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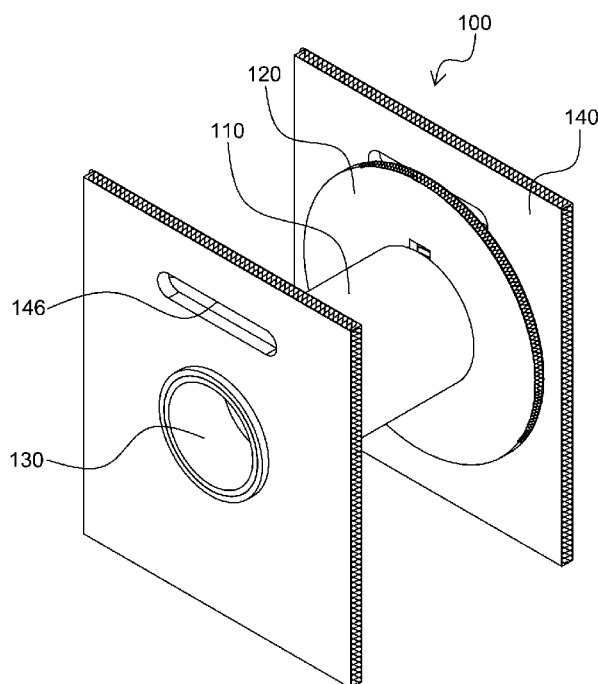
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(54) Title: CABLE BOBBIN ASSEMBLY



(57) Abstract: The present invention relate to a cable bobbin assembly, and more particularly to, a cable bobbin assembly which is formed of a paper material and is thus eco-friendly and can be minimized in weight when it is discarded.



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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 which is formed of a paper material and is thus eco-friendly and can be minimized in weight when it is discarded.

Background Art

- [2] A general cable, the diameter of which is not large, e.g., a communication cable (an optical cable, an unshielded twisted pair (UTP) cable, or the like) 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.
- [5] In detail, 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 cable is consumed and the amount of wastes after the work also increases. The packing box formed of paper and the bobbin member or the support frame installed in this box among the wastes should be separated and classified according to materials and be then put out.
- [6] The volume of the packing box formed of paper may be minimized by folding or crushing it. However, the volume of the bobbin member or the support frame formed of plastic is difficult to be reduced in a workplace. Thus, it is not easy to collect and put out the bobbin member or the support frame and discard it to be recyclable.
- [7] Recently, as described in U.S. Patent No. 9,446,928, a cable bobbin assembly made of paper has been proposed, but it has a problem in that it does not have sufficient rigidity at the time of transportation, work or external impact.

Disclosure of Invention

Technical Problem

- [8] The technical problem is providing a cable bobbin assembly, and more particularly to, a cable bobbin assembly which is formed of a paper material and is thus eco-friendly and can be minimized in weight when it is discarded

Solution to Problem

- [9] The present invention is directed to a cable bobbin assembly, and more particularly to, a cable bobbin assembly which is formed of a paper material and is thus eco-friendly and can be minimized in weight when it is discarded.
- [10] 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 having stepped structures to be inserted into the both ends of the bobbin member to fix the pair of side flanges on the bobbin member and a pair of side support members configured to rotatably support the pair of flange holders, wherein the bobbin member, the pair of side flanges, the pair of flange holders, and the pair of side support members are each formed of a paper material.
- [11] 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.
- [12] 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, configured to support one of the pair of side flanges in a state in which the pair of side flanges are interposed between the bobbin member and the pair of flange holders, and rotatably mounted on one of the pair of side support members.
- [13] And the insertion parts of the pair of flange holders may have an external diameter corresponding to an internal diameter of the bobbin member.
- [14] And the rotation parts of the pair of flange holders may have an external diameter greater than an external diameter of the insertion parts of the pair of flange holder.
- [15] And the insertion parts of the pair of flange holders may be formed by mounting an outer pipe member on an outer circumference surface of an inner pipe member, wherein the outer pipe member may have an internal diameter corresponding to an external diameter of the inner pipe member and is shorter than the inner pipe member.
- [16] And the pair of flange holders, the pair of side flanges, and the bobbin member may be fixed together by applying an adhesive onto side surfaces of the insertion parts and the steps, when the pair of flange holders are mounted on the bobbin member in a state in which the pair of side flanges are interposed between the pair of flange holders and the bobbin member.
- [17] And the through-holes of the pair of side flanges may have a diameter corresponding

to an external diameter of the insertion parts of the pair of flange holders.

[18] And a stopping part may be formed at each of the through-holes of the pair of side flanges to maintain an initial wound state of a cable.

[19] And each of the pair of side support members may comprise a round installation hole in which one of the rotation parts of the pair of flange holders is rotatably mounted.

[20] 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.

[21] And at least one among the pair of side flanges and the pair of side support members may be formed of corrugated cardboard, wherein the corrugated cardboard may comprise 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.

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

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

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

Advantageous Effects of Invention

[25] 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.

[26] 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.

[27] 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

[28] FIG. 1 is a diagram illustrating a cable bobbin assembly on which a cable is wound and a packing box according to an embodiment of the present invention.

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

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

[31] FIG. 4 is a perspective view illustrating a state in which a cable bobbin assembly according to an embodiment of the present invention is accommodated in a packing box.

Best Mode for Carrying out the Invention

- [32] 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.
- [33] FIG. 1 is a diagram illustrating a packing box 200 for a cable bobbin assembly 100 and an inner core of the cable bobbin assembly 100 on which a communication cable(c) is wound, according to an embodiment of the present invention.
- [34] The 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.
- [35] 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.
- [36] However, when a work of building the communication network or the 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.
- [37] 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. When all of the elements of the cable bobbin assembly 100 are formed of paper, problems such as inappropriate hardness of the cable bobbin assembly, rubbing of the bobbin member when it is rotated, etc. are more likely to occur than when these elements are formed of plastic as in the related art.
- [38] A cable bobbin assembly 100 according to an embodiment of the present invention, which is capable of solving the above problems, will be described in detail with reference to FIG. 2, etc.
- [39] 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.
- [40] 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 com-

munication cable is wound, a pair of side flanges 120 fixed on both ends of the bobbin member 110, a pair of flange holders 130 having a stepped structure and inserted into the both ends of the bobbin members 110 to fix the pair of side flanges 120 on the bobbin member 110, and a pair of side support members 140 supporting the pair of flange holders 130 to be rotatable. The bobbin member 110, the pair of side flanges 120, the pair of flange holders 130, and the pair of side support members 140 are each formed of a paper material.

- [41] 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.
- [42] 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.
- [43] 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.
- [44] 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.
- [45] The pair of flange holders 130 may serve the 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.
- [46] 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.
- [47] 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.
- [48] Furthermore, the insertion part 131 and the rotation part 136 of each of the pair of flange holders 130 may 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.

- [49] 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.
- [50] 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.
- [51] As described above, as the pair of flange holders 130, the pair of side flanges 120, and the bobbin member 110 are fixed together, the rotation parts 136 of the pair of flange holders 130 may be rotated together with the pair of side support members 140 while being inserted into and supported by the installation holes 141 of the pair of side support members 140, when an operator pulls out the cable from the packing box 200.
- [52] 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.
- [53] 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.
- [54] 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.
- [55] 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.

- [56] 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.
- [57] 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.
- [58] 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.
- [59] 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.
- [60] FIG. 4 is a perspective view illustrating a state in which the cable bobbin assembly 100 according to an embodiment of the present invention is accommodated in a packing box.
- [61] As also illustrated in FIG. 3, the pair of the side support members 140 have a tetragonal shape and 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.
- [62] Furthermore, 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.
- [63] 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.
- [64] 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.

- [65] Furthermore, as illustrated in FIG. 4, 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.
- [66] 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.
- [67] 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.
- [68] 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.
- [69] 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.
- [70] 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.
- [71] 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.

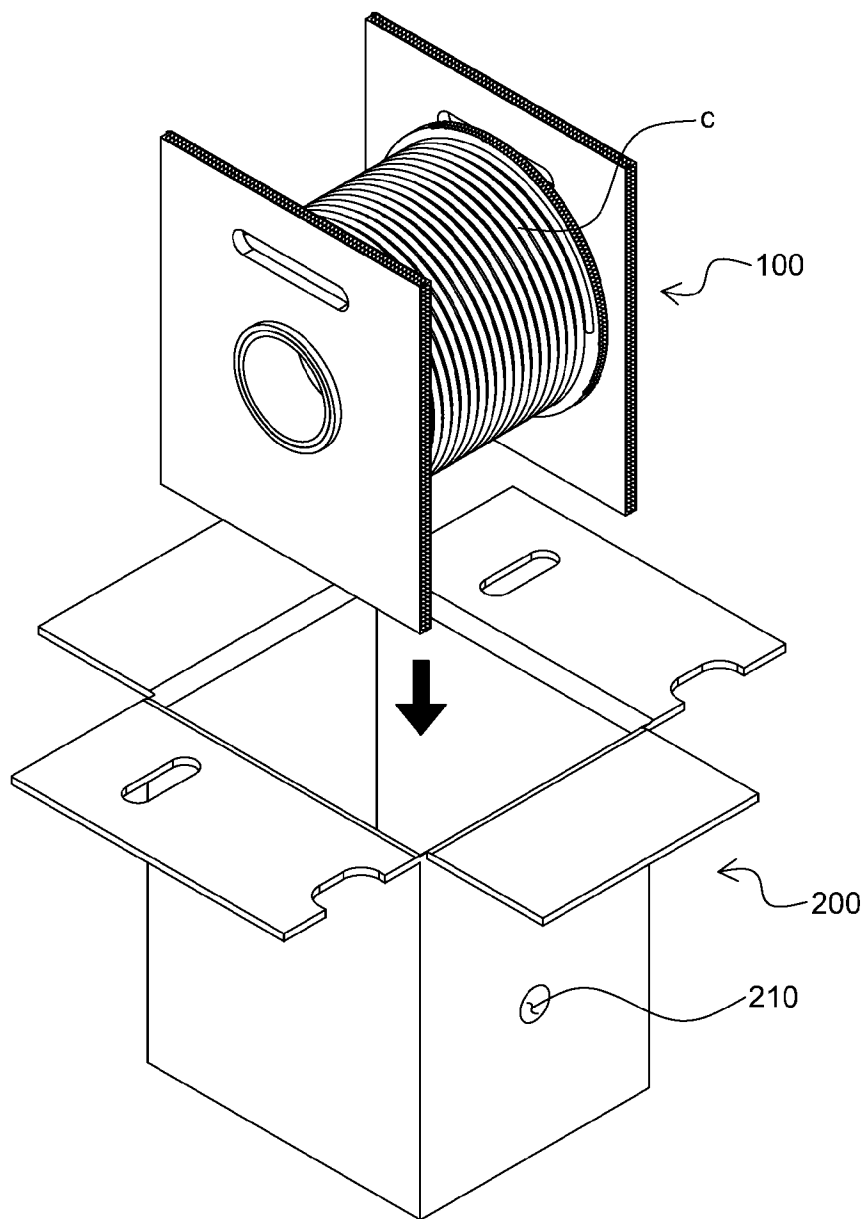
Claims

- [Claim 1] 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 having stepped structures to be inserted into the both ends of the bobbin member to fix the pair of side flanges on the bobbin member; and
a pair of side support members configured to rotatably support the pair of flange holders,
wherein the bobbin member, the pair of side flanges, the pair of flange holders, and the pair of side support members 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.
- [Claim 3] The cable bobbin assembly of claim 1, wherein 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, configured to support one of the pair of side flanges in a state in which the pair of side flanges are interposed between the bobbin member and the pair of flange holders, and rotatably mounted on one of the pair of side support members.
- [Claim 4] The cable bobbin assembly of claim 3, wherein the insertion parts of the pair of flange holders have an external diameter corresponding to an internal diameter of the bobbin member.
- [Claim 5] The cable bobbin assembly of claim 3, wherein the rotation parts of the pair of flange holders have an external diameter greater than an external diameter of the insertion parts of the pair of flange holder.
- [Claim 6] The cable bobbin assembly of claim 3, wherein the insertion parts of the pair of flange holders are formed by mounting an outer pipe member on an outer circumference surface of an inner pipe member, wherein the outer pipe member has an internal diameter corresponding to an external diameter of the inner pipe member and is shorter than the inner pipe member.
- [Claim 7] The cable bobbin assembly of claim 3, wherein the pair of flange

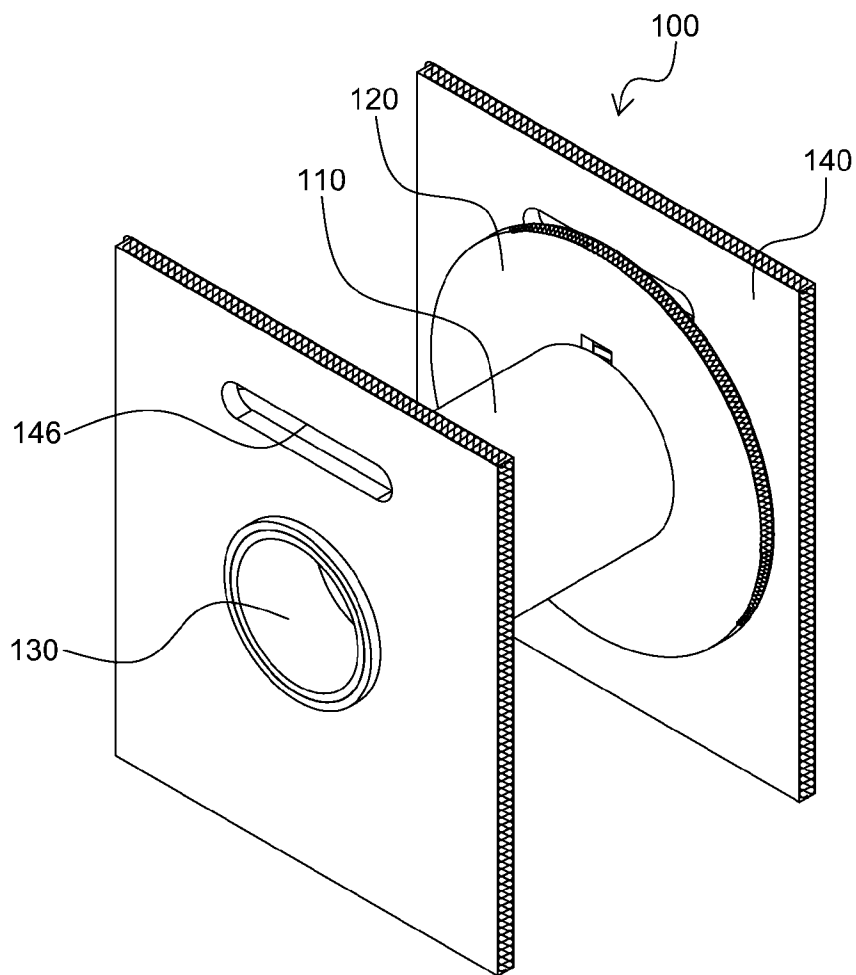
holders, the pair of side flanges, and the bobbin member are fixed together by applying an adhesive onto side surfaces of the insertion parts and the steps, when the pair of flange holders are mounted on the bobbin member in a state in which the pair of side flanges are interposed between the pair of flange holders and the bobbin member.

- [Claim 8] The cable bobbin assembly of claim 7, wherein the through-holes of the pair of side flanges have a diameter corresponding to an external diameter of the insertion parts of the pair of flange holders.
- [Claim 9] The cable bobbin assembly of claim 2, wherein a stopping part is formed at each of the through-holes of the pair of side flanges to maintain an initial wound state of a cable.
- [Claim 10] The cable bobbin assembly of claim 3, wherein each of the pair of side support members comprises a round installation hole in which one of the rotation parts of the pair of flange holders is rotatably mounted.
- [Claim 11] 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 12] The cable bobbin assembly of claim 1, wherein at least one among the pair of side flanges and the pair of side support members 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 13] The cable bobbin assembly of claim 12, wherein the corrugated cardboard is a multi-layer corrugated cardboard in which the corrugated medium is formed in multiple layers.
- [Claim 14] The cable bobbin assembly of claim 12, wherein the corrugated cardboard is used in a compressed form.
- [Claim 15] The cable bobbin assembly of claim 12, wherein the pair of side support members are formed by stacking a plurality of sheets of corrugated cardboard.
- [Claim 16] The cable bobbin assembly of claim 1, wherein the pair of side support members have a width corresponding to that of a packing box.

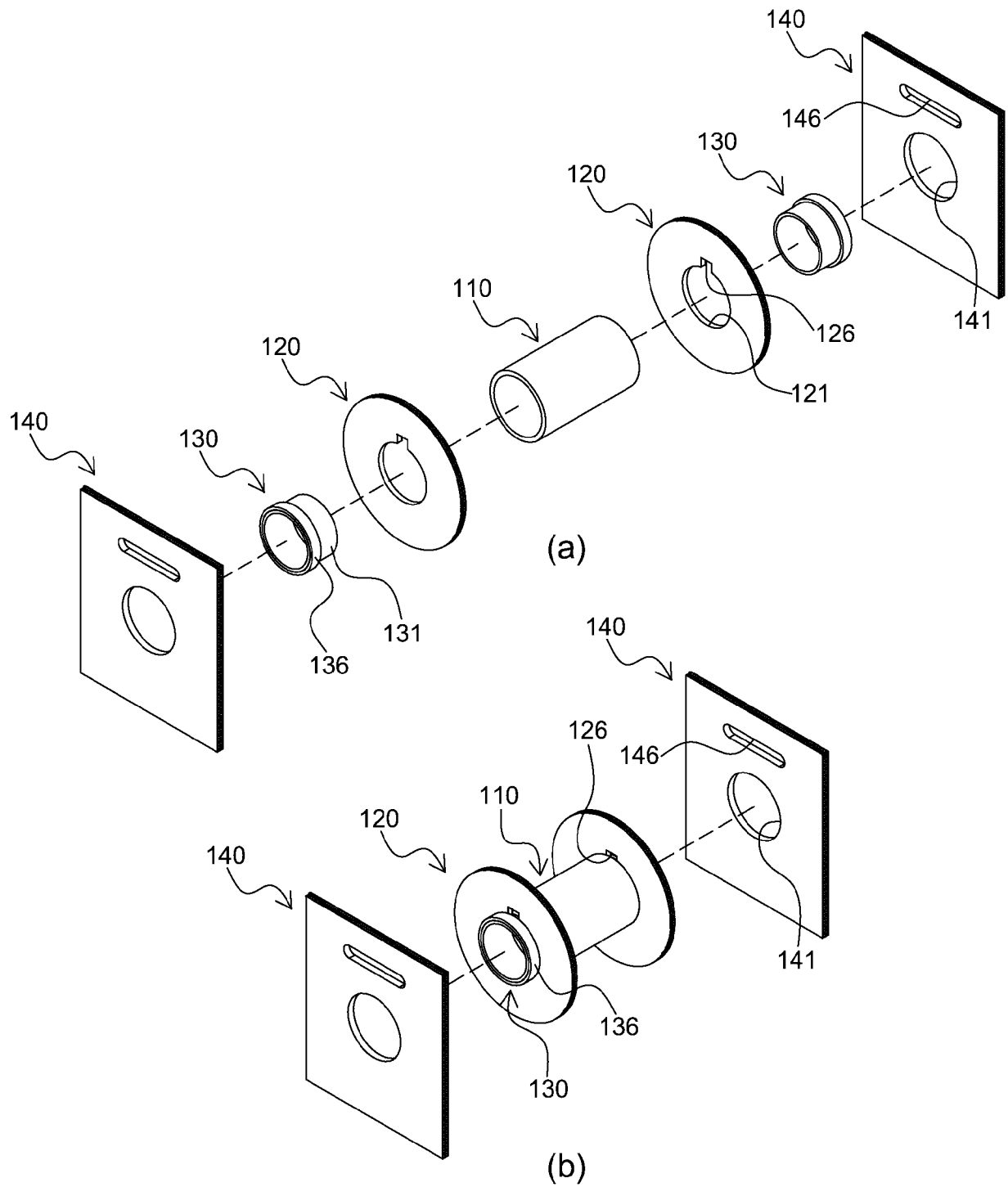
[Fig. 1]



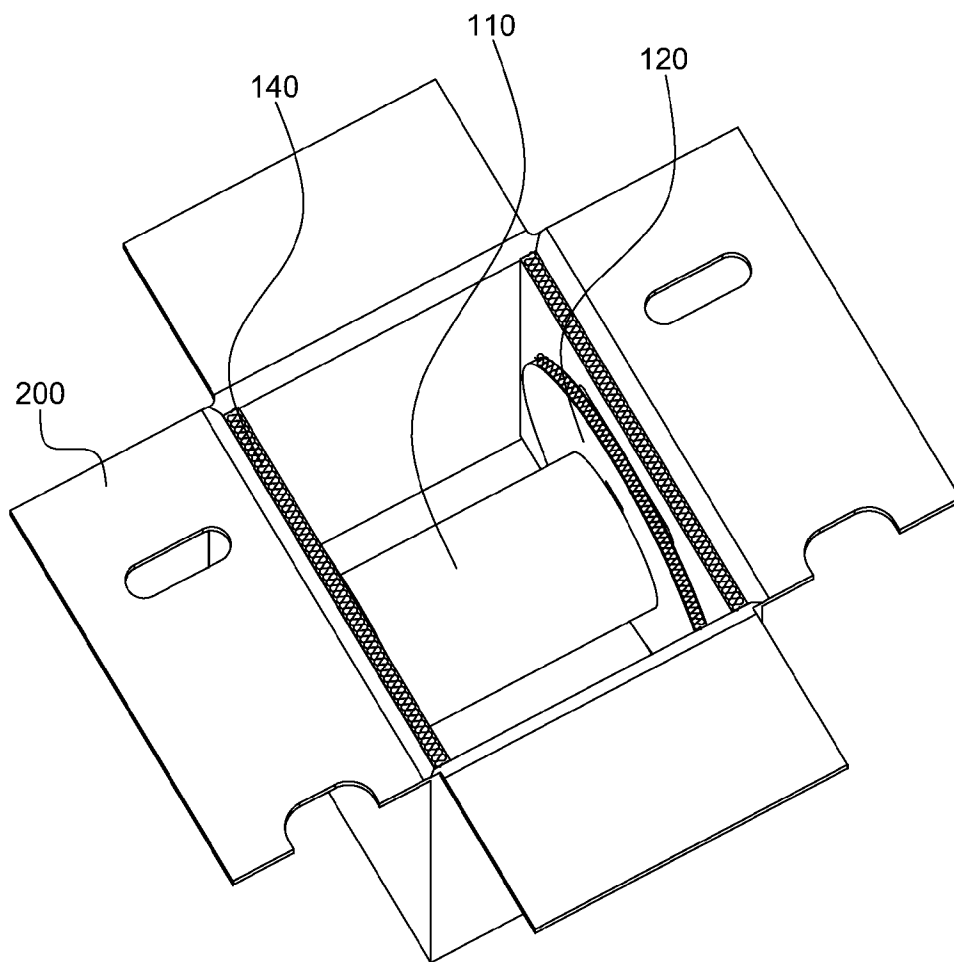
[Fig. 2]



[Fig. 3]



[Fig. 4]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2017/005459**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 SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65H 75/18; B65D 85/04; B65H 75/22; B65H 75/40; B65H 75/02; B65H 75/14; B65D 65/02; B31F 1/20; B65D 5/74

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

Japanese utility models and applications for utility models

Electronic 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, 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.	1-16
Y	JP 11-060074 A (UTSUI: K.K.) 02 March 1999 See paragraphs [0007]-[0012], [0018] and figures 1-3.	1-16
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.	10
Y	KR 10-2014-0099175 A (LEE, JEONG HYEOK) 11 August 2014 See paragraphs [0022]-[0028] and figures 1-2.	12-15
A	JP 2004-217354 A (SHOWA ELECTRIC WIRE & CABLE CO., LTD.) 05 August 2004 See paragraphs [0011]-[0013] and figures 1-4.	1-16



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search

15 September 2017 (15.09.2017)

Date of mailing of the international search report

18 September 2017 (18.09.2017)

Name and mailing address of the ISA/KR

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Information on patent family members

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