MULTIPLE REEL CABLE CARTON

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Publication Classification

<table>
<thead>
<tr>
<th>Int. Cl.</th>
<th>( B65D \ 85/04 )</th>
<th>( B65H \ 49/00 )</th>
<th>( B65H \ 49/26 )</th>
<th>( B65D \ 25/10 )</th>
<th>( B65D \ 25/38 )</th>
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<td>( 2006.01 )</td>
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<td>( 2006.01 )</td>
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U.S. Cl. \( 242/588.3 \); \( 53/430 \); \( 53/467 \); \( 229/199 \); \( 206/391 \); \( 206/409 \)

ABSTRACT

A container for dispensing cable comprises a carton having a plurality of panels, a plurality of reels, a plurality of axles, and first and second support panels. The reels fit onto the axles which rest in axle holes punched into the support panels. Each support panel sits inside the carton and is made up of one or more flaps. Preferably, each panel has at least two flaps that space one of the flaps from the panels of the carton to ensure the axles rest in the axle holes. Preferably, dispensing slots are disposed to be in the front panel in front of the respective reels.
CUSTOM WIND CABLES ONTO REELS

OPEN DISPENSING CARTON

INSTALL FIRST SUPPORT PANEL

INSTALL AXLES INTO FIRST SUPPORT PANEL

INSTALL REELS ONTO AXLES

AFFIX CABLE END TO CARTON

INSTALL SECOND SUPPORT PANEL

AFFIX PULL LINE TO CABLE ENDS

CLOSE CARTON

AFFIX CARTON TO STRUCTURE

INSERT AXIAL SUPPORT MEMBER THROUGH LEFT ARBOR HOLE

PASS AXIAL SUPPORT MEMBER THROUGH CARTON AND RIGHT ARBOR HOLE

ATTACH AXIAL SUPPORT MEMBER TO STRUCTURE

FIG. 6
MULTIPLE REEL CABLE CARTON

BACKGROUND OF THE INVENTION

[0001] Wire and cable for installation in residences and buildings typically comes on cable reels. The types of wire and cable are numerous and include 110V three-conductor wire, “Romex”, and dozens of different kinds of low-voltage, multiconductor insulated communications cable, such as that used for setting up Ethernet networks, intercom systems, entertainment systems and the connection of security sensors and devices. A new building under construction will need many kinds of these cables, and several reels of cable will be used by an installer or systems integrator on-site.

[0002] One known technique is to provide coils of such cable in boxes and to create a hole in a front or top panel of the (typically cardboard) box for pulling out a desired length of cable. This conventional method has a drawback in that the cable may kink inside of the box or otherwise resist being pulled out of the box to such an extent that a cable installer or technician finds that he or she is pulling the box across the floor. Further, the installer has to install several different lengths of cable on a single run. To do this, the installer has had to identify which kinds of cable he or she needs, individually pull cable out of separate boxes, and estimate as best as he or she can the amount of cable so pulled.

[0003] Different cables are typically packed in separate boxes or reels which are often large, heavy, and cumbersome and typically contain long lengths of cable. As a result, the installer has to move multiple large boxes around the job site to install the cables. Moreover, the desired length of each cable for a particular job is usually much shorter than the length of cable in the cartons, so the installer wastes time and energy transporting multiple boxes or reels with too much cable around the job site. The cost for the labor to install this cable typically far exceeds the cost of the cable itself. Anything which can be done to minimize this labor cost conveys a distinct technical advantage. A need, therefore, persists for more efficient methods and apparatus for packing and dispensing cable.

SUMMARY OF THE INVENTION

[0004] A container for the dispensing of wound cable or wire on reels comprises a carton having a plurality of panels including a front panel having bottom, left and right sides. A bottom panel extends from the bottom side of the front panel and has an upper surface. A left panel extends from the left side of the front panel so as to be orthogonal to the bottom panel and a right panel extends from the right side of the front panel so as to be parallel and spaced from the left panel.

[0005] A plurality of reels of cable is rotatably mounted in the carton, so that multiple kinds and/or lengths of cable can be dispensed out of the same carton at the same time. The plurality of reels includes a first reel having a hollow spindle having a right spindle end, a left spindle end, a first spindle length, a left reel flange on the first spindle end, and a right reel flange on the second spindle end. The right and left reel flanges each have a first flange radius.

[0006] A second reel includes a second hollow spindle having a right spindle end, a left spindle end, a second spindle length, a left reel flange on the first spindle end, and a right reel flange on the second spindle end. The right and left reel flanges have a second flange radius.

[0007] First and second axles are supported between a first support panel and a second support panel. Each axle has a first end, a second end, and a length between the first and second ends that is longer than the first and second spindle lengths. The first support panel is disposed near, to the right of, and parallel to the left panel and has a first set of axle holes. Each axle hole is adapted to receive the first end of an axle and the axle holes are spaced apart from each other by at least the first flange radius plus the second flange radius. Each axle hole is spaced from the panels such that the flange does not contact the panels.

[0008] Further, the container has a second support panel disposed near, to the left of, and parallel to the right panel and has a second set of axle holes with each axle hole being adapted to receive the second end of an axle. The second set of axle holes is equal in number and spacing to the first set of axle holes. The first and second reels are rotatably mounted on the first and second axles between the first and second support panels. Preferably, the axles are parallel to one another when inserted into the first and second sets of axle holes.

[0009] Additionally, a method for packing cable to increase the ease of simultaneous installation of multiple cables comprises the steps of custom winding a plurality of cables onto a plurality of reels with each reel having a hollow spindle and opening a dispensing carton. The method further comprises installing a first vertical support panel having a first set of axle holes into the dispensing carton and installing a plurality of axles, each axle having a first end and second end, by inserting the first end of each axle into the first set of axle holes. The method further comprises installing the reels into the carton by slipping the hollow spindle of each reel onto an axle, installing a second support panel having a second set of axle holes in the dispensing carton by slipping the second end of each axle into the respective axle hole in the second support panel, and closing the dispensing carton.

[0010] The different embodiments of the invention may be used with other systems for dispensing wire or cable from reels such as those described in U.S. application Ser. No. 12/103,790, now U.S. Published Patent Application No. 2008/0191436 to Galgano et al., the disclosure of which is expressly incorporated by reference.

[0011] A carton insert for adapting a carton to contain a plurality of cable reel comprises a first support panel disposed near, to the right of, and parallel to a left panel of a carton and having a first support rod hole, a plurality of sides, and a first set of axle holes. Each axle hole in the first set is adapted to receive a first end of an axle and is spaced a first predetermined distance away from the closest side. Each axle hole is also spaced at least twice the first predetermined distance away from the nearest other axle hole and at least a second predetermined distance from the first support rod hole.

[0012] A second support panel is disposed near, to the left of, and parallel to a right panel of the carton and has a second support rod hole, a plurality of sides, and a second set of axle holes. Each axle hole in the second set is adapted to receive a second end of an axle, is at least twice the first predetermined distance from the nearest other axle hole, and is at least the second predetermined distance from the second support rod hole. The second set of axle holes are a mirror image of the first set of axle holes.

[0013] Finally, a container for the dispensing of a cable wound on a cable reel comprises a carton having a plurality of panels including a front panel having bottom, left and right sides. A bottom panel extends from the bottom side of the
front panel and has an upper surface. A left panel extends from the left side of the front panel so as to be orthogonal to the bottom panel and a right panel extends from the right side of the front panel so as to be parallel and spaced from the left panel. A left panel arbor hole is formed in the left panel about an axis and a right panel arbor hole is formed in the right panel around the axis.

Additionally, a plurality of reels is disposed to be adjacent to one another inside the carton and a plurality of reel caddies is disposed in the carton. Each reel caddy supports an end of a reel.

In a preferred embodiment, a first caddy is disposed in the carton adjacent the left panel and to extend upwardly from an upper surface of the bottom panel. A substantially cylindrical bushing of the first caddy extends inwardly toward the right panel and is formed around the axis that is parallel to the bottom panel. The axis is disposed at a first distance measured orthogonally from the upper surface of the bottom panel with the bushing being formed substantially at a first radius from the axis. A hole is formed in the first caddy to be radially inward from an exterior surface of the bushing thereof.

Similarly, a second caddy is disposed in the carton to be left-facing and to extend upwardly from the upper surface of the bottom panel. A substantially cylindrical bushing of the second caddy extends toward the left panel and is formed around the axis. The bushing of the second caddy is formed substantially at the first radius from the axis and a hole being formed in the second caddy to be radially inward from an exterior surface of the bushing thereof.

A third caddy is disposed in the carton to be right-facing and adjacent to the second caddy and extends upwardly from the upper surface of the bottom panel. A substantially cylindrical bushing of the third caddy extends toward the right panel and, like the previous bushings, is formed around the axis. The bushing of the third caddy is formed substantially at the first radius from the axis and a hole is formed in the third caddy to be radially inward from an exterior surface of the bushing thereof.

A fourth caddy is disposed in the carton to be left-facing and to extend upwardly from the upper surface of the bottom panel. A substantially cylindrical bushing of the fourth caddy extends inwardly toward the left panel and is formed around the axis. The bushing of the fourth caddy is formed substantially at the first radius from the axis and a hole is formed in the fourth caddy to be radially inward from an exterior surface of the bushing thereof.

Further, the container further comprises a first reel having spaced-part left and right first reel flanges with the right and left first reel flanges, each having a central hole. The first reel flanges are joined by a first spindle. The central holes of the left and right first reel flanges are each formed around the axis and have a first radius which is greater than said first radius. The bushing of the third caddy may be received in the central hole of the left second reel flange and the bushing of the fourth caddy may be received in the central hole of the right second reel flange. As above, the largest radius of either second reel flange is less than the first distance so as to permit the rotation of the second reel around the axis inside of the carton.

BRIEF DESCRIPTION OF THE DRAWINGS

Further aspects of the invention and their advantages can be discerned in the following detailed description, in which like characters denote like parts and in which:

FIG. 1 is an isometric drawing according to a first embodiment of the invention having four reels;

FIG. 2 is an isometric drawing showing a plurality of reels, spindles, and support panels according to one aspect of the invention;

FIG. 3 is a detail of an alternative embodiment of the invention in which a plurality of reels are mounted on the same axle;

FIG. 4 is a plan view showing first and second support panels according to the invention joined by a spacing flap;

FIG. 5 is an isometric drawing according to a second embodiment of the invention having five reels;

FIG. 6 is a flow diagram showing a method for packing cable;

FIG. 7 is a plan sectional view of the carton according to an embodiment of the invention showing affiliation to a vehicle by an axial support member;

FIG. 8 is an isometric drawing according to another embodiment of the invention having four holes or slots in the front panel to dispense cable;

FIG. 9 is an isometric drawing according to one embodiment of the invention showing three reels positioned adjacent to one another inside a carton;

FIG. 9A is an axial cross sectional view taken substantially along line 9A-9A of FIG. 9.

DETAILED DESCRIPTION

Referring to FIG. 1, a container for the dispensing of cable wound on cable reels, indicated generally at 100, comprises a carton 102 (shown in phantom to reveal inner detail) having a plurality of panels including a front panel 104 having a bottom side 106, a left side 108, and a right side 110. The carton 102 also has a bottom panel 112 that extends from the bottom side 106 of the front panel 104. Further, a left panel 114 extends from the left side 108 of the front panel 104 so as to be orthogonal to the bottom panel 112 and a right panel 116 extends from the right side 110 of the front panel 104 so as to be parallel and spaced from the left panel 114.

Additionally, the container 100 comprises a plurality of reels including a first reel 120 having a first hollow spindle 122 with a left spindle end 124, a right spindle end 126, and a first spindle length 128. The first reel also has a left reel flange 130 on the first spindle end 124 and a right reel flange 132 on the second spindle end 126 with both the right and left reel flanges 130, 132 having a first flange radius 134. Further, the container 100 includes a second reel 136 having a second hollow spindle 138 having a left spindle end 140, a right spindle end 142, and a second spindle length 144. Also, the second reel 136 has a left reel flange 146 on the first spindle end 140 and a right reel flange 148 on the second
spindle end 142 with both the right and left reel flanges 146, 148 having a second flange radius 150. In a preferred embodiment, each flange is made of two layers of cardboard joined to each other and to the spindle as by adhesive.

Referring to FIG. 2, the container 100 further comprises a first axle 202, a second axle 212, and a first support panel 200. The first axle has a first end 204, a second end 206, and a length 208 between the first end 204 and second end 206 that is longer than the first spindle length 128. The second axle 212 has a first end 214, a second end 216, and a length 208 between the first end 214 and second end 216 that is longer than the second spindle length 144. Preferably, the axles 202, 212 are hollow cardboard tubes to reduce weight and use recycled paper material or conduit. If more strength is required, the axles can be solid and made from doweling, plastic, or metal. The first support panel 200 is disposed near, to the right of, and parallel to the left panel (114 of FIG. 1) and has a first set 210 of axle holes 210A-D with each axle hole being adapted to receive the first end 204, 214 of an axle 202, 212 and the axle holes 210A-D being spaced apart from each other by at least the first flange radius 134 plus the second flange radius 150. Each axle hole is spaced from the panels such that the flange does not contact the panels.

Further, the container has a second support panel 220 disposed near, to the left of, and parallel to the right panel (116 of FIG. 1) and has a second set 222 of axle holes 222A-D with each axle hole being adapted to receive the second end 206, 216 of an axle 202, 212. The second set 222 of axle holes is equal in number and spacing to the first set 210 of axle holes. Axle holes 222A-D are positioned in a mirror image to axle holes 210A-D. Preferably, the axles 202, 212 when inserted into the first and second sets 210, 220 of axle holes are parallel to one another. The first and second reels 120, 136, respectively, are rotatably mounted on the first and second axles 202, 212 between the first and second support panels 200, 220.

The left panel 114 (FIG. 1) of the carton includes a left arbor hole 152 and the right panel 116 of the carton includes a right arbor hole 154. An axial support member 172 is passed through the right arbor hole 154, through the carton 102, and through the left arbor hole 152. Further, the first support panel 200 has a first support rod hole 218 and the second support panel 220 has a second support rod hole 224. The first support rod holes 218 and second support rod holes 224 are positioned such that a linear path in the carton 102 does not contact any of the plurality of reels 120, 136. Thus, axle holes 210A-D are positioned so that a linear path between support rod holes 218, 224 are unobstructed. Arbor holes 152, 154 can be in an old box that is adapted to carry four spools with these inserts.

Additionally, one or more handles 156 may be formed into a panel 116 of the carton 102 and at least one panel 104 has at least one hole or elongated slot 158. The slot 158 preferably has a width that is approximately equal to the length 128, 144 of the spindles 122, 138 to permit the dispensing of cable 164A-D from the carton 102. The slot 182, 204, 206, 208 may start out as perforations in the panel 104. The container may be packed with spools of different cable (as more completely described in conjunction with FIG. 6), shipped to a job site, and only then would slots 158, 202-208 be knocked out for the dispensing of cable.

Referring back to FIG. 1, the cables on each reel have a first cable end 162 that is affixed to a surface, preferably an outside surface 160 of the carton 102. Affixing the ends 162 of the cable has the advantage of preventing the reels 120, 136 from rotating and the ends becoming loose inside the carton 102. Additionally, the container may include a pull line 166 affixed to the cable ends 162. The pull line 166 has a lead end 168 and a trailing end 170 that is affixed to each cable end 162. The pull line 166 has a length that is at least a predetermined length of the wound cable. Prior to shipment, the cable end 162 are fed through a much smaller “thumb hole” 174 in each elongated slot 158, 202-208 which has been knocked out prior to shipment to the job site and affixed to the outside surface of the panel 104. The thumb hole 174 allows the installer to knock or tear out the perforated portion of the panel 104 more easily.

In a preferred embodiment, the first set 210 of axle holes comprises four axle holes 210A-D that are equidistant from the left arbor hole (152 of FIG. 1), the second set 222 of axle holes comprises four axle holes 222A-D that are equidistant from the right arbor hole (154 of FIG. 1) and are aligned with the first set of axle holes 210, forming a mirror image of the first set. As can be seen in FIG. 3, two reels 302, 304, or even three reels can share a common axle 306, which is preferably hollow.

Referring to FIG. 4, the first and second support panels 200, 220 are preferably made of cardboard, paper, or fiber board, but other materials such as steel or plastic may be used. As shown in FIG. 4, the first support panel 200 further comprises a first flap 400 having a first set 210 of axle holes 210A-D and a second flap 402 joined to the first flap 400 and in use is folded so as to space the first flap 400 from the left panel 114, (FIG. 7) of the carton such that the first flap 400 supports the ends 204, 214 of the axles 202, 212. Preferably, a third flap 404 is joined to the first flap 400 on a first side 403 opposite the second flap 402, the second and third flaps 402, 404 together forming a first support rod hole 4203. In one embodiment, flaps 402 and 404 may have a third set 410 of axle holes 410A-D positioned such that the third set 410 of axle holes aligns with the first set 210 of axle holes when the second and third flaps 402, 404 are folded to be adjacent to the first flap 400. In other embodiments, flaps 402, 404 do not have axle holes but are “blind.” The second and third flaps 402, 404 space the first flap from the next adjacent panel of the carton 102 when folded back into a single plane. The height and width of the first panel 400 must be less than the height and width of the carton 102.

The distance “d” between axle holes is at least twice the first predetermined distance “r,” which is the maximum size of reel flanges and is shown in broken line. Further, the second predetermined distance “s” between the axle hole and the support rod holes is greater than the first predetermined distance “r” and the distance “s” between the axle hole and the nearest panel of the carton is greater than the predetermined distance “r.”

Similarly, the second support panel 220 further comprises a fourth flap 406 having a second set 222 of axle holes 222A-D and a fifth flap 408 joined to the fourth flap 406.
and folded so as to space the fourth flap 406 from the right panel (not shown) of the carton 102 such that the fourth flap 406 supports the second ends 206, 216 of the axles 202, 216. Further, a sixth flap 412 is joined to the fourth flap 406 on a first side 416 opposite the fifth flap 408, the fifth and sixth flaps 408, 412 together forming a second support rod hole 430 A, B and a fourth set 420 of axle holes 420 A-D positioned such that the fourth set 420 of axle holes aligns with the second set 222 of axle holes when the fifth and sixth flaps 408, 412 are folded to be adjacent to the fourth flap 406. As above, the fifth and sixth flaps 408, 412 space the fourth flap from the next adjacent panel of the carton 102 when folded back into a single plane. Additionally, a spacing flap 422 may be joined to the first flap 400 along a second side 401 of the first flap 400. Preferably, the spacing flap 422 is shorter in length by approximately four cardboard thicknesses than the depth of the carton 102. In addition, the spacing flap may be joined to the fourth flap 406 along a second side 414 of the second support panel 220.

[0044] FIG. 7 is a plan sectional view of the carton showing affinity to an anchor or vehicle, indicated generally at 700, by an axial support member 172. The axial support member 172 is attached to a first anchor point 702 and a second anchor point 704 by a cotter pin 706 or other removable device.

[0045] It is contemplated that the spacing of the first set 210 of axle holes and the second set 222 of axle holes can be arranged in any pattern around the arbor holes 152, 154 such as the reed flanges 130, 146 do not contact one another or the panels of the carton 102, and do not occlude the linear path between support rod holes 218, 224. Thus, as shown in FIG. 5, the container may have four or even five reels. Specifically, the first reel 120 is supported on the first axle 202 which is, in turn, supported by a first axle hole 210 A in the first support panel 200 and a first axle hole 222 A in the second support panel 220. The second reel 136 is supported by the second axle 212 which is, in turn, supported by a second axle hole 210 B in the first support panel 200 and a second axle hole 222 B in the second support panel 220. A third reel 502 has a third flange radius 504 and is supported on a third axle 514 which is, in turn, supported by a third axle hole 210 C in the first support panel 200 and a third axle hole 222 C in the second support panel 220. Further, a fourth reel 504 with a fourth flange radius 508 supported on a fourth axle 516 which is, in turn, supported by a fourth axle hole 210 D in the first support panel 200 and a fourth axle hole 222 D in the second support panel 220. As described above, each axle hole in each support panel is spaced from the nearest adjacent axle hole by at least the flange radius of the associated reel plus the flange radius of the nearest adjacent reel. In addition, each axle hole in each support panel is spaced from its respective support rod hole and from the panels by at least the flange radius of the associated reel.

[0046] Further, the container may comprise a fifth reel 510 having a fifth flange radius 512 and supported on a fifth axle 518 which is, in turn, supported by a fifth axle hole 210 E in the first support panel 200 and a fifth axle hole 222 E in the second support panel 220. The fifth axle hole in each support panel is spaced from the nearest adjacent axle hole by at least the flange radius plus the flange radius of the nearest adjacent reel and is spaced from its respective support rod hole and from the panels by at least the flange radius 512.

[0047] As described above, the reels need not have the same type of cable or even the same flange radii. In fact, the present invention permits the housing of different cable types used in the same job in one carton. For example, a door entry wiring for a home security system comprises four different types of cables: 22 gauge, 6 conductor shielded cable for use with a card reader; 18 gauge, 4 conductor stranded cable to supply power; 22 gauge, 2 conductor wire for use with the door contact; and 22 gauge, 4 conductor wire for use as a spare. Typically, a single carton can carry 125 feet to 500 feet of cable per reel.

[0048] Referring to FIG. 6, a method, indicated generally at (600), for packing cable to increase the ease of simultaneously installing multiple cables comprises the steps of custom winding (602) a plurality of cables onto a plurality of reels with each reel having a hollow spindle and each cable having a free end, opening (604) the dispensing carton, and installing (606) the first support panel. The method further comprises installing (608) at least one axle into the first support panel, installing (610) the reels into a carton, and installing (610) the reels onto the axles. Additionally, the method may include affixing (612) the cable ends to the carton.

[0049] Further, the method comprises installing (614) a second support panel and affixing (616) a pull line to the cable ends, closing (618) the carton, and affixing (620) the carton to a structure. The step of affixing (620) the carton to a structure may comprise the substeps of inserting (622) an axial support member through the left arbor hole, passing (624) the axial support member through the carton and the right arbor hole, and attaching (626) the axial support member to a structure. The support structure may be an anchor but is preferably a vehicle such as a cart dolly, or a hand truck.

[0050] Referring to FIGS. 9 and 9A, a container indicated generally at 900 for the dispensing of cable or wire wound on a reel comprises a carton 902 having a plurality of panels including a front panel 904 having bottom side 906, left side 908, and right side 910. A bottom panel 912 extends from the bottom side 906 of the front panel 904 and has an upper surface 914. A left panel 916 extends from the left side 908 of the front panel 904 so as to be orthogonal to the bottom panel 912 and a right panel 918 extends from the right side 910 of the front panel 904 so as to be parallel and spaced from the left panel 916. A left panel arbor hole 970 is formed in the left panel 916 and a right panel arbor hole 971 is formed in the right panel 918 of the carton 902 around an axis 924.

[0051] A plurality of reels 958, 964, 992 are disposed in the carton 902, the reels being adjacent to one another, and a plurality of reel caddies 920, 930, 940, 950, 976, 984 are disposed in the carton, with each reel caddy supporting an end of a reel.

[0052] Preferably, a first caddy 920 is disposed in the carton 902 adjacent the left panel 916 and to extend upwardly from an upper surface 914 of the bottom panel 912. A substantially cylindrical bushing 922 of the first caddy 920 extends inwardly toward the right panel 918 and is formed around the axis 924 that is parallel to the bottom panel 912. The axis 924 is disposed at a first distance 999 measured orthogonally from the upper surface 914 of the bottom panel 912 with the bushing 922 being formed substantially at a first radius from the axis 924. A hole 926 is formed in the first caddy 920 to be radially inward from an exterior surface 928 of the bushing 922 thereof.

[0053] Similarly, a second caddy 930 is disposed in the carton 902 to be left-facing and to extend upwardly from the upper surface 914 of the bottom panel 912. A substantially cylindrical bushing 932 of the second caddy 930 extends
toward the left panel 916 and is formed around the axis 924. The bushing 932 of the second caddy 930 is formed substantial·ly at the first radius from the axis 924 and a hole 934 is formed in the second caddy 930 to be radially inward from an exterior surface 936 of the bushing 932 thereof.

[0054] A third caddy 940 is disposed in the carton 902 to be right-facing and adjacent to the second caddy 930 and extends upwardly from the upper surface 914 of the bottom panel 912. A substantially cylindrical bushing 942 of the third caddy 940 extends toward the right panel 918 and, like the previous bushings, is formed around the axis 924. The bushing 942 of the third caddy 940 is formed substantially at the first radius from the axis 924 and a hole 943 is formed in the third caddy 940 to be radially inward from an exterior surface 946 of the bushing 942 thereof.

[0055] A fourth caddy 950 is disposed in the carton to be left-facing and to extend upwardly from the upper surface 914 of the bottom panel 912. A substantially cylindrical bushing 952 of the fourth caddy 950 extends inwardly toward the left panel 916 and is formed around the axis 924. The bushing 952 of the fourth caddy is formed substantially at the first radius from the axis 924 and a hole 954 is formed in the fourth caddy 950 to be radially inward from an exterior surface 956 of the bushing 952 thereof.

[0056] Further, the container further comprises a first reel 958 having spaced-part left and right first reel flanges 960, 962 with the right and left first reel flanges each having a central hole. The first reel flanges 960, 962 are joined by a first spindle 964. The central holes of the left and right first reel flanges 960, 962 are each formed around the axis 924 and have a second radius which is greater than the first radius. Thus, the bushing 922 of the first caddy may be received in the central hole of the left first reel flange 960 and the bushing 932 of the second caddy 930 may be received in the central hole of the right first reel flange 962. The largest radius of either the left or right first reel flanges 960, 962 are less than the first distance 999, thereby permitting the first reel 958 to rotate around the axis 924 inside of the carton 902.

[0057] Similarly, a second reel 964 has spaced-part left and right second reel flanges 966, 968, each second reel flange having a central hole and being joined by a second spindle 970. The central holes of the left and right second reel flanges 966, 968 are each formed around the axis 924 and have a third radius which is greater than said first radius. The bushing 942 of the third caddy 940 may be received in the central hole of the left second reel flange 966 and the bushing 952 of the fourth caddy 950 may be received in the central hole of the right second reel flange 968. As above, the largest radius of either second reel flange 966, 968 is less than the first distance 999 so as to permit the rotation of the second reel 964 around the axis 924 inside of the carton 902.

[0058] As described above, the left and right panels 916, 918 of the carton each have an harbor hole 970, 971 formed around the axis 924 and, preferably, the first and second spindles 964, 970 each have an axial passageway 972, 974 for communicating the central holes of the right reel flanges 962, 968 and left reel flanges 960, 966. In one embodiment, the fourth caddy 950 is adjacent to the right panel 918 of the carton 902.

[0059] One embodiment of the invention houses only two reels (such as reels 958 and 964) side-by-side in carton 902, and carton 902 is accordingly not as long as the one shown. In the illustrated embodiment, however, a fifth caddy 976 is disposed in the carton 902 to be right-facing and adjacent to the fourth caddy 950 to extend upwardly from the upper surface 914 of the bottom panel 912, a substantially cylindrical bushing 978 of the fifth caddy 976 extending toward the right panel 918 and formed around the axis 924, the bushing 978 of the fifth caddy 976 being formed substantially at the first radius from the axis 924 and a hole 980 being formed in the fifth caddy 976 to be radially inward from an exterior surface 982 of the bushing 978 thereof.

[0060] Further, in the illustrated embodiment a sixth caddy 984 is disposed in the carton 902 to be left-facing and to extend upwardly from the upper surface of the bottom panel, a substantially cylindrical bushing 986 of the sixth caddy 984 extending inwardly toward the left panel 916 and formed around the axis 924, the bushing 986 of the sixth caddy 984 being formed substantially at the first radius from the axis and a hole 988 being formed in the sixth caddy 984 to be radially inward from an exterior surface 990 of the bushing 986 thereof.

[0061] A third reel 992 housed in carton 902 has spaced-part left and right third reel flanges 994, 996, with each third reel flange having a central hole. The third reel flanges are joined by a third spindle 997, preferably having an axial passageway 995 for communicating the central holes of the right and left third reel flanges 994, 996. The central holes of the left and right third reel flanges are each formed around the axis 924 and have a fourth radius which is greater than said first radius. Thus, the bushing 978 of the fifth caddy 976 may be received in the central hole of the left third reel flange 994 and the bushing 986 of the sixth caddy 984 may be received in the central hole of the right third reel flange 996. The greatest radius of either the right or left third reel flanges 994, 996 is less than the first distance so as to permit the rotation of the first reel 992 around the axis 924 inside of the carton 902. Thus, the sixth caddy 984 may be adjacent to the right panel 918 of the carton 902.

[0062] The back-to-back caddy pairs 930, 940, 950, 976 provide structural support columns inside the interior of carton 902. These columns will receive some of the load of the cable reels stored in carton 902 and insure that there is no cataclysmic sagging of any support rod placed through the carton 902 along axis 924.

[0063] As above, the container preferably includes at least one elongated slot 998 formed in at least one panel of the carton in a direction parallel to the axis to permit the dispensing of cable out of the carton.

[0064] The embodiment illustrated in FIGS. 9 and 9A may be altered by decreasing or increasing one or more of the lengths of the cable reels 958, 964, 992, the length of housing carton 902 thereupon being altered to closely contain them. The number of reels in the embodiment shown in FIGS. 9 and 9A (three) is exemplary only and may be decreased to two or increased.

[0065] In summary, the different embodiments of the invention find their utility by allowing an installer to pull a plurality of cables in a single pull out of one carton that has been custom wound with the desired types and lengths of cables. This reduces the amount of time and effort wasted transporting multiple heavier reels having longer lengths of cable, thereby decreasing labor costs and increasing the speed of the installation.

[0066] While illustrated embodiments of the present invention have been described and illustrated in the appended drawings, the present invention is not limited thereto but only by the scope and spirit of the appended claims.
I claim:

1. A container for the dispensing of cable wound on cable reels, comprising:
   a carton having a plurality of panels including a front panel having bottom, left and right sides, a bottom panel extending from the bottom side of the front panel, a left panel extending from the left side of the front panel so as to be orthogonal to the bottom panel, and a right panel extending from the right side of the front panel so as to be parallel and spaced from the left panel;
   a plurality of reels including:
   a first reel including a first hollow spindle having a right spindle end, a left spindle end, a first spindle length, a left reel flange on the first spindle end, and a right reel flange on the second spindle end, the right and left reel flanges having a first flange radius;
   a second reel including a second hollow spindle having a right spindle end, a left spindle end, a second spindle length, a left reel flange on the first spindle end, and a right reel flange on the second spindle end, the right and left reel flanges having a second flange radius;
   a first axle having a first end, a second end, and a length between the first and second ends that is longer than the first spindle length;
   a second axle having a first end, a second end, and a length between the first and second ends that is longer than the second spindle length;
   a first support panel disposed near, to the right of, and parallel to the left panel of the carton and having a first set of axle holes, each axle hole in the first set being adapted to receive the first end of an axle, the axle holes being spaced apart from each other by at least the first flange radius plus the second flange radius; and
   a second support panel disposed near, to the left of, and parallel to the right panel and having a second set of axle holes, each axle hole being adapted to receive the second end of an axle, the first and second reels respectively and rotatably mounted on the first and second axles between the first and second support panels.

2. The container of claim 1, further comprising a first support rod hole in the first support panel, a second support rod hole in the second support panel, a right arbor hole in the right panel of the carton, and a left arbor hole in the left panel of the carton, the left and right arbor holes being positioned in the left and right panels and the first and second support rod holes positioned in the first and second support panels such that a linear path in the carton between the arbor holes does not intersect any of the plurality of reels.

3. The container of claim 1, wherein the axes are parallel to each other.

4. The container of claim 1, further comprising at least one elongated slot formed in at least one panel of the carton in a direction parallel to at least one axle to permit the dispensing of cable out of the carton.

5. The container of claim 4, further comprising four slots in the front panel.

6. The container of claim 4, wherein the at least one slot comprises one slot per reel.

7. The container of claim 1, wherein the first set of axle holes comprises four axle holes being equidistant from the left arbor hole, the second set of axle holes comprises four axle holes being equidistant from the right arbor hole and each axle hole pair is on an axis, the axes being parallel to each other.

8. The container of claim 1, wherein two reels share a common axle.

9. The container of claim 1, each reel further comprising a predetermined length of wound cable, a first cable end affixed to an outside surface of the carton, and a pull line having a lead end being affixed to each first cable end, the pull line having a length being at least the predetermined length of the wound cable.

10. The container of claim 1, wherein the axes are hollow.

11. The container of claim 1, wherein the axes are solid.

12. The container of claim 1, wherein the plurality of axes is made of a material selected from the group consisting of doweling, paper, cardboard, and conduit.

13. The container of claim 1, wherein the first support panel further comprises a first flap having the first set of axle holes and a second flap joined to the first flap and folded so as to space the first flap from the left panel of the carton such that the first flap supports the first ends of the axles.

14. The container of claim 13, further comprising a third flap joined to the first flap on a first side opposite the second flap.

15. The container of claim 14, wherein the second and third flaps together form a first support rod hole.

16. The container of claim 14, wherein the second and third flaps further comprises a fourth flap having the second set of axle holes and a fifth flap joined to the fourth flap and folded so as to space the fourth flap from the right panel of the carton such that the fourth flap supports the second ends of the axles.

17. The container of claim 15, wherein the second and third flaps folded back into a single plane such that the second and third flaps space the first flap from the next adjacent panel of the carton.

18. The container of claim 13, wherein the second support panel further comprises a fourth flap having the second set of axle holes and a fifth flap joined to the fourth flap and folded so as to space the fourth flap from the right panel of the carton such that the fourth flap supports the second ends of the axles.

19. The container of claim 18, further comprising a sixth flap joined to the fourth flap on a first side opposite the fifth flap.

20. The container of claim 19, wherein the fifth and sixth flaps together form a second support rod hole.

21. The container of claim 19, wherein the fifth and sixth flaps form a fourth set of axle holes positioned such that the fourth set of axle holes aligns with the second set of axle holes when the fifth and sixth flaps are folded to be adjacent to the fourth flap.

22. The container of claim 19, wherein the fifth and sixth flaps folded back into a single plane such that the fifth and sixth flaps space the fourth flap from the next adjacent panel of the carton.

23. The container in claim 18, further comprising a spacing flap being joined to the first flap along a second side of the first flap and being joined to the fourth flap along a second side of the fourth flap.

24. The container of claim 1, further comprising the first supported on the first axle in turn supported by a first axle hole in the first support panel and a first axle hole in the second support panel;

the second reel supported on the second axle in turn supported by a second axle hole in the first support panel and a second axle hole in the second support panel;
a third reel having a third flange radius and supported on a third axle in turn supported by a third axle hole in the first support panel; a fourth reel having a fourth flange radius and supported on a fourth axle in turn supported by a fourth axle hole in the first support panel and a fourth axle hole in the second support panel;
wherein each axle hole in each support panel is spaced from the nearest adjacent axle hole by at least the flange radius of the associated reel plus the flange radius of the nearest adjacent reel; and wherein each hole in each support panel is spaced from its respective support rod hole by at least the flange radius of the associated reel.

25. The container of claim 24, further comprising a fifth reel having a fifth flange radius and supported on a fifth axle in turn supported by a fifth axle hole in the first support panel and a fifth axle hole in the second support panel;
wherein the fifth axle hole in each support panel is spaced from the nearest adjacent hole by at least the fifth flange radius plus the flange radius of the nearest adjacent reel; and wherein the fifth hole in each support panel is spaced from its respective support rod hole by at least the fifth flange radius.

26. A method for packing cable to increase the ease of simultaneously installing multiple cables comprising the steps of: winding a plurality of cables onto a plurality of reels, each reel having a hollow spindle; opening a dispensing carton; installing a first support panel having a first set of axle holes into the dispensing carton; installing a plurality of axles, each axle having a first end and a second end, by inserting the first end of each axle into the first set of axle holes; installing the reels into the carton by slipping the hollow spindle of each reel onto an axle; installing a second support panel having a second set of axle holes into the dispensing carton by slipping the second end of each axle into the respective axle hole in the second support panel; and closing the dispensing carton.

27. The method of claim 26, further comprising affixing a free end of each cable to an outside surface of the carton.

28. The method of claim 27, further comprising affixing a pull line to each free end of the cables.

29. The method of claim 26, further comprising the step of affixing the carton to a structure, the step of affixing further comprising the substeps inserting a first end of an axial support member through the left arbor hole; passing the first end of the axial support member through the carton and the right arbor hole; and attaching the first end and a second end of the axial support member to the structure.

30. The method of claim 25, wherein the structure is a vehicle.

31. The method of claim 26, wherein the vehicle is selected from the group of a cart, a dolly, and a hand truck.

32. A carton insert for adapting a carton to contain a plurality of cable reels comprising a first support panel disposed near, to the right of, and parallel to a left panel of a carton and having a first support rod hole, a plurality of sides, and a first set of axle holes, each axle hole in the first set adapted to receive a first end of an axle and being spaced a first predetermined distance away from the closest side, at least twice the first predetermined distance from the nearest other axle hole, and at least a second predetermined distance from the first support rod hole; and a second support panel disposed near, to the left of, and parallel to a right panel of the carton and having a second support rod hole, a plurality of sides, and a second set of axle holes, each axle hole in the second set adapted to receive a second end of an axle, each axle hole being at least twice the first predetermined distance from the nearest other axle hole, and at least the second predetermined distance from the second support rod hole; wherein the second set of axle holes are a mirror image of the first set of axle holes.

33. The insert of claim 32, wherein the first support panel further comprises a first flap having the first set of axle holes and a second flap joined to the first flap and folded so as to space the first flap from the left panel of the carton such that the first flap supports a first end of at least one axle.

34. The insert of claim 33, further comprising a third flap joined to the first flap on a side opposite the second flap.

35. The insert of claim 34, wherein the second and third flaps together for a first support rod hole.

36. The insert of claim 34, the second and third flaps together form a third set of axle holes positioned such that the third set of axle holes aligns with the first set of axle holes when the second and third flaps are folded to be adjacent to the first flap.

37. The insert of claim 34, wherein the second and third flaps folded back into a single plane such that the second and third flaps space the first flap from the next adjacent panel of the carton.

38. The insert of claim 33, wherein the second support panel further comprises a fourth flap having the second set of axle holes and a fifth flap joined to the fourth flap and folded so as to space the fourth flap from the right panel of the carton such that the fourth flap supports a second end of at least one axle.

39. The insert of claim 37, further comprising a sixth flap joined to the fourth flap on a side opposite the fifth flap.

40. The insert of claim 39, wherein the fifth and sixth flaps together form a second support rod hole.

41. The insert of claim 39, wherein the fifth and sixth flaps together having a fourth set of axle holes positioned such that the fourth set of axle holes aligns with the second set of axle holes when the fifth and sixth flaps are folded to be adjacent to the fourth flap.

42. The insert of claim 38, further comprising a spacing flap joined to the first flap along a second side of the first support panel and along a second side of the fourth flap of the second support panel.

43. The insert of claim 38, further comprising a spacing flap joined to the first flap along a second side of the first support panel.

44. A container for the dispensing of cable or wire wound on a reel, comprising:
a carton having a plurality of panels including a front panel having bottom, left and right sides, a bottom panel extending from the bottom side of the front panel and
having an upper surface, a left panel extending from the
left side of the front panel so as to be orthogonal to the
bottom panel, and a right panel extending from the right
side of the front panel so as to be parallel and spaced
from the left panel;
a left panel arbor hole formed in the left panel around an
axis;
a right panel arbor hole formed in the right panel around the
axis;
a plurality of reels disposed adjacent to one another inside
the carton; and
a plurality of reel caddies disposed in the carton, each reel
caddy supporting an end of a reel.

45. The container of claim 44, further comprising:
a first caddy disposed in the carton to be adjacent the left
panel and to extend upwardly from an upper surface of
the bottom panel, a substantially cylindrical bushing of
the first caddy extending inwardly toward the right
panel, the bushing formed around the axis which is par-
allel to the bottom panel and which is disposed at a first
distance measured orthogonally from the upper surface
of the bottom panel, the bushing being formed substan-
tially at a first radius from the axis and a hole being
formed in the first caddy to be radially inward from an
exterior surface of the bushing thereof;
a second caddy disposed in the carton to be left-facing and
extend upwardly from the upper surface of the bottom
panel, a substantially cylindrical bushing of the second
caddy extending toward the left panel and formed
around the axis, the bushing of the second caddy being
formed substantially at the first radius from the axis and
a hole being formed in the second caddy to be radially
inward from an exterior surface of the bushing thereof;
a third caddy disposed in the carton to be right-facing and
adjacent to the second caddy to extend upwardly from
the upper surface of the bottom panel, a substantially
cylindrical bushing of the third caddy extending toward
the right panel and formed around the axis, the bushing of
the third caddy being formed substantially at the first
radius from the axis and a hole being formed in the third
caddy to be radially inward from an exterior surface of
the bushing thereof;
a fourth caddy disposed in the carton to be left-facing and
extend upwardly from the upper surface of the bottom
panel, a substantially cylindrical bushing of the fourth
caddy extending inwardly toward the left panel and
formed around the axis, the bushing of the fourth caddy
being formed substantially at the first radius from the
axis and a hole being formed in the fourth caddy to be
radially inward from an exterior surface of the bushing
thereof;
a first reel having spaced-part left and right first reel
flanges, the left first reel flange having a central hole, the
right first reel flange having a central hole, the first reel
flanges being joined by a first spindle, the central holes
of the left and right first reel flanges each formed around
the axis and having a second radius which is greater than
said first radius, such that the bushing of the first caddy
may be received in the central hole of the left first reel
flange and the bushing of the second caddy may be
received in the central hole of the right first reel flange, a
greatest radius of the left first reel flange and a greatest
radius of the right first reel flange being less than said
first distance so as to permit the rotation of the first reel
around the axis inside of the carton; and
a second reel having spaced-part left and right second reel
flanges, the left second reel flange having a central hole,
the right second reel flange having a central hole, the
second reel flanges being joined by a second spindle, the
central holes of the left and right second reel flanges each
formed around the axis and having a third radius which
is greater than said first radius, such that the bushing of
the third caddy may be received in the central hole of the
left second reel flange and the bushing of the fourth
caddy may be received in the central hole of the right
second reel flange, a greatest radius of the left second reel
flange and a greatest radius of the right second reel
flange being less than said first distance so as to permit
the rotation of the second reel flange around the axis inside
of the carton.

46. The container of claim 45, wherein the first and second
spindles further comprise an axial passageway for communi-
cating the central holes of the right and left reel flanges.

47. The container of claim 45, further comprising:
a fifth caddy disposed in the carton to be right-facing and
adjacent to the fourth caddy to extend upwardly from
the upper surface of the bottom panel, a substantially cylin-
drical bushing of the fifth caddy extending toward the
right panel and formed around the axis, the bushing of
the fifth caddy being formed substantially at the first
radius from the axis and a hole being formed in the fifth
caddy to be radially inward from an exterior surface of
the bushing thereof;
a sixth caddy disposed in the carton to be left-facing and
to extend upwardly from the upper surface of the bottom
panel, a substantially cylindrical bushing of the sixth
caddy extending inwardly toward the left panel and
formed around the axis, the bushing of the sixth caddy
being formed substantially at the first radius from the
axis and a hole being formed in the sixth caddy to be
radially inward from an exterior surface of the bushing
thereof; and
a third reel having spaced-part left and right third reel
flanges, the left third reel flange having a central hole,
the right third reel flange having a central hole, the third
reel flanges being joined by a third spindle having an
axial passageway for communicating the central holes
of the right and left third reel flanges, the central holes
of the left and right third reel flanges each formed around
the axis and having a fourth radius which is greater than
said first radius, such that the bushing of the fifth caddy
may be received in the central hole of the left third reel
flange and the bushing of the sixth caddy may be
received in the central hole of the right third reel flange,
a greatest radius of the left third reel flange and a greatest
radius of the right third reel flange being less than said
first distance so as to permit the rotation of the first reel
around the axis inside of the carton.

48. The container of claim 47, wherein the sixth caddy is
adjacent to the right panel of the carton.

49. The container of claim 45, wherein the fourth caddy is
adjacent to the right panel of the carton.

50. The container of claim 44, further comprising at least
one elongated slot formed in at least one panel of the carton in
a direction parallel to the axis to permit the dispensing of
cable out of the carton.

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