

July 9, 1963

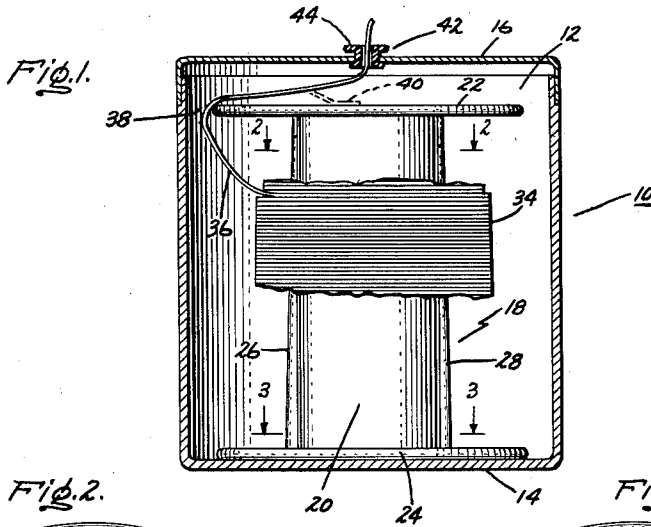
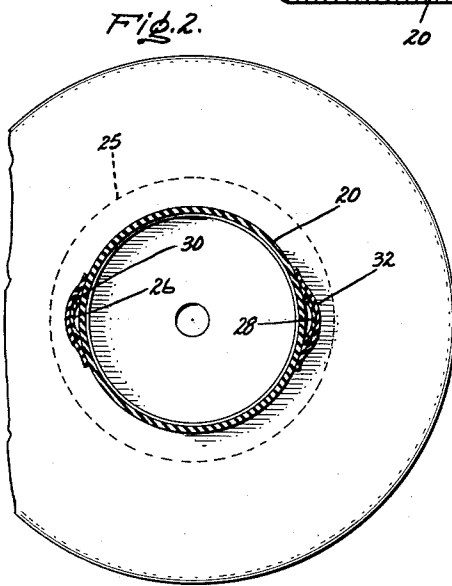
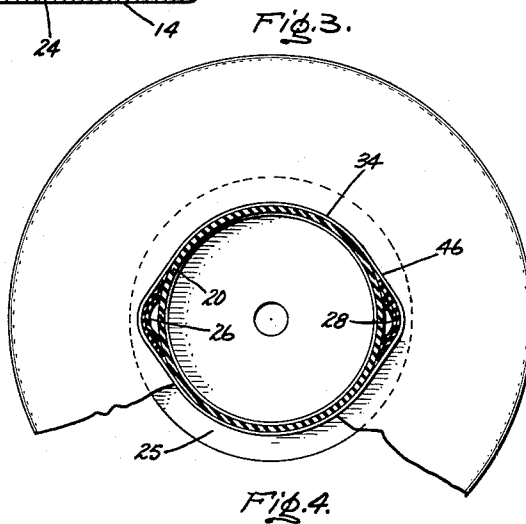
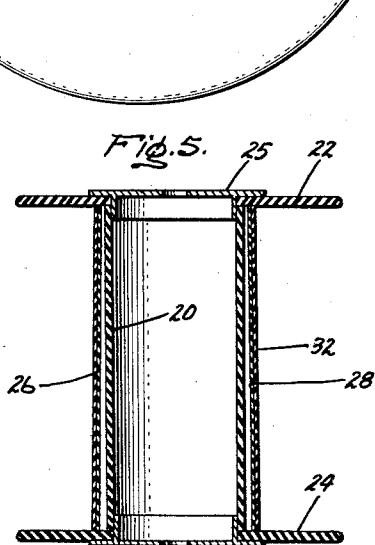
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3,096,951

WIRE PACKAGE AND REEL THEREFOR

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2 Sheets-Sheet 1



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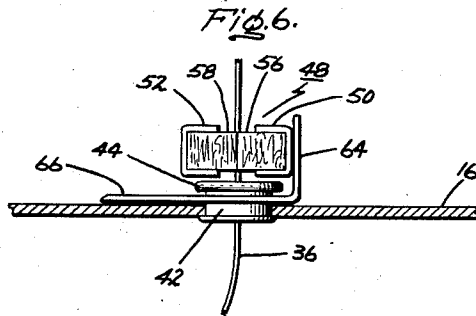
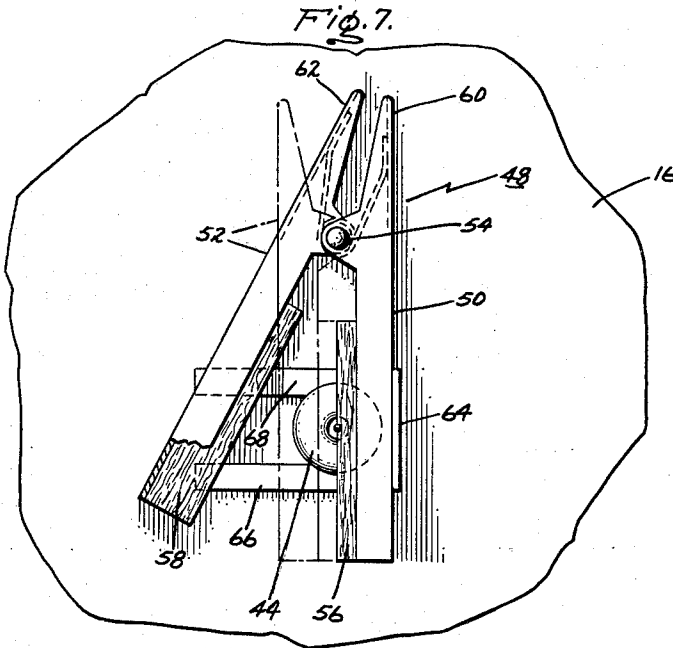
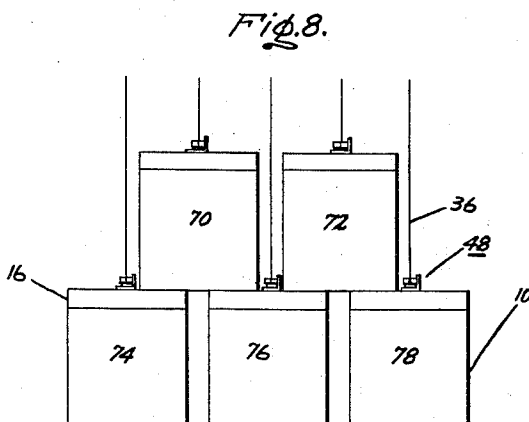
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WIRE PACKAGE AND REEL THEREFOR

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2 Sheets-Sheet 2



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3,096,951

WIRE PACKAGE AND REEL THEREFOR

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15 Claims. (Cl. 242—137.1)

This invention relates generally to packages for shipping and dispensing wire, and more particularly to a package of the type employing a reel or spool positioned in a cylindrical container.

In the past, wire, particularly magnet wire of the type employed for forming the windings of electrical apparatus, such as motors, transformers, and the like, has been initially wound on, shipped on, and dispensed from conventional reels or spools. The use of conventional reels not only involved difficulty in shipment but more particularly necessitated the use of complicated and costly dereeling and braking apparatus for dispensing the wire from the reel.

In an effort to overcome the difficulty involved in the shipment and dispensing of wire from conventional reels, a wire shipping and dispensing package has been provided wherein loose coils or turns of wire are disposed in a cylindrical container about a central hub or core secured to the bottom of the container. In such a system, however, special apparatus is required for dereeling the wire from the container and further, the package is not ready for immediate use upon receipt. Before wire can be dispensed from such a package, it is necessary to remove the cover of the container, remove the wedges employed for holding the wire tight in the container against shifting in transit, thread the free end of the wire through special dereeling apparatus required for the system, and finally to assemble the dereeling apparatus on the container. Furthermore, the dereeling apparatus employed with this system not only is bulky and relatively expensive, but appreciable space is required for storage, storage space generally being at a premium in most coil winding shops.

Efforts have been made to ship conventional reels of wire in cylindrical containers and to dispense the wire directly therefrom without removing the reel from the container. In such an arrangement, however, employing conventional reels having a cylindrical hub or barrel, if the free end of the wire becomes detached during storage or shipment of a package, or most particularly if tension is removed from the wire during the dereeling operation, as by the occurrence of a break in the wire, the wire tends to uncoil and in turn to drop toward the bottom flange of the reel thus causing tangling and breaking of the wire. In an effort to overcome this difficulty, Patent 3,000,493 to Donald A. Hirst discloses an arrangement employing a reel positioned in a cylindrical container, the reel having a conical barrel. While such an arrangement reduces the tendency for the wire, when tension is removed, to drop downwardly on the barrel, it has by no means eliminated the problem. Furthermore, packages of this type known to the present applicant still are not ready for immediate use upon receipt by the user. Here, it has again been necessary to remove the cover of the container and to assemble an elongated metal sleeve upon which wire tensioning devices are mounted over the open end of the container. The dereeling apparatus required to be used with packages of this type again are bulky and relatively costly and require appreciable storage space. In addition to the foregoing, due to the height and configuration of the dereeling devices of prior wire packages employing a cylindrical container, it has not been possible to stack the packages during dispensing of the wire so as to permit the paying-out of the maximum number of individual

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wires to a winding machine with the packages requiring a minimum amount of floor space.

It is therefore desirable to provide a wire shipping and dispensing package of the type employing a reel disposed in a cylindrical container wherein the tendency for untensioned wire to drop downwardly on the barrel is substantially reduced. It is further desirable that such a package be ready for immediate use upon receipt without the requirement for the attachment of special dereeling apparatus. It is desirable however that conventional commercially available tensioning devices be capable of ready attachment to the package, and it is also desirable that a plurality of such packages be capable of being stacked during dispensing of the wire to winding apparatus. It is of course desirable that such package be characterized by its simplicity and relatively low cost.

It is accordingly an object of my invention to provide an improved package for shipping and dispensing wire of the type employing a reel positioned in a cylindrical container.

It is another object of my invention to provide an improved wire shipping and dispensing package employing a reel positioned in a cylindrical container where the package is ready for immediate use without requiring the attachment of auxiliary dereeling devices.

A further object of my invention is to provide an improved wire shipping and dispensing package employing a reel positioned in a cylindrical container wherein the tendency for untensioned wire on the spool to uncoil and drop downwardly is substantially reduced.

Yet another object of my invention is the provision of an improved wire shipping and dispensing package capable of being stacked with other similar packages during the wire dispensing operation.

A still further object of my invention is the provision of an improved wire reel wherein the tendency for untensioned wire to uncoil and drop downwardly on the barrel when the barrel is positioned vertically is substantially reduced.

Further objects and advantages of my invention will become apparent by reference to the following description and the accompanying drawing, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

My invention in its broader aspects provides a wire shipping and dispensing package comprising a cylindrical enclosure with an open upper end and a bottom wall defining the other end. A cover member is provided removably secured to the enclosure and closing the open end thereof. A wire reel is provided having a cylindrical barrel portion with radially extending flanges at the opposite ends thereof, the reel being removably positioned in the enclosure with one of the flanges seated on the bottom wall and with the axis of the barrel generally coextensive with the axis of the enclosure. The axial length of the reel is less than the axial spacing between the cover member and the bottom wall of the enclosure so that the upper flange of the reel is axially spaced from the cover member. The barrel portion of the reel has at least one protuberance formed on its outer surface extending axially between the flanges, the protuberance being radially thicker at its end adjacent the bottom flange than at its end adjacent the upper flange and tapering therebetween. The cover member has an opening formed therein through which the wire is dispensed from the reel.

In the drawing, FIG. 1 is a view, partly in section and and partly broken away, illustrating my improved wire shipping and dispensing package and reel;

FIG. 2 is a cross-sectional view taken along the line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view taken along the line 3—3 of FIG. 1 and showing one coil of wire under tension on the barrel;

FIG. 4 is a cross-sectional view taken along the same plane as FIG. 3, but showing one coil of wire when tension is removed therefrom;

FIG. 5 is a vertical cross-sectional view of the improved wire reel of my invention;

FIG. 6 is a fragmentary cross-sectional view showing the attachment of a wire tensioning device to the package of the previous figures;

FIG. 7 is a top view showing the device of FIG. 6 and its attachment to the package; and

FIG. 8 is a view showing the stacking of a plurality of package in accordance with my invention.

Referring now to FIGS. 1 through 5 of the drawing, my improved wire package comprises a cylindrical container 10 which may be formed of any suitable relatively thin-walled material, such as cardboard, container 10 having an open upper end 12 and a bottom wall 14. A cover member 16, likewise formed of suitable relatively thin material such as cardboard, is removably secured to the container 10 so as to close the open upper end 12, as shown.

A wire reel 18 is provided having a cylindrical barrel portion 20 with conventional flanges 22 and 24 secured to opposite ends thereof. As best seen in FIG. 5, the barrel portion 20 may be formed of suitable relatively thin sheet metal with the flanges 22 and 24 being attached thereto by means of hub portions 26; the construction of the reel thus far described comprising the cylindrical barrel portion 20 and the flanges 22 and 24 is conventional and is shown for illustrative purposes only, it being understood that other reel construction can be equally advantageously employed.

The reel 18 is positioned within the container 10 with flange 24 resting upon the bottom wall 14 and with the barrel portion 20 extending vertically upwardly therefrom with its axis generally coextensive with the axis of the container 10. As best seen in FIG. 1, the axial length of the reel 18 between the flanges 22 and 24 is less than the axial spacing between the bottom wall 14 and the cover 16 so that the upper flange 22 of reel 18 is axially spaced from the cover member 16.

In accordance with my invention, a pair of wedge members 26 and 28 extend axially between the flanges 22 and 24 and are secured to the outer surface of the barrel portion 20 at diametrically opposite points respectively. In the illustrated embodiment, the wedge members 26 and 28 are formed of relatively thin sheet metal and are outwardly curved to provide parallel side edges which are respectively secured to the outer surface of the barrel portion 20, as by welding at 30. It will be seen that the transverse width of the wedge members 26, 28 is substantially less than the radius dimension of the cylindrical barrel portion 20. It will be further seen that the wedge members 26, 28 are substantially radially thicker at their ends adjacent the bottom flange 24 than at their ends adjacent the upper flange 22 and that they taper uniformly therebetween, as best seen in FIGS. 1 and 5. It will thus be seen that the wedge members 26, 28 respectively define downwardly tapering protuberances formed on the outer surface of the barrel portion 20.

In order to protect the insulation on the wire wound on the barrel portion 20 and over the wedge members 26, 28 from the welds 30, suitable sheets 32 of relatively thin material, such as kraft paper respectively cover the wedge members 26, 28 and extend outwardly onto the outer surface of barrel portion 20 thus covering the welds 30; the protective sheets 32 are secured to the barrel portion 20 and the wedge members 26, 28 by any suitable adhesive.

As seen in FIGS. 1 and 3, wire 34 is wound onto the barrel portion 20 between the flanges 22, 24 with its free end being brought upwardly through the radial space 38

defined between the upper flange 22 and the inner wall of the container 10, the free end 36 being initially secured to the upper surface of the upper flange 22 for shipment and storage, as shown by the dashed lines 40. Preferably, the diameter of the upper flange 22 is slightly less than the diameter of the bottom flange 24 in order to provide a suitable radial space 38.

In order to dispense the wire from the reel 18, an eyelet 42 formed of suitable material, such as a ceramic material, is centrally located in the cover member 18 and the free end 36 of the wire then may be fed therethrough, as shown in FIG. 1. It will be seen that the eyelet 42 has a radial flange 44 formed thereon exteriorly of the cover member 16 for a purpose to be hereinafter described.

Referring now to FIGS. 3 and 4, it will be seen that when the wire 34 is initially wound around the barrel portion 20 of the spool 18 under tension, bends 46 are formed at the points where the wire passes over the wedge members 26, 28; due to the tension placed on the wire during the initial winding operation and maintained thereon during shipment and storage, the bends 46 have some degree of permanent set. Referring particularly to FIG. 4, if tension on the wire is relieved so that the free end 36 is loose, it will be observed that the individual turns of the wire 34 are not round due to the bends 46. For this reason the tendency for the wire to uncoil and thus drop is resisted by the tendency for the bends 46 to remain in engagement with their respective wedge members 26, 28. Thus, when tension is removed, the first few bends 46 will move off of their respective wedge members 26, 28 thus causing the first few turns of the wire to loosen, however, the distance by which the bends 46 come out of engagement with and move away from their respective wedge members 26, 28 becomes progressively less and it has been found that within the first few turns of wire, one of the bends 46 will not become disengaged from its respective wedge member 26, 28, thus preventing uncoiling of the turns below that point. Thus, it has been found that when tension is released from the wire 34 on the barrel portion 20, while the first few turns of wire tend to uncoil or loosen and drop downwardly, far fewer turns thus uncoil and drop than was the case with prior packages employing a purely conical barrel.

In addition to the foregoing, it will be readily apparent that in the case of prior packages employing reels having a conical barrel, special tooling was required in order to provide a conical barrel for each different length of traverse, i.e., the axial length of the barrel. In my construction, however, the barrel portion 20 is cylindrical and thus of uniform diameter and therefore can be cut to any length desired from commercially available metal tubing, the wedge members 26, 28 in the appropriate length merely being welded to the outer surface of the cylindrical barrel 20. It will be readily seen, however, that if desired and the quantity of reels justifies the tooling, the wedges 26, 28 may be integrally formed in the wall of the barrel portion 20. Further, it will be seen that the wedges 26, 28 may be of solid cross-section and formed of suitable molded plastic material, and can be adhered to the outer surface of the barrel 20 with suitable adhesive.

In most coil winding apparatus, it is necessary to apply tension to wire as it is dispensed from the reel or package. Referring now to FIGS. 6 and 7, there is shown at 48 a conventional commercially available wire tensioning device comprising a pair of arms 50 and 52 pivotally connected together at 54, the arms 50 and 52 retaining suitable friction material, such as blocks 56 and 58 of felt, as shown. Arms 50 and 52 are biased together by means of a suitable spring (not shown) so that the felt blocks 56, 58 are normally in engagement, as shown in FIG. 6. In order to apply tension to the wire, the arms 50, 52 are manually separated by squeezing their ends 60, 62 together, as shown in FIG. 7, the arms 50, 52 are positioned so

that the blocks 56, 58 embrace the wire, and the force applied to the ends 60, 62 of the arms is released so that under the influence of the spring, the arms 50, 52 come together causing the blocks 56, 58 to engage the wire to apply a frictional braking force thereon. It will be understood that the tensioning device 48 per se does not form a part of my invention, and that other tensioning devices well-known to those skilled in the art may be employed with my invention.

In accordance with my invention, a suitable bracket 64 is secured to one of the arms 50, 52 of the tensioning device 48, bracket 64 having spaced projections or fingers 66, 68 extending under the arms 50, 52. The tension device 48 is removably attached to the eyelet 42 in the cover member 16 by means of the fingers 66, 68 which engage the flange 44 of the eyelet, as shown.

It will now be seen that the improved wire package of my invention is ready for immediate use, it merely being necessary to remove the cover 16, detach the free end 36 of the wire from its point of attachment to the top flange 22, and feed it through the eyelet 44. The cover 16 is then reassembled on the container 10 and the wire may then be dispensed by pulling it upwardly through the eyelet 42, no other dereeling apparatus being required. If the wire being dereeled must be placed under tension at the package, it will be seen that the tensioning device 48 may be readily attached to the eyelet 42 in order to provide the requisite tension.

Referring briefly to FIG. 8, it will be seen that by virtue of the fact that no bulky or odd-configuration dereeling device is required to be attached to the upper end of my package, a plurality of packages 70, 72, 74, 76 and 78 may be stacked one upon the other, as shown, in order to dispense a plurality of individual wires to winding apparatus with a minimum amount of floor space being required.

It will now be readily seen that I have provided an improved wire package and reel wherein the previous tendency for untensioned wire to uncoil and drop downwardly on the barrel of the reel is substantially reduced, and wherein the previously required large and bulky dereeling devices are eliminated, thus in turn eliminating the investment in such devices and the space required for storing the same when not in use.

While I have illustrated and described a specific embodiment of my invention, further modifications and improvements will occur to those skilled in the art, and I desire therefore in the appended claims to cover all modifications which do not depart from the spirit and scope of my invention.

What is claimed is:

1. A wire shipping and dispensing package comprising: a cylindrical enclosure having an open upper end and a bottom wall defining the other end thereof; a cover member removably secured to said enclosure and closing said open end thereof; and a wire reel comprising a cylindrical barrel portion with radially extending flanges at the opposite ends thereof, said reel being removably positioned in said enclosure with one of said flanges seated on said bottom wall and with the axis of said barrel portion generally coextensive with the axis of said enclosure, the axial length of said reel being less than the axial spacing between said cover member and said bottom wall whereby the other of said flanges is axially spaced from said cover member, said barrel portion having at least one elongated axially extending protuberance formed on its outer surface, said protuberance being radially thicker at its end adjacent said one flange than at its end adjacent said other flange and tapering therebetween; said cover member having an opening therein for dispensing wire from said reel.

2. A wire shipping and dispensing package comprising: a cylindrical enclosure having an open upper end and a bottom wall defining the other end thereof; a cover member removably secured to said enclosure and closing said

open end thereof; and a wire reel comprising a cylindrical barrel portion with radially extending flanges at the opposite ends thereof, said reel being removably positioned in said enclosure with one of said flanges seated on said bottom wall and with the axis of said barrel portion generally coextensive with the axis of said enclosure, the axial length of said reel being less than the axial spacing between said cover member and said bottom wall whereby the other of said flanges is axially spaced from said cover member, and at least one wedge member extending axially between said flanges and secured to the outer surface of said barrel portion, said wedge member being radially thicker at its end adjacent said one flange than at its end adjacent said other flange and having its outer surface tapering uniformly therebetween; said cover member having an opening therein for dispensing wire from said reel.

3. The combination of claim 2 wherein said outer surface of said wedge member is outwardly curved in cross-section.

4. The combination of claim 2 wherein said barrel portion is formed of relatively thin sheet metal, said wedge member being formed of relatively thin sheet metal and having parallel side edges, said side edges being respectively integrally joined to said barrel portion, said outer surface of said wedge member being outwardly curved in cross-section.

5. The combination of claim 4 further comprising a relatively thin sheet of material covering said outer surface of said wedge member and adhered thereto, said sheet having side edges respectively extending onto and adhered to said outer surface of said barrel portion on either side of said side edges of said wedge member.

6. The combination of claim 2 wherein there are two of said wedge members disposed on substantially diametrically opposite sides of said barrel portion.

7. The combination of claim 1 wherein said opening in said cover member is defined by an eyelet, and further comprising means for applying tension to the wire dispensed through said eyelet removably secured to said cover member.

8. The combination of claim 1 wherein said opening in said cover member is coaxial therewith and defined by an eyelet, said eyelet having a radially extending flange formed thereon and spaced from said cover member on the outer side thereof, and means for applying tension to the wire dispensed through said eyelet and having fingers for removably engaging said eyelet flange.

9. A wire reel comprising a cylindrical barrel portion with radially extending flanges at the opposite ends thereof, said barrel portion having at least one elongated axially extending protuberance formed on its outer surface, said protuberance being radially thicker at its end adjacent one flange than at its end adjacent the other flange and tapering therebetween.

10. A wire reel comprising: a cylindrical barrel portion with radially extending flanges at the opposite ends thereof, and at least one wedge member extending axially between said flanges and secured to the outer surface of said barrel portion, said wedge member being radially thicker at its end adjacent one flange than at its end adjacent the other flange and having its outer surface tapering uniformly therebetween.

11. The combination of claim 10 wherein said outer surface of said wedge member is outwardly curved in cross-section.

12. The combination of claim 10 wherein said barrel portion is formed of relatively thin sheet metal, said wedge member being formed of relatively thin sheet metal and having parallel side edges, said side edges being respectively integrally joined to said barrel portion, said outer surface of said wedge member being outwardly curved in cross-section.

13. The combination of claim 12 further comprising a relatively thin sheet of material covering said outer surface of said wedge member and adhered thereto, said

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sheet having side edges respectively extending onto and adhered to said outer surface of said barrel portion on either side of said side edges of said wedge member.

14. The combination of claim 10 wherein there are two of said wedge members disposed on substantially diametrically opposite sides of said barrel portion.

15. A wire shipping and dispensing package comprising: a cylindrical enclosure having an open upper end and a bottom wall defining the other end thereof; a cover member removably secured to said enclosure and closing said open end thereof; and a wire reel comprising a cylindrical barrel portion with radially extending flanges at the opposite ends thereof, said reel being removably positioned in said enclosure with one of said flanges seated on said bottom wall and with the axis of said barrel portion generally coextensive with the axis of said enclosure, the axial length of said reel being less than the axial spacing between said cover member and said bottom

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wall whereby the other of said flanges is axially spaced from said cover member, said barrel portion having at least one elongated axially extending protuberance formed on its outer surface; said cover member having an opening therein for dispensing wire from said reel.

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