prevent the pair of flange holders from being separated from the pair of side support members, wherein the bobbin member, the pair of side flanges, the pair of flange holders, the pair of side support members, and the separation-prevention member are each formed of a paper material.
- [10] And the pair of side flanges each may have a disc shape with a through-hole which one of the pair of flange holders passes through, and each of the pair of flange holders may comprise an insertion part configured to be inserted into the bobbin member, and a rotation part forming a step with the insertion part, and configured to be rotatably inserted into one of installation holes formed in the pair of side support members in a state in which the pair of side flanges are interposed between the bobbin member and the pair of flange holders.
- [11] And the separation-prevention member may prevent the rotation parts of the pair of flange holders from being separated from the installation holes of the pair of side support members due to an external shock, in a state in which a cable is wound on the bobbin member, the rotation parts of the pair of flange holders are installed in the installation holes of the pair of side support members, and the cable bobbin assembly is accommodated in a packing box.
- [12] And the separation-prevention member may be formed of a paper strip longer than a length of the bobbin member in which the pair of flange holders are mounted on the

both ends thereof, wherein parts of the separation-prevention member exposed to the outside of the rotation parts of the pair of flange holders mounted on the both ends of the bobbin member are bent in a direction opposite to a direction in which the cable bobbin assembly is accommodated in the packing box during the accommodating of the cable bobbin assembly in the packing box and are thus located between the packing box and the pair of side support members.

[13] And the separation-prevention member may have a width which is less than an internal diameter of the bobbin member.

[14] And the pair of side support members may have a tetragonal shape, and each may comprise a grip hole formed as a handle in a long hole shape.

[15] And at least one among the pair of side flanges, the pair of side support members, and the separation-prevention member may be formed of corrugated cardboard, wherein the corrugated cardboard may comprises a corrugating medium in which a valley and a peak are arranged repeatedly and alternatively and a linear attached onto opposite sides of the corrugating medium.

[16] And the corrugated cardboard may be a multi-layer corrugated cardboard in which the corrugated medium is formed in multiple layers.

[17] And the corrugated cardboard may be used in a compressed form.

[18] And the pair of side support members may be formed by stacking a plurality of sheets of corrugated cardboard.

[19] And the pair of side support members may have a width corresponding to that of a packing box for packing the cable bobbin assembly.

Advantageous Effects of Invention

[20] A cable bobbin assembly according to an embodiment of the present invention is formed of paper and can thus be manufactured at lower costs and be eco-friendly.

[21] Since all of the elements of the cable bobbin assembly according to an embodiment of the present invention are formed of paper, the volume of wastes generated at a site where a work of building a communication network or a power network is performed may be minimized, thereby improving a working environment.

[22] Furthermore, although all of the elements of the cable bobbin assembly according to an embodiment of the present invention are formed of paper, the cable bobbin assembly may have sufficient hardness to safely store a cable therein and allow working convenience to be maintained.

Brief Description of Drawings

[23] FIG. 1 is a diagram illustrating a packing box for a cable bobbin assembly and an inner core of the cable bobbin assembly on which a communication cable is wound, according to an embodiment of the present invention.

- [24] FIG. 2 is a perspective view of a cable bobbin assembly according to an embodiment of the present invention.
- [25] FIG. 3 is an exploded perspective view of a cable bobbin assembly according to an embodiment of the present invention.
- [26] FIG. 4 illustrates a process of mounting a separation-prevention member on a cable bobbin assembly according to an embodiment of the present invention.
- [27] FIG. 5 illustrates a state in which a cable bobbin assembly according to an embodiment of the present invention is accommodated in a packing box, and a state in which the cable bobbin assembly is fallen in the state it is accommodated in the packing box.
- [28] FIG. 6 is a perspective view illustrating a state in which a cable bobbin assembly according to an embodiment of the present invention is packed.

Best Mode for Carrying out the Invention

- [29] Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the accompanying drawings. The present invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and fully convey the scope of the invention to those skilled in the art. Throughout the specification, the same reference numbers may be used to denote similar components in various embodiments.
- [30] FIG. 1 is a diagram illustrating a cable bobbin assembly 100 and a packing box 200 according to an embodiment of the present invention.
- [31] A communication cable or a power cable is accommodated in the packing box 20 in a state in which it is wound on the cable bobbin assembly 100, and is then provided to a user. A bobbin member on which a cable(c) is wound may be configured to be rotatable inside the packing box 200, so that an operator who performs a work of building a communication network or a power network may build the communication network or the power network by pulling out the cable from a cable discharge opening 210 formed in the packing box 200 without opening the packing box 200 during cable installation for building the communication network or the power network.
- [32] For example, when a work of building a communication network or a power network in a data center or a large building is performed, a large amount of the cable bobbin assembly is consumed and thus the amount of wastes after the work increases. Thus, when all of inner elements of the cable bobbin assembly 100 according to an embodiment of the present invention may be formed of a paper material, the cable bobbin assembly 100 is eco-friendly and wastes may be easily disposed of.
- [33] It is easy to recycle or dispose of wastes when all of elements of the cable bobbin

assembly 100 according to an embodiment of the present invention are formed of paper, unlike a cable bobbin assembly according to the related art. However, when the cable is to be smoothly pulled out or is carried or stored, the bobbin member may be separated from the cable bobbin assembly 100 due to an external shock and thus the cable may not be easily pulled out from the packing box 200 or the like.

[34] In detail, when stacked packing boxes are fallen or heavy load or shock is applied thereto during storing or carrying of a large amount of cable bobbin assemblies 100 formed of paper, the shock may be also applied to the inside of the packing boxes and the inner elements of the cable bobbin assembly 100 may be crushed or damaged due to the shock. When the inner elements of the cable bobbin assembly 100 are crushed or damaged, smoothly pulling out of the cable by means of rotation of the bobbin member rotatably mounted inside the cable bobbin assembly 100 may not be expected.

[35] Thus, the whole cable bobbin assembly 100 is formed of paper and includes elements capable of preventing it from being deformed when an external shock is applied thereto, so that the cable bobbin assembly 100 according to an embodiment of the present invention may be eco-friendly and secure hardness against external shocks. The cable bobbin assembly 100 according to an embodiment of the present invention will be described in detail with reference to FIG. 2, etc.

[36] FIG. 2 is a perspective view of the cable bobbin assembly 100 according to an embodiment of the present invention. FIG. 3 is an exploded perspective view of the cable bobbin assembly 100 according to an embodiment of the present invention.

[37] The cable bobbin assembly 100 according to an embodiment of the present invention includes a bobbin member 110 which has a circular pipe shape and on which a communication cable is wound, a pair of side flanges 120 fixed on both ends of the bobbin member 110, a pair of flange holders 130 configured to fix the pair of side flanges 120 on the bobbin member 110, a pair of side support members 140 supporting the pair of flange holders 130 to be rotatable, and a separation-prevention member 150 arranged to pass through the bobbin member 110 having the pair of flange holders 130 thereon in a state in which the pair of side flanges 120 are interposed between the bobbin member 110 and the pair of flange holders 130, and configured to prevent the pair of flange holders 130 from being separated from the pair of side support members 140. The bobbin member 110, the pair of side flanges 120, the pair of flange holders 130, the pair of side support members 140, and the separation-prevention member 150 may be each formed of a paper material.

[38] The cable bobbin assembly 100 of FIG. 2 according to an embodiment of the present invention has a structure in which the bobbin member 110 and the pair of side flanges 120 are fixed on one another and are rotatably supported by the pair of side support members 140 in a state in which a communication cable is wound on the bobbin

member 110.

- [39] As illustrated in FIG. 3, the bobbin member 110 on which the communication cable is wound has a hollow circular pipe shape, and the pair of side flanges 120 are installed and fixed on the both ends of the bobbin member 110.
- [40] The pair of side flanges 120 may be installed and fixed on the bobbin member 110 by means of the pair of flange holders 130.
- [41] In detail, the pair of side flanges 120 may each have a disk shape with a through-hole 121 through which one of the pair of flange holders 130 may pass. The pair of flange holders 130 may be configured to be installed and fixed on the bobbin member 110, having the pair of side flanges 120 therebetween.
- [42] The pair of flange holders 130 may serve axes of rotation allowing the bobbin member 110 to be rotatably mounted on the pair of side support members 140 while fixing the bobbin member 110 and the pair of side flanges 120.
- [43] In detail, as illustrated in FIG. 3, each of the pair of flange holders 130 may include an insertion part 131 configured to be inserted into the bobbin member 110, and a rotation part 136 forming a step with the insertion part 131, supporting one of the pair of side flanges 120 in a state in which the pair of side flanges 120 are interposed between the bobbin member 110 and the pair of flange holders 130, and rotatably installed in one of installation holes 141 of the pair of side support members 140.
- [44] The bobbin member 110 and the pair of flange holders 130 are adhered to one another via an adhesive as will be described below. Thus, the insertion parts 131 of the pair of flange holders 130 may be set to have an external diameter corresponding to an internal diameter of the bobbin member 110, so that external surfaces of the insertion parts 131 and internal surfaces of the bobbin member 110 may be in close contact with each other.
- [45] Furthermore, the insertion part 131 and the rotation part 136 of each of the pair of flange holders 130 form a step, so that the pair of side flanges 120 may be supported by the step. In order to limit a depth to which the insertion parts 131 are inserted into the bobbin member 110, the rotation parts 136 of the pair of flange holders 130 may have external diameters greater than those of the pair of flange holders 130.
- [46] In order to form the flange holder 130 of paper, a shorter outer pipe member having a larger diameter may be fixed on an outer circumference surface of a longer inner pipe member via an adhesive or the like. That is, the rotation part 136 of the flange holder 130 may be manufactured by mounting, on an outer circumference surface of an inner pipe member, an outer pipe member which has an internal diameter corresponding to an external diameter of the inner pipe member and which is shorter than the inner pipe member. Thus, an end part of the outer pipe member may form a step.
- [47] Furthermore, when the pair of flange holders 130 are mounted on the bobbin member

110, having the pair of side flanges 120 therebetween as illustrated in FIG. 3, the pair of flange holders 130, the pair of side flanges 120, and the bobbin member 110 may be fixed by applying an adhesive onto side surfaces of the insertion parts 131 and the steps.

[48] When an operator pulls out the cable from the packing box 200, the pair of flange holders 130, the pair of side flanges 120, and the bobbin member 110 may be rotated together in a state in which the rotation parts 136 of the pair of flange holders 130 are inserted into and supported by the installation holes 141 of the pair of side support members 140.

[49] Furthermore, although the pair of side flanges 120 are adhered using the adhesive, the diameters of the through-holes 121 of the pair of side flanges 120 may be set to correspond to the external diameters of the insertion parts 131 of the pair of flange holders 130 by taking into account an assembled state of the pair of side flanges 120, stability of an adhered state thereof, etc.

[50] A stopping part 126 may be formed on inner circumference surfaces of the through-holes 121 of the pair of side flanges 120 to prevent a communication cable from sagging when the communication cable is initially wound on the bobbin member 110, so that an initial wound state of the communication cable may be maintained.

[51] The stopping part 126 is obtained by cutting a portion of the through-hole 121 of the side flange 120 to a size such that an end part (a front end) of a cable may pass through the stopping part 126. The stopping part 126 may have a small hole shape in a state in which the side flange 120 is fixed between the flange holder 130 and the bobbin member 110.

[52] Thus, after an end part of a cable is initially inserted into a hole formed by the stopping part 126, the cable may be wound by rotating the bobbin member 110 to prevent the cable from sagging, as illustrated in FIG. 1.

[53] Furthermore, as illustrated in FIG. 3(b), the rotation parts 136 of the pair of flange holders 130 may be rotatably mounted on the pair of side support members 140 in a state in which the bobbin member 110, the pair of side flanges 120, and the pair of flange holders 130 are installed and fixed.

[54] Thus, the pair of side support members 140 may include the installation holes 141 having a round shape, in which the rotation parts 136 of the pair of flange holders 130 may be rotatably installed.

[55] The diameters of the installation holes 141 and the diameters of the rotation parts 131 of the pair of flange holders 130 may be determined to provide a tolerance allowing the rotation parts 136 to be rotatable.

[56] Furthermore, a grip hole 146 having a long hole shape may be formed as a handle in each of the pair of side support members 140 for convenient delivery during packing of

the cable bobbin assembly 100 in the packing box 200 in a state in which a cable is wound on the bobbin member 110 and the rotation parts 136 of the pair of flange holders 130 are respectively mounted in the installation holes 141 of the pair of side support members 140.

- [57] In the cable bobbin assembly 100 fixed or assembled as illustrated in FIG. 3, when the cable wound on the bobbin member 110 is pulled out outside the packing box 200 in a state in which the cable bobbin assembly 100 is accommodated in the packing box 200, the cable may be pulled out from the packing box 200 as the bobbin member 110 fixed with the pair of side flanges 130 and the pair of flange holders 130 is rotated. The bobbin member 110 may be rotated since the rotation parts 136 of the pair of flange holders 130 for mounting the pair of side flanges 120 on the bobbin member 110 are rotatably supported by the installation holes 141 of the pair of side support members 140.
- [58] The pair of side support members 140 have a width corresponding to that of the packing box 200 and thus the cable bobbin assembly 100 may be accommodated in the packing box 200 without being shaken.
- [59] The rotatably installing of the rotation parts 136 of the pair of flange holders 130 in the installation holes 141 of the pair of side support members 140 should be understood to mean that the rotation parts 136 of the pair of flange holders 130 are simply inserted into the installation holes 141 of the pair of side support members 140 rather than being adhered to the installation holes 141 of the pair of side support members 140 via an adhesive or the like.
- [60] Thus, the pair of side support members 140 may have a tetragonal shape and have a width corresponding to that of the packing box 200 to minimize shaking of the internal elements of the cable bobbin assembly 100 in a state in which the product is accommodated in the packing box 200. Furthermore, if the cable bobbin assembly 100 is accommodated in the packing box 200 in a state in which the rotation parts 136 of the pair of flange holders 130 are rotatably inserted into the installation holes 141 of the pair of side support members 140, the cable may be pulled out from the packing box 200 without being much rubbed when the cable is pulled out outside the packing box 200.
- [61] However, when an external shock is applied to the packing box 200 or the packing box 200 is fallen, the rotation parts 136 of the pair of flange holders 130 may be separated from the installation holes 141 of the pair of side support members 140.
- [62] To prevent this problem, according to an embodiment of the present invention, the separation-prevention member 150 is provided to pass through the bobbin member 110 having the pair of flange holders 130 thereon and prevent the pair of flange holders 130 from being separated from the pair of side support members 140, in a state in

which the pair of side flanges 130 are interposed between the bobbin member 110 and the pair of flange holders 130.

[63] FIG. 4 illustrates a process of mounting the separation-prevention member 140 on the cable bobbin assembly 199 according to an embodiment of the present invention.

[64] The separation-prevention member 150 may be provided to prevent the rotation parts 136 of the pair of flange holders 130 from being separated from the installation holes 141 of the pair of side support members 140 due to an external shock, in a state in which a cable c is wound on the bobbin member 110, the rotation parts 136 of the pair of flange holders 130 are mounted in the installation holes 141 of the pair of side support members 140, and the cable bobbin assembly 100 is accommodated in the packing box 200.

[65] In detail, the separation-prevention member 150 may be formed of a paper strip longer than the length of the bobbin member 110 in which the pair of flange holders 130 are mounted on the both ends thereof.

[66] As illustrated in FIG. 4(a), when the separation-prevention member 150 having a long strip shape is arranged to pass through the pair of flange holders 130 and the bobbin member 110, both ends of the separation-prevention member 150 protrude to the outside of the rotation parts 136 of the bobbin member 110 as illustrated in FIG. 4(b).

[67] FIG. 5 illustrates a state in which the cable bobbin assembly 100 according to an embodiment of the present invention is accommodated in the packing box 200, and a state in which the cable bobbin assembly 100 is fallen in the state it is accommodated in the packing box 200.

[68] As illustrated in FIG. 5(a), when the cable bobbin assembly 100 is accommodated in the packing box 200 in a state in which the separation-prevention member 150 is arranged to pass through the pair of flange holders 130 and the bobbin member 110 as illustrated in FIG. 4(b), parts of the separation-prevention member 150 exposed to the outside of the rotation parts 136 of the pair of flange holders 130 mounted on the both ends of the bobbin member 110 are bent in a direction opposite to a direction in which the cable bobbin assembly 100 is accommodated into the packing box 200 during the accommodating of the cable bobbin assembly 100 into the packing box 200. Thus, the exposed parts of the separation-prevention member 150 are located between the packing box 200 and the pair of side support members 140 to be wedged between the packing box 20 and the pair of side support members 140.

[69] As described above, when both ends of the separation-prevention member 150 are bent and located between the pair of side support members 140 and the packing box 200, the both ends of the separation-prevention member 150 are wedged by the pair of side support members 140 and the packing box 200.

- [70] Thus, as illustrated in FIG. 5(b), if an external shock is applied to the packing box 200, e.g., when the packing box 200 is fallen, the both ends of the separation-prevention member 150 may instantaneously fix the rotation parts 136 of the pair of flange holders 130 in the installation holes 141 of the pair of side support members 140 when the rotation parts 136 of the pair of flange holders 130 are about to be separated from the installation holes 141 of the pair of side support members 140.
- [71] This is because the exposed both ends of the separation-prevention member 150 passing through the bobbin member 110 do not interrupt rotation of the pair of flange holders 130 but are capable of blocking movement of the rotation parts 136 of the pair of flange holders 130 to be separated from the pair of side support members 140, since the separation-prevention member 150 is formed of a non-stretchable paper material.
- [72] That is, when an external shock is applied to the packing box 200 in a state in which the separation-prevention member 150 is provided, the freedom of horizontal movement of the bobbin member 110 in which the pair of flange holders 130 are mounted on the both ends thereof may be limited by tension applied by the separation-prevention member 150 formed of a paper material, and thus the rotation parts 136 of the pair of flange holders 130 may be prevented from being separated from the pair of side support members 140 due to the external shock unless the separation-prevention member 150 is broken.
- [73] Accordingly, separation of the rotation parts 136 of the pair of flange holders 130 serving as the axes of rotation from the pair of side support members 140 due to an external shock may be prevented or reduced as illustrated in FIG. 5(b) by simply arranging the separation-prevention member 150 of the cable bobbin assembly 100 as described above to pass through the bobbin member 110.
- [74] FIG. 6 is a perspective view illustrating a state in which the cable bobbin assembly 100 according to an embodiment of the present invention is packed.
- [75] In order to absorb shocks and maintain a form, at least one among the pair of side flanges 120, the pair of side support members 140, and the packing box 200 may be formed of corrugated cardboard including a corrugating medium in which a valley and a peak are arranged repeatedly and alternatively and a liner attached onto opposite sides of the corrugating medium, since the cable bobbin assembly 100 according to an embodiment of the present invention is formed of a paper material.
- [76] The corrugated cardboard has a hollow form and the weight thereof may be thus minimized. The corrugated cardboard may have higher bending resistance and hardness than those of general paper, since the corrugating medium serves as a frame and a buffer and the liner forms surfaces of the corrugated cardboard.
- [77] However, since the bobbin member 110 or the pair of flange holders 130 serve as the axes of rotation, the cable cannot be pulled out from the packing box 200 when the

bobbin member 110 or the pair of flange holders 130 are crushed or deformed. Thus, the bobbin member 110 or the pair of flange holders 130 may be formed of compressed paper obtained by winding paper in multiple layers.

- [78] Furthermore, as illustrated in FIG. 6, the pair of side flanges 120 and the pair of side support members 140 may be formed of corrugated cardboard, and the pair of side flanges 120 may be formed of multi-layer corrugated cardboard having corrugating medium formed in multiple layers. Alternatively, the pair of side support members 140 may be formed by stacking a plurality of sheets of corrugated cardboard.
- [79] Alternatively, the pair of side support members 140 may be formed of multi-layer corrugated cardboard or the pair of side flanges 120 may be formed of a plurality of sheets of corrugated cardboard.
- [80] When corrugated cardboard is compressed, the thickness of the corrugated cardboard decreases and the hardness thereof increases. Thus, the corrugated cardboard may be used in a compressed form.
- [81] A cable bobbin assembly according to an embodiment of the present invention is formed of paper and can thus be manufactured at lower costs and be eco-friendly.
- [82] Since all of the elements of the cable bobbin assembly according to an embodiment of the present invention are formed of paper, the volume of wastes generated at a site where a work of building a communication network or a power network is performed may be minimized, thereby improving a working environment.
- [83] Furthermore, although all of the elements of the cable bobbin assembly according to an embodiment of the present invention are formed of paper, the cable bobbin assembly may have sufficient hardness to safely store a cable therein and allow working convenience to be maintained.
- [84] Although the present invention has been described above with reference to the exemplary embodiments thereof, it would be understood by those skilled in the art that various changes and modifications may be made without departing from the technical conception and essential features of the present invention. Thus, it is clear that all modifications are included in the technical scope of the present invention as long as they include the components as claimed in the claims of the present invention.

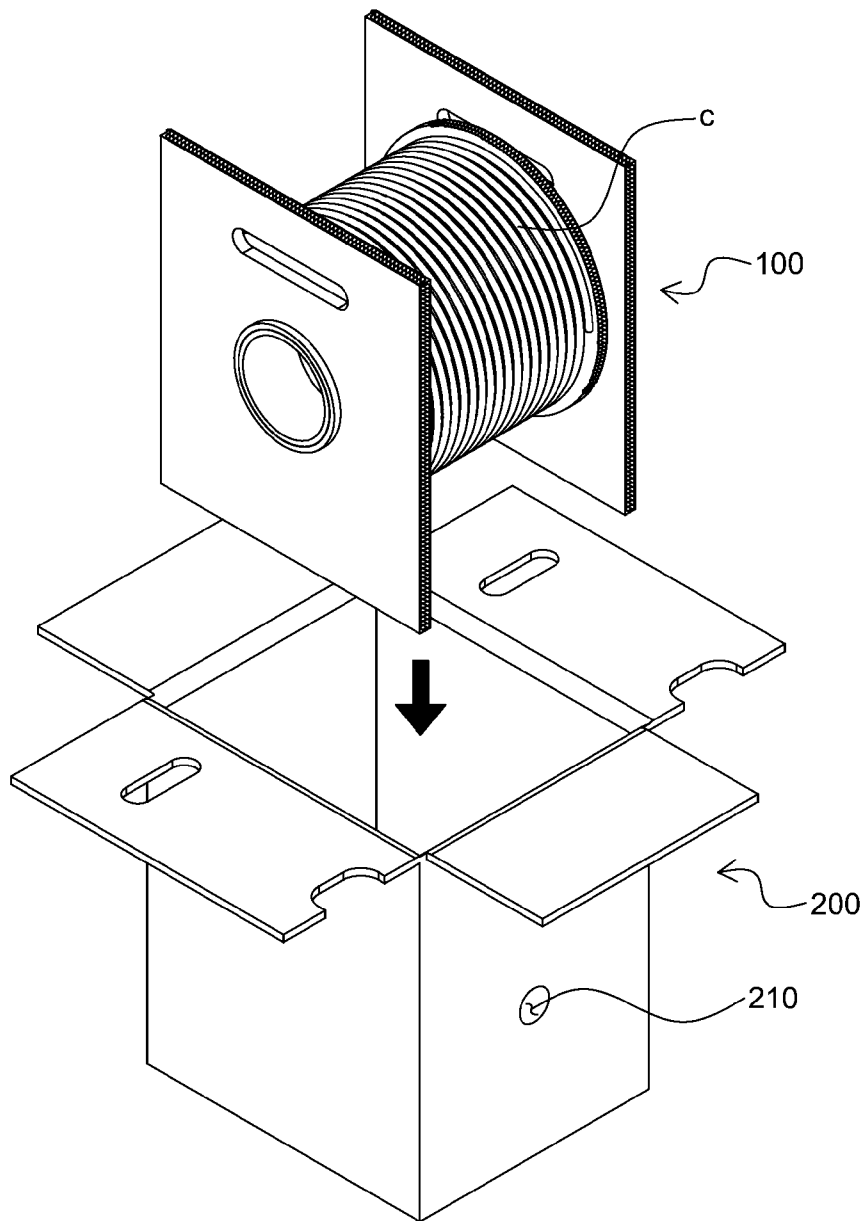
Claims

- [Claim 1] A cable bobbin assembly comprising:
a bobbin member which has a circular pipe shape and on which a cable is wound;
a pair of side flanges fixed on both ends of the bobbin member;
a pair of flange holders configured to fix the pair of side flanges on the bobbin member;
a pair of side support members configured to rotatably support the pair of flange holders; and
a separation-prevention member arranged to pass through the bobbin member having the pair of flange holders thereon in a state in which the pair of side flanges are interposed between the bobbin member and the pair of flange holders, and configured to prevent the pair of flange holders from being separated from the pair of side support members, wherein the bobbin member, the pair of side flanges, the pair of flange holders, the pair of side support members, and the separation-prevention member are each formed of a paper material.
- [Claim 2] The cable bobbin assembly of claim 1, wherein the pair of side flanges each have a disc shape with a through-hole which one of the pair of flange holders passes through, and
each of the pair of flange holders comprises:
an insertion part configured to be inserted into the bobbin member; and
a rotation part forming a step with the insertion part, and configured to be rotatably inserted into one of installation holes formed in the pair of side support members in a state in which the pair of side flanges are interposed between the bobbin member and the pair of flange holders.
- [Claim 3] The cable bobbin assembly of claim 2, wherein the separation-prevention member prevents the rotation parts of the pair of flange holders from being separated from the installation holes of the pair of side support members due to an external shock, in a state in which a cable is wound on the bobbin member, the rotation parts of the pair of flange holders are installed in the installation holes of the pair of side support members, and the cable bobbin assembly is accommodated in a packing box.
- [Claim 4] The cable bobbin assembly of claim 3, wherein the separation-prevention member is formed of a paper strip longer than a length of the bobbin member in which the pair of flange holders are mounted on

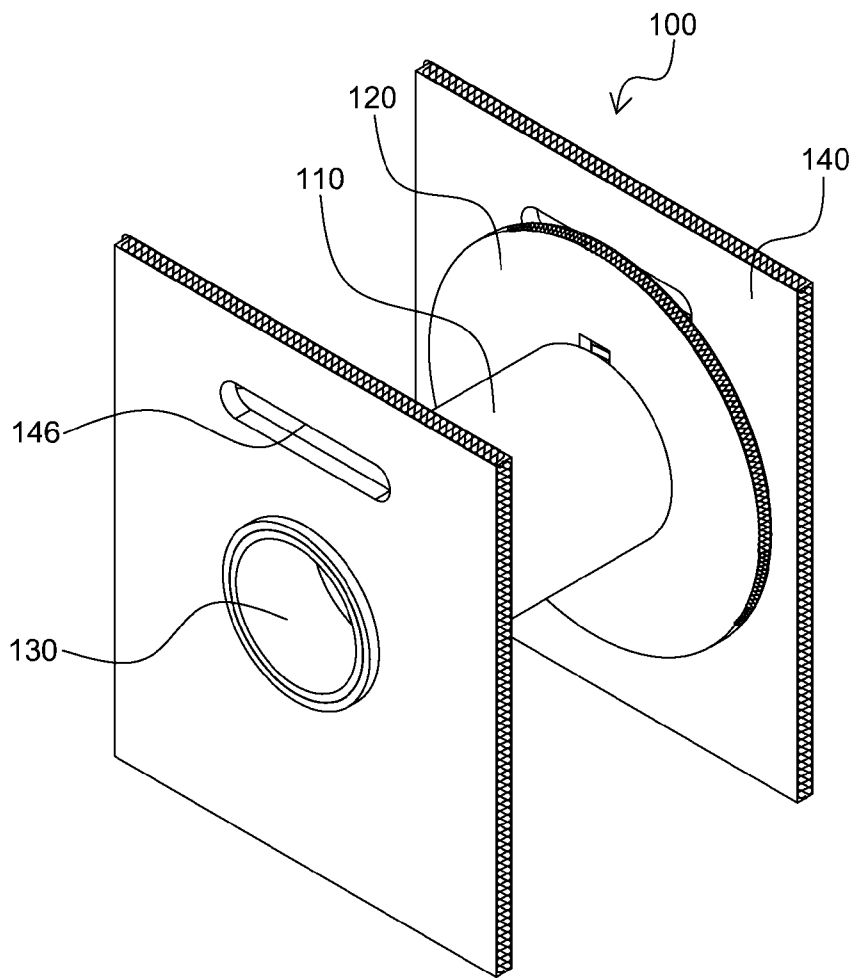
the both ends thereof, wherein parts of the separation-prevention member exposed to the outside of the rotation parts of the pair of flange holders mounted on the both ends of the bobbin member are bent in a direction opposite to a direction in which the cable bobbin assembly is accommodated in the packing box during the accommodating of the cable bobbin assembly in the packing box and are thus located between the packing box and the pair of side support members.

- [Claim 5] The cable bobbin assembly of claim 3, wherein the separation-prevention member has a width which is less than an internal diameter of the bobbin member.
- [Claim 6] The cable bobbin assembly of claim 1, wherein the pair of side support members have a tetragonal shape, and each comprise a grip hole formed as a handle in a long hole shape.
- [Claim 7] The cable bobbin assembly of claim 1, wherein at least one among the pair of side flanges, the pair of side support members, and the separation-prevention member is formed of corrugated cardboard, wherein the corrugated cardboard comprises:
a corrugating medium in which a valley and a peak are arranged repeatedly and alternatively; and
a linear attached onto opposite sides of the corrugating medium.
- [Claim 8] The cable bobbin assembly of claim 7, wherein the corrugated cardboard is a multi-layer corrugated cardboard in which the corrugated medium is formed in multiple layers.
- [Claim 9] The cable bobbin assembly of claim 7, wherein the corrugated cardboard is used in a compressed form.
- [Claim 10] The cable bobbin assembly of claim 7, wherein the pair of side support members are formed by stacking a plurality of sheets of corrugated cardboard.
- [Claim 11] The cable bobbin assembly of claim 1, wherein the pair of side support members have a width corresponding to that of a packing box for packing the cable bobbin assembly.

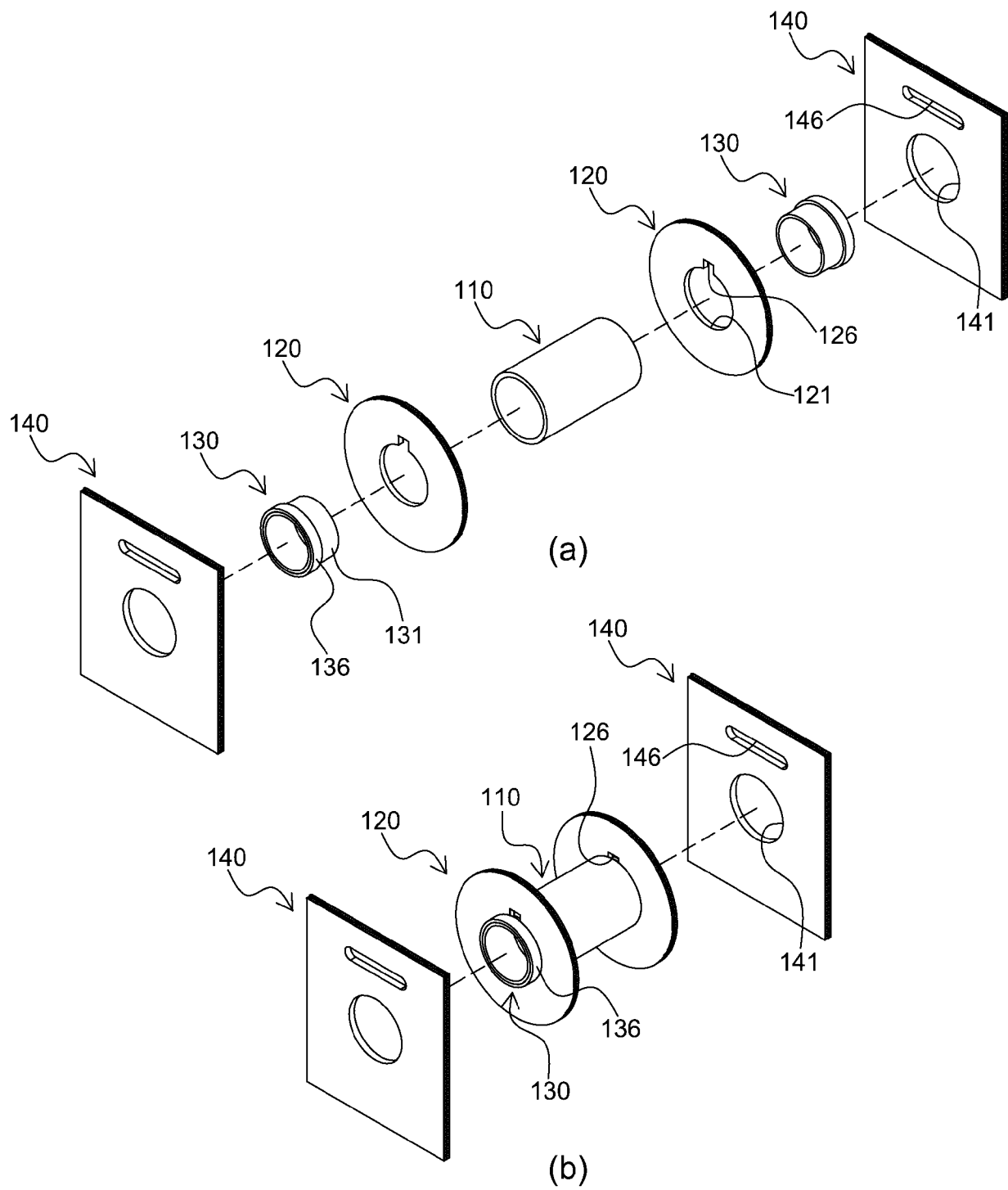
[Fig. 1]



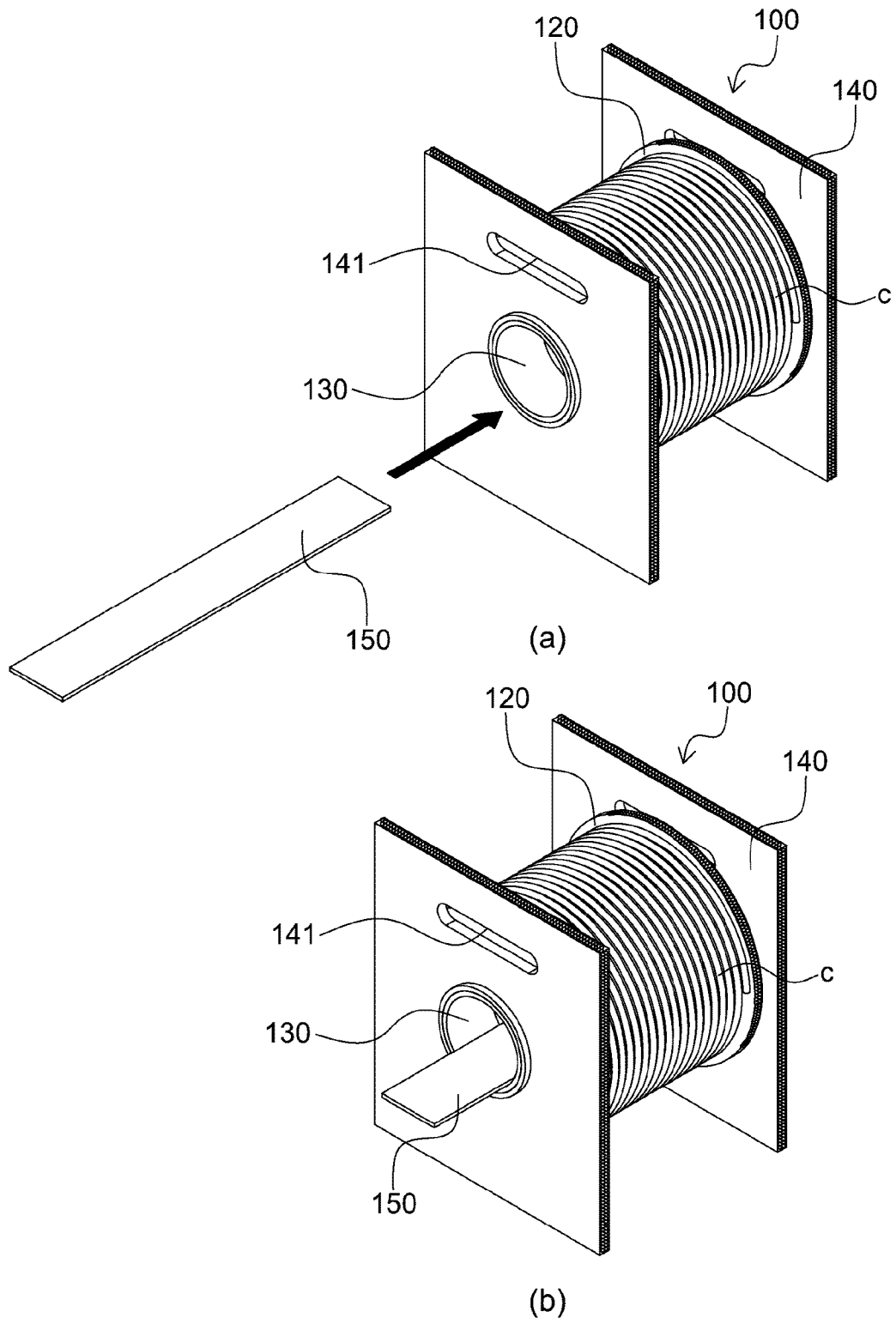
[Fig. 2]



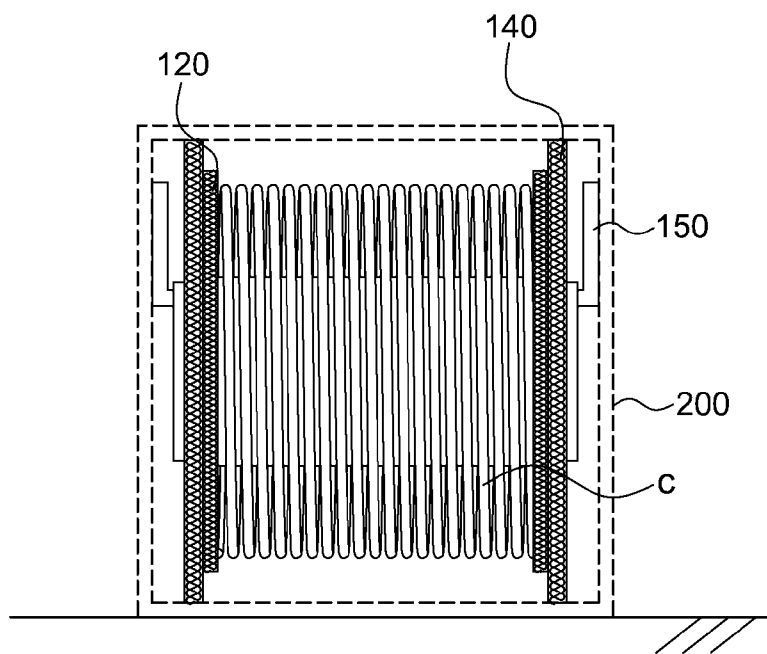
[Fig. 3]



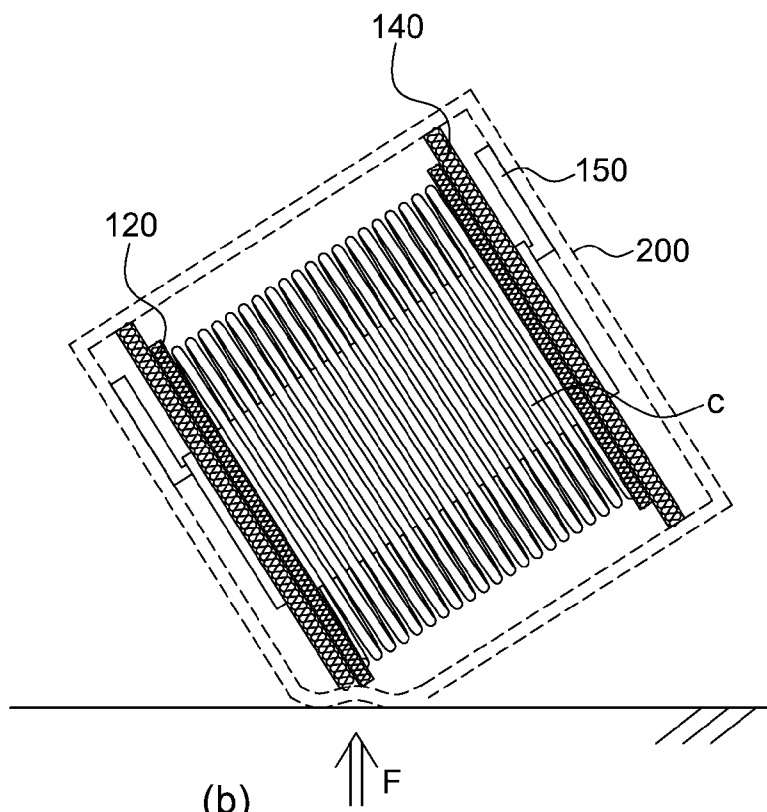
[Fig. 4]



[Fig. 5]

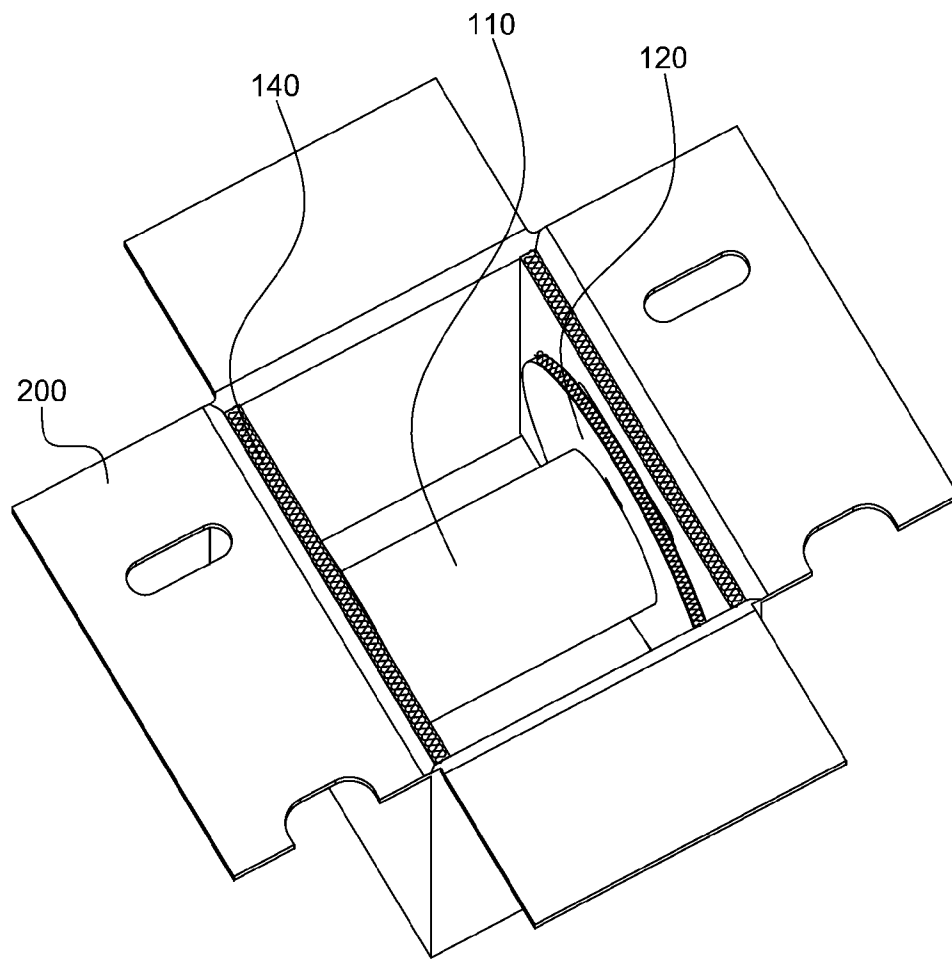


(a)



(b)

[Fig. 6]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2017/005460**A. CLASSIFICATION OF SUBJECT MATTER****B65H 75/18(2006.01)i, B65H 75/14(2006.01)i**

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

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
B65H 75/18; B65D 85/04; B65H 75/22; B65H 75/40; B65H 75/14; B65D 65/02; B31F 1/20Documentation 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
Japanese utility models and applications for utility modelsElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & keywords: cable bobbin, side flange, flange holder, support member, separation-prevention member, paper material, corrugated cardboard**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5529186 A (BASS, BENJAMIN A.) 25 June 1996 See column 5, line 25 - column 8, line 10 and figures 2A-5.	1-11
Y	JP 3073068 U (IZAWA, SADA0) 14 November 2000 See paragraphs [0018], [0030]-[0034] and figures 5-6.	1-11
Y	JP 11-060074 A (UTSUI: K.K.) 02 March 1999 See paragraphs [0007]-[0012], [0018] and figures 1-3.	1-11
Y	US 9004392 B1 (BIGBEE, JR. et al.) 14 April 2015 See column 3, line 24 - column 4, line 30 and figures 1B, 3, 7.	2-5
Y	KR 10-2014-0099175 A (LEE, JEONG HYEOK) 11 August 2014 See paragraphs [0022]-[0028] and figures 1-2.	7-10



Further documents are listed in the continuation of Box C.



See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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US 9004392 B1	14/04/2015	None	
KR 10-2014-0099175 A	11/08/2014	None	