May 18, 1965 B. E. ELDRIDGE 3,184,053

SHIPPING AND DISPENSING CASE FOR COILED MATERIALS

Filed June 11, 1962 3 Sheets-Sheet 1

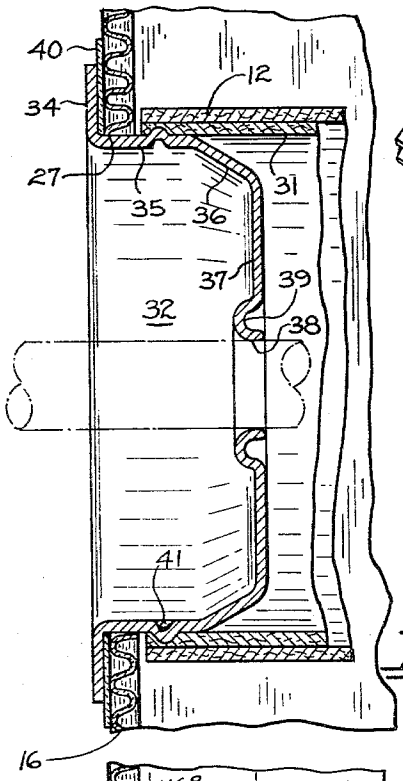


Fig. 3

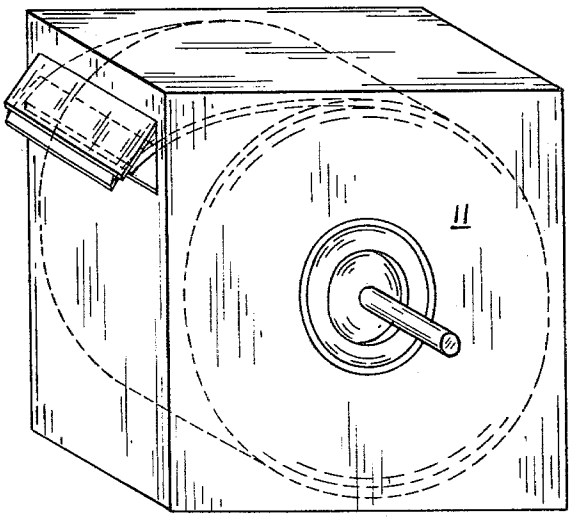


Fig. 1

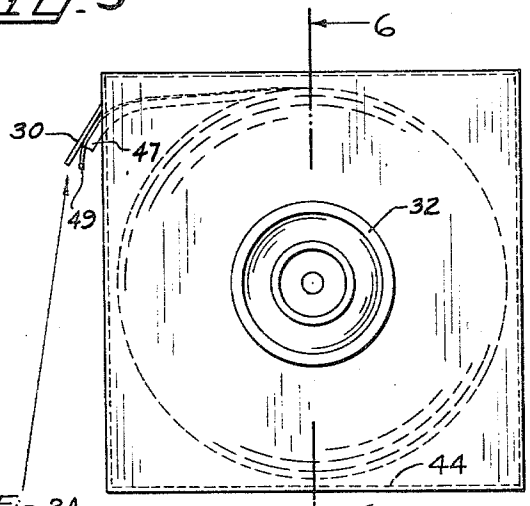


Fig. 2

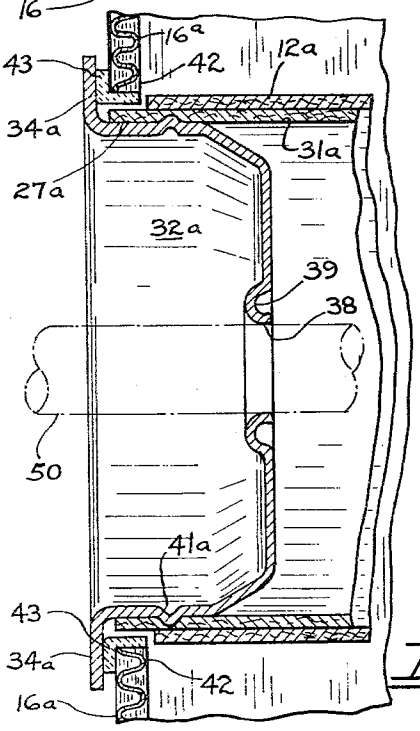
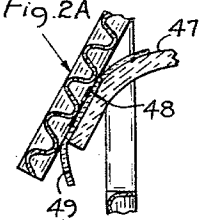


Fig. 4



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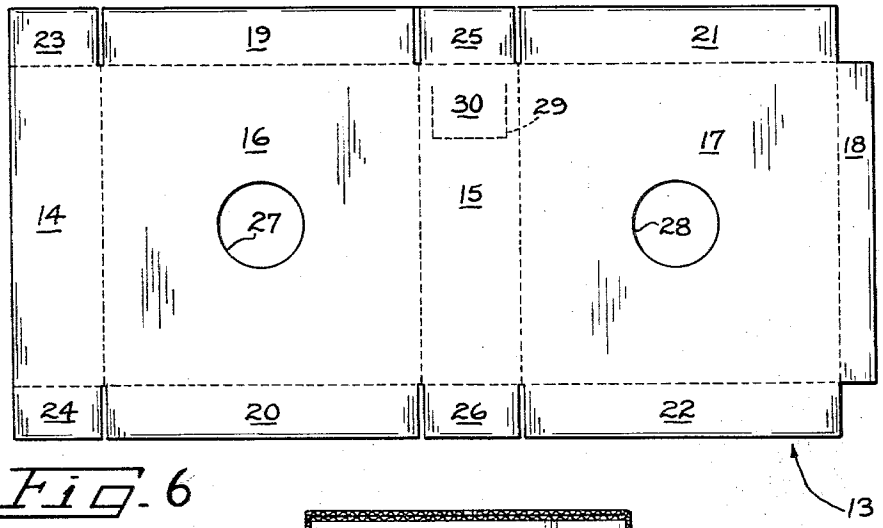


Fig. 6

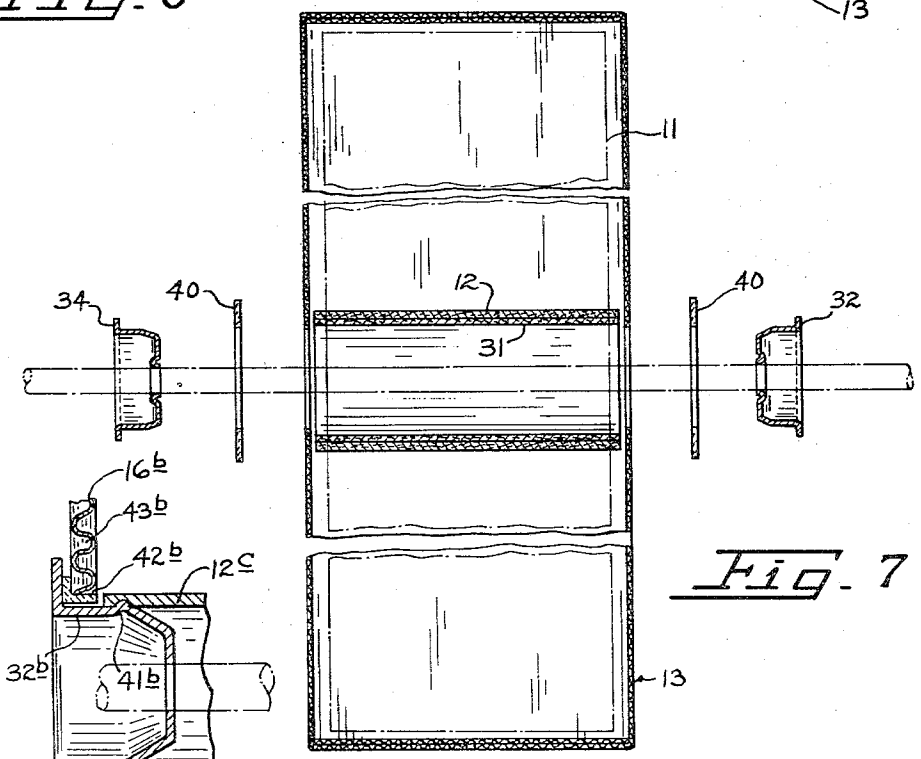


Fig. 7

Fig. 5

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SHIPPING AND DISPENSING CASE FOR COILED MATERIALS

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Fig. 8

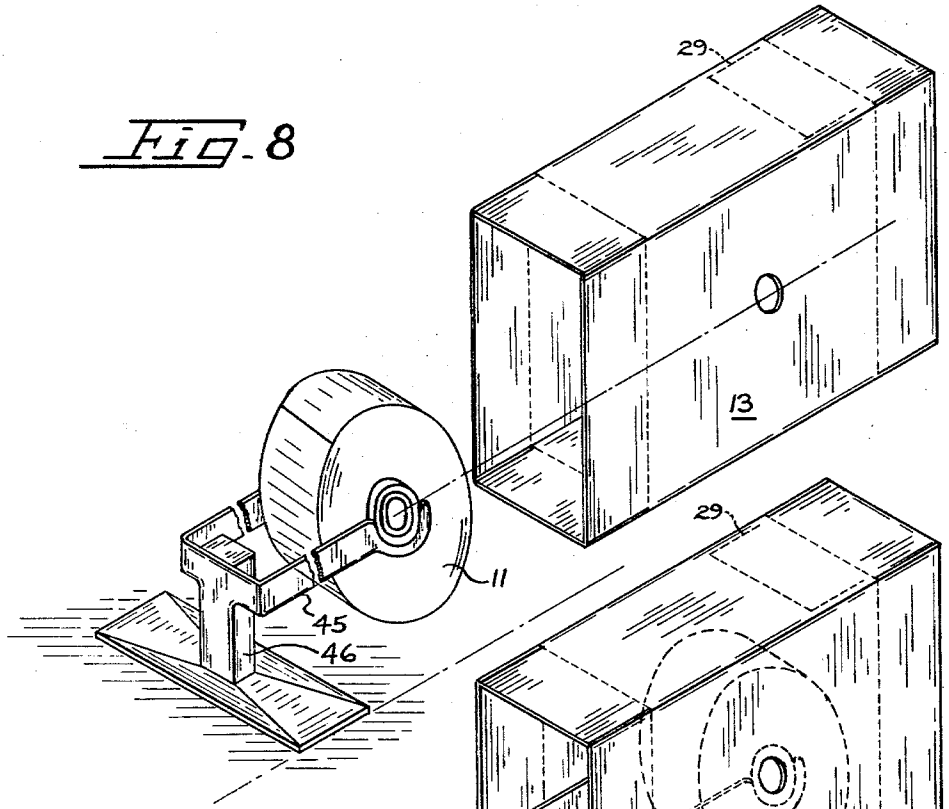


Fig. 9

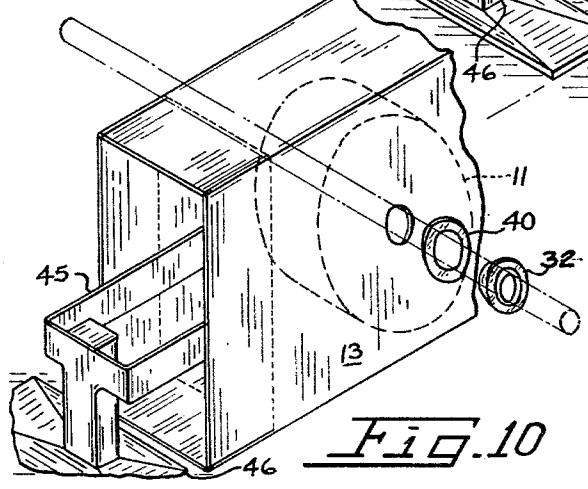


Fig. 10

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3,184,053

SHIPPING AND DISPENSING CASE FOR COILED MATERIALS

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6 Claims. (Cl. 206—52)

This invention relates generally to containers for use in shipping and storing relatively heavy lineal materials wound on a core. It also relates to a novel method for loading such coils of material within such a container and for assembling the container so that it can properly perform its various functions.

In the handling of certain flexible, but heavy and bulky materials of extended length that are arranged in coiled form, there has long been a need for a container that would not only properly support the coil of material in transit or in storage but also one which would facilitate the dispensing of the material in desired lengths when it is being used. A particularly important problem which arose with such heavy coiled materials was in providing a container that would support the coil so that it would not exert its weight on one portion of its peripheral edge. In containers heretofore used where the coil was free to move around against the walls of the container because of a lack of internal support, the material became distorted and took a permanent set by developing a flat spot on one side of the coil. This distortion either weakened the material or at least made it more difficult to handle.

The aforementioned problem was particularly serious in the case of coils of tread rubber used in recapping tires. Tread rubber material is soft and easily deformed and is generally supplied in coils of long strips to recappers. If during storage and shipment this material is allowed to rest on its side or on edge it easily acquires a distorted shape in the container. This not only makes it difficult to handle by the recapper, but it often makes it impossible to produce a perfect recapping job.

Accordingly, one principal object of the present invention is to solve the aforementioned problem by providing a unique shipping container for a relatively heavy bulky coil of strip or line material that suspends the coil of material substantially around its central axis of rotation within an enclosed package.

Another object of the invention is to provide a shipping container for heavy coils of strip material that has unusual strength and durability and which can be closed tight so that it can be kept dust and moisture free during its use when containing the coiled material.

Still another object of the invention is to provide a shipping container for a heavy coil of material which upon arrival at its destination can be used to dispense the coiled material in predetermined desired lengths as it is needed. When a reel of heavy material is once loaded into the container according to my invention it does not have to be removed from the container and remounted for use. The container can merely be positioned in any desired manner on a pipe rack or on any flat surface and the coiled material can then be unwound when needed.

Another object of my invention is to provide a shipping container for carrying heavy bulky coiled materials that is easy to assemble.

A further object of my invention is to provide a shipping container for enclosing and supporting a coiled strip of heavy bulky material so that the weight of the coil is not exerted on one side of it against a side of the container and so that the coil of material is prevented from rotating when packaged and is releasable when within the package so that it will rotate to dispense lengths of material from the coil.

Another object of my invention is to provide a novel method for loading a relatively heavy bulky coil of material within a container so that it will be rotatably supported by the container while also being enclosed by it.

Another object of my invention is to provide a shipping container for coiled materials that not only fulfills the aforementioned objects, but also is particularly adaptable for ease and economy of manufacture.

Another object of my invention is to provide a shipping container for coiled materials wherein the material can be coiled up on a reel within the container after it has been assembled.

Other objects, advantages and features of my invention will become apparent from the following description of the invention presented in accordance with 35 U.S.C. 112.

In the drawings:

FIG. 1 is a view in perspective of the shipping and dispensing container according to the present invention;

FIG. 2 is a view in side elevation of the container shown in FIG. 1;

FIG. 2A is a greatly enlarged fragmentary view in section showing in detail one means for attaching the end of the coil to an inner wall of the container;

FIG. 3 is an enlarged fragmentary view in elevation and in section showing details of one form of construction of the container in FIGS. 1 and 2;

FIG. 4 is an enlarged fragmentary view in elevation and in section showing details of a slightly modified form of construction of a container according to the present invention;

FIG. 5 is a fragmentary view in elevation and in section of another modified form of my invention utilizing a single fixed core member;

FIG. 6 is a plan view showing the box blank of the container according to the invention before it is assembled;

FIG. 7 is an exploded view in elevation and in section taken along the line 6—6 of FIG. 2 and showing the various components of the container before being assembled;

FIG. 8 is a view in perspective showing one step in the method of loading a coil of material and assembling the container according to the invention;

FIG. 9 is a view in perspective showing another step in the container loading method of the invention;

FIG. 10 is a view in perspective showing a further step in the container loading method with the roll of material secured within the container sleeve.

Referring to the drawings, FIG. 1 shows a combination shipping, storage, and dispensing container 10 embodying the principles of the invention with a coil of material 11 mounted within the container so that it is completely suspended without any of its sides or edges touching the inner sides of the container 10. While it is to be understood that my container 10 can be used for various types of coiled materials, I will describe its various components and their novel features with particular reference to the packaging of tread rubber. Thus, the coil of material 11 typifies a coil of tread rubber that is normally formed in a long strip of uniform width and thickness and coiled about a fixed paper core member 12.

My container 10 has as its basic component a box blank 13 which is shown in FIG. 6 before it is folded and assembled. For purposes of illustration, the box blank 13 is shown as the well known regular slotted carton, but I may use other box blank configurations such as one that provides a full overlap top and bottom. The box blank 13 is preferably constructed from corrugated box material of suitable strength and is cut and scored to form a pair of end panels 14 and 15 and a pair of side panels 16 and 17 which form the four sides of the container. Adjacent one of the side panels 17 is an assembly tab 18 that forms the manufacturer's joint. This member could, if desired,

be eliminated if the manufacturer's joint is formed by taping the side panel **17** to the end panel **14** rather than by stitching the assembly tab **18** to the end panel **14**. Each of the side walls and end walls has a closure section or flap at each upper and lower edge. For example, attached to the upper and lower edges of the side panels **16** and **17** are flaps **19**, **20** and **21**, **22**, respectively, and attached to the upper and lower sides of the end panels **14** and **15** are closure flaps **23**, **24** and **25**, **26**. The flaps **19**, **21** and **23**, **25** will be considered the sections forming the top closure of the container **10** and the flaps **20**, **22** and **24**, **26** will be referred to as the bottom closure sections. The side panels **16** and **17** are generally rectangular and centrally located in them are a pair of circular openings **27** and **28** which may be die-cut when the box blank **13** is formed. On one of the end panels **15** near its upper end is a U-shaped scored or perforated line **29** which can be readily fractured to form an access door **30** into the container **10** when it has reached its destination.

As stated previously, the material to be packaged is generally coiled about a fixed core member **12** of some rigid material, having a substantial diameter. According to the invention, this cylindrical roll of material **11** is mounted within the container **10** so that none of its sides touch or bear against the inner sides of the container. In order to accomplish this suspension of the heavy bulky coil of material as shown in the embodiment of FIGS. 1–3, the container **10** provides a rigid cylindrical core member **31** that extends between the side panels **16** and **17**. The core member **31** is supported at each end by a pair of cup members **32** which are made of metal, plastic or some other suitable rigid material. Each cup member **32** is an integral member having a generally circular shape with a radially outwardly extending annular flange **34** at one end. Extending at substantially a right angle from the inner diameter of the flange **34** is a cylindrical barrel portion **35** which preferably has a frusto-conical end portion **36**. The end portion **36** terminates with an inwardly annular flange portion **37** in the center of which is an opening **38**. The openings **38** on each cup **32** are preferably reinforced along their edge by a bent over circular bead **39**. The cylindrical barrel portion **35** of each cup member **32** is adapted to fit snugly within the central core member **31** and its tapered end portion **36** serves as a self-centering guide means that makes it easier for the cup members to be inserted into the core member and opening **27** and **28** during the loading and assembly of the container **10**.

To strengthen the container **10** around each cup member **32** an annular washer **40** of any suitable sheet material may be used between the outward extending radial flange **34** of each cup **32** and the container side wall **16** or **17** adjacent thereto. The washers **40** help to alleviate the stress on the box produced by the suspended reel of material by distributing it over the entire area covered by the washers **40** rather than having it concentrated at one point on the edges of the openings **27** and **28**. The washers **40** may be attached to the container walls **16** and **17** by any suitable means such as bonding them with a contact cement, thus enabling them to carry out their strengthening function. Other means could also be used to reinforce the walls **16** and **17** around the openings **27** and **28**. For example, I may apply a reinforcing strip of paper across the blank in the area of the openings **27** and **28** before they are formed.

In the form of the invention shown in FIG. 3, the cups **32** are attached to the container side walls **16** and **17** so that they do not rotate relative thereto but instead form a snug fit within the circular openings **27** and **28**. In this embodiment, after the cup members **32** are inserted into each of the circular openings **28**, **28** and into the ends of the central core member **31**, a series of radially outwardly extending dimples **41** are formed in the cylindrical sides of each cup member **32**. The dimples or protuberance **41** extend into the central core member **31**, locking the cup members **32** to its ends just inside the side walls **16**, **17** of the container **10**.

In some instances it may be highly desirable to be able to rotate the reel of material from outside the container, by providing a rigid connection between the cup members and the fixed core of the reel. This feature is accomplished by the modified form of the invention shown in FIG. 4. Here, the central core **31***a*, which originally is slidably fitted into the fixed core **12***a* of the reel of material, is preferably longer than the core **31** in FIG. 3 and extends to the outer surface of the side panels **16***a*, **17***a* of the container **10***a*. The circular openings **27***a* and **28***a* in the side walls **16***a*, **17***a* have a larger diameter and are preferably reinforced by annular bearing rings **42**. The members **42** which may be made from any suitable rigid material such as an inexpensive plastic, have a width somewhat greater than the side walls **16***a*, **17***a* of the container and a radial flange portion **43** that is preferably bonded to the container wall around the openings **27***a* and **28***b*. The inside diameter of the member **42** is somewhat greater than that of the core **31***a* but less than that of the fixed core **12***a* of the reel of material. With the cup members **32***a* fitted snugly within the ends of the core member **31***a* there is a running annular clearance between the bearing members **42** and the core member **31***a*. In this arrangement, the cup members **32***a* are staked at spaced apart intervals to form radially extending detents **41***a* that connect the cup members **32***a* to *both* the core member **31***a* and the core **12***a*. Thus, the cup members **32***a* are rigidly fixed to the reel of material in the container and they can be rotated relative to the container so that by using a suitable means a torque can be applied to the cups to wind-up the reel inside the container.

A further modification of my invention is shown in FIG. 5 wherein a pair of cup members **32***b* are fitted directly into and rigidly fixed by means of staked detents **41***b* to the fixed core **12***b* of a reel of material. Thus, in this arrangement, no central core member such as **31***a* is used. Here again, as in the modification of FIG. 4, bearing members **42***b* are supplied to reinforce the openings **27***b* and **28***b* in the container side walls and to furnish bearing surfaces for the cup members **32***b*.

An important aspect of my invention is the novel method by which the heavy rolls or coils **11** of material such as tread rubber are loaded into the container **10** as it is being assembled. This method is best shown by FIGS. 8–10. In the first step of the method, illustrated in FIG. 8, the roll of tread rubber material **11** having a fixed core member **12** and a loosely fitting central core member **31** is supported at the ends of its fixed core member **12** by a pair of narrow spaced apart cradle members **45**. The cradle members **45** are attached to some suitable frame device **46** and are thereby supported on the floor near their ends. In a production line loading system the members **45** may comprise the end portions of a support rack on which a plurality of rolls may be mounted in readiness for being packed.

With the roll **11** supported as described, a box blank **13**, folded and connected to form an open sleeve, is placed over the roll **11** and the supported cradle members **45** as shown in FIG. 9. The box sleeve is positioned so that the circular box openings **27**, **28** are in register with the ends of the loosely fitting central core **31** placed inside the fixed core **12** of the roll **11**.

In the third step of the method (FIG. 10), the cup members **32** are driven axially into the box openings **27** and **28** and into the ends of the central core **31**, the washers **40** (or bearing members **42**) being first placed between the cup member outer flanges **34** and the sides **16** and **17** of the box.

The fourth step of the method is best shown by reference to FIG. 3 or 4 and involves the staking of the cups **32** to form the radially extending dimples **41** which lock the cups **32** firmly to the central core member **31**, as shown in FIG. 3, or also to the fixed core member **31***a*

as shown in the modification of FIG. 4. This dimpling or staking step can be done rapidly by mechanical means almost simultaneously with the insertion of the cups 32 into the central core member 31.

As shown in FIGS. 1 and 2, another feature of my invention is that although the roll of bulky heavy material 11 is suspended within the container 10 it can be prevented from rotating therein when packaged for shipment and handling. Also it can be easily released for rotation when it is desired to remove some of the material from the container. This feature is accomplished in a fifth step of my method which is to attach the free end 47 of the coil material 11 to the inside surface 44 of the end wall 15 of the container and preferably at the access door 30 formed by the perforated line 29. Any suitable means can be used to attach the free end 47 of the roll 11, but I prefer to use a series of spaced apart drops 48 of contact cement of any suitable type (see FIG. 2A). At the free end 47 of the roll of material a lifting tab 49 is provided that extends away from the inside surface 44 and can be readily grasped and torn loose when the access door 30 has been opened.

In the sixth and final step of the method, the container 10, with the roll of material 11 now firmly retained within the box sleeve, is removed from the cradle members 45 and the end closure flaps are folded to the closed position and sealed by the conventional means.

When the container 10, according to my invention, is received by the consumer it can be placed in the desired position such as on a rack or on a pipe 50 extending through the openings 38 in the cups. The access door 30 is then fractured and opened to provide access to the free end 47 of the material 11. When this is done, with the box 10 properly in position, the end 47 of the coil of material can be easily torn loose from its fixed position on the access door 30 and the desired length of material can be removed and used, leaving the remainder of the material still coiled within the box and protected from dirt and moisture.

With my invention it is also possible to load a container after it has been assembled by winding it up on a core that is retained within the container. For example, a container structure similar to that of FIG. 4 could be used. In the case of tread rubber, the stock could be connected directly at one end to the fixed core 31*a* and a torque could be applied to rotate the attached cups 32*a*. Or, another method (not shown) would be to wind the material on a core supported by mandrel extended within the assembled container, after which the mandrel would be removed as the cups are installed in the core in accordance with the invention as previously described. The foregoing serves to illustrate the unusual versatility of my unique container.

To those skilled in the art to which this invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope of the invention. The disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

I claim.

1. A shipping and storage container for retaining a coil of relatively heavy material having a uniform width and thickness comprising: a box member including a pair of opposite end panels, a pair of opposite side panels, and enclosure means connected to said end panels and side panels, said side panels having axially aligned circular openings therethrough; a cylindrical central core extending between said openings; and a pair of cup members extending through said openings and also within the ends of said central core to retain the central core within said box, said central core being slidably disposed within the fixed core of a coil of said heavy material; whereby said coil of material is completely suspended within said container and supported about its fixed core.

2. A shipping and storage container for retaining a coil of relatively heavy material having a uniform width and thickness comprising: a box blank, said blank being slotted, scored, and folded to form a box member including a pair of opposite end panels, a pair of opposite side panels, and enclosure means connected to said end panels and side panels, said side panels having centrally located and axially aligned circular openings therethrough; a cylindrical central core extending between said openings; a core cup member in each of said openings and engaged in an end of said central core to retain it within said box, said central core being disposed within the fixed core of a coil of said heavy material; means on the inner surface of one of said end panels of said box for retaining the end of said coiled material in a fixed position; and an access door in a said end panel adjacent to said end of the coiled material; whereby said coil of material is completely suspended within said container and supported about its fixed core.

3. A shipping and storage container for retaining a coil of relatively heavy material having a uniform width and thickness comprising: a box blank of corrugated paperboard material, said blank being slotted, scored, and folded to form a box member including a pair of opposite end panels, a pair of opposite side panels, and enclosure means connected to said end panels and side panels, said side panels having centrally located and axially aligned circular openings therethrough; a tubular central core extending between said openings; a pair of core cup members, each having a radially extending flange and an axial body portion disposed snugly in one of said openings and also in the ends of said central core to retain it within said box, radially extending detent means for securing said cup members to said central core; said central core being retained within the fixed core of a coil of said heavy material; whereby said coil of material is completely suspended within said container and supported about its fixed core.

4. A shipping and storage container for retaining a coil of relatively heavy material having a uniform width and thickness comprising: a box blank of corrugated paperboard material, said blank being slotted, scored, and folded to form a box including a pair of opposite end panels, a pair of opposite side panels, and enclosure means connected to said end panels and side panels, said side panels having centrally loacted and axially aligned circular openings therethrough; a cylindrical central core extending between said openings; a pair of core cup members, each said cup member having a radially outwardly extending flange at one end, a cylindrical body portion, and a radially inwardly extending flange at the other end of said body portion forming a central opening, each said cup member extending through one of said box openings and also within one end of said central core to retain it within said box; said openings in said box side panels having a greater diameter than the diameter of the body of said cup members but less than the diameter of said outwardly radially extending flange; detent means for securing said cup members to said central core, said central core being within the fixed core of a coil of said heavy material; whereby said coil of material is completely suspended within said container and supported about its fixed core.

5. A shipping and storage container for retaining a coil of relatively heavy material having a uniform width and thickness comprising: a box blank of corrugated paperboard material, said blank being slotted, scored, and folded to form a box including a pair of opposite end panels, a pair of opposite side panels, and enclosure means connected to said end panels and side panels, said side panels having centrally located and axially aligned circular openings therethrough; a cylindrical central core extending between said openings; a pair of core cup members, each said cup member having a radially outwardly extending flange at one end, a cylindrical body portion, and a radially inwardly extending flange at the other end

of said body portion forming a central opening, each said cup member being disposed snugly in one of said box openings and also in the end of said central core to retain the latter within said box, said openings in said box side panels having a diameter substantially equal to the diameter of the body of each of said cup members, said cup members being thus substantially fixed relative to said box; detent means for securing said cup members to said central core, said central core extending through the fixed core of a coil of said heavy material; whereby said coil of material is completely suspended within said container and supported about its fixed core.

6. A shipping and storage container for suspending a coil of relatively heavy material about its rotational axis within the container comprising: a box member including a pair of opposite end panels, a pair of opposite side panels, and enclosure means connected to said end panels and side panels, said side panels having axially aligned circular openings therethrough; tubular core means comprising an outer core member fixed within said coil and a longer inner core member disposed within said outer core member extending between said openings and supporting said coil of material within said container; annular bearing members attached to said side panels around said openings; a pair of cup members with an outwardly radial flange fitted loosely in each of said openings but snugly in the ends of said inner core member to retain it within said box; and a plurality of radially extending detent

members rigidly connecting said cup members to said inner core member; whereby said cup members are rotatable relative to said container when said coil is rotated.

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