July 29, 1947. J. D. CONTI 2,424,553

PACKAGE OF ROLLS OF SHEET MATERIAL

Filed Jan. 5, 1944

Fig. 1.

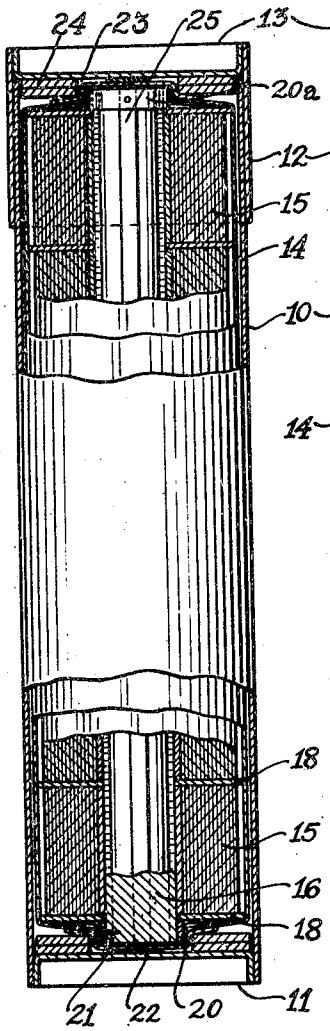


Fig. 3.



Fig. 4.

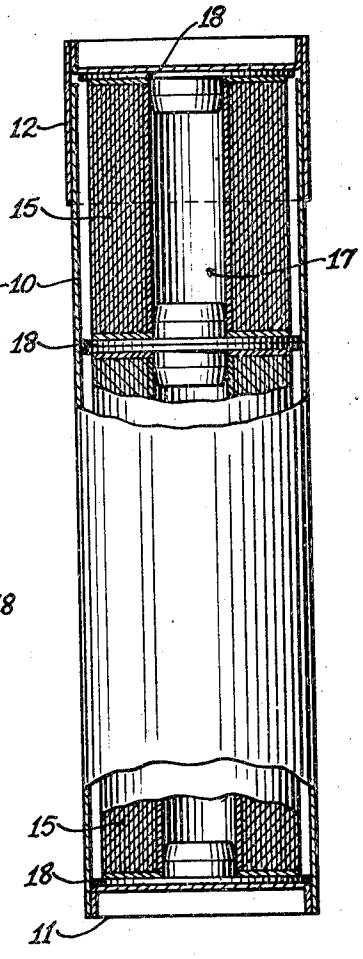


Fig. 5.

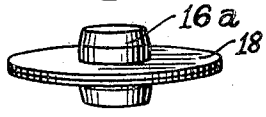
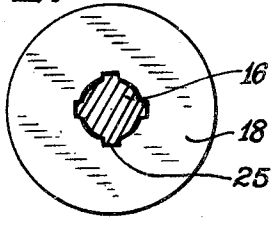


Fig. 2.



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PACKAGE OF ROLLS OF SHEET MATERIAL

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Application January 5, 1944, Serial No. 517,007

5 Claims. (Cl. 206—52)

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This invention relates to a container for packaging and shipping rolls of sheet material and, in particular, relates to a package for slitted rolls of non-fibrous sheet material.

In the art to which this invention appertains the term "slitted" roll means a roll of sheet material of relatively narrow width, usually a fraction of the width of the full-sized roll as manufactured, and the term "slitted" roll is used herein in that manner.

When slitted rolls of non-fibrous material such as Cellophane are packaged and shipped according to prior methods, the rolls are separately wrapped or they are loosely packed in a common container, in which they are subject to movement which often causes them to telescope, i. e., the center of the roll slips out of alignment with the circumference of the roll. In the case of slitted rolls of Cellophane, this telescoping tendency is emphasized both because of the extreme smoothness of the Cellophane and because of the narrowness of the roll which also reduces the resistance to slide. Thus when slitted rolls of Cellophane are shipped in a loose container even a slight impact is sometimes sufficient to cause the roll to telescope. In extreme cases of telescoping the center core of the roll becomes disengaged from the sheet material and thus permits the roll to unravel from the center and become irreparably tangled. Even when telescoping does not progress to such an extreme condition, serious damage may easily be caused inasmuch as a partially telescoped roll is more subject to damage on the edges of the sheet material and will not feed properly in automatic wrapping machines. It is well known in the Cellophane art that an unbroken edge offers great resistance to tearing but the presence of a break in the edge renders Cellophane extremely susceptible to tearing. It is obvious, therefore, that the above-described condition must be avoided, and that there is great need for a method of packaging and shipping slitted rolls which prevents damage to the edge of the sheet material.

An additional problem has arisen in the packaging and storing of slitted rolls of moistureproof Cellophane. Moistureproof Cellophane normally has on its surface a thermoplastic coating, adjacent layers of which tend even at low temperatures under long continued pressure to coalesce and stick together. It is apparent, therefore, that if a roll of moistureproof Cellophane is permitted to lie on its circumference for an extended period of time, the various layers of the Cellophane will ultimately adhere to

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each other. If such a roll is then passed through high speed machinery the probability is very great that the sheet will be torn.

When slitted rolls are individually wrapped in paper or the like they are packed into a box or other similar container for shipping. When such a method of packing is used the rolls are somewhat loose and subject to movement and accordingly the rolls frequently become telescoped. Likewise the easy movement of the rolls permits pressure to be exerted against the circumference of the rolls with the consequent adhesion between layers of the sheet material. In addition, the flimsy nature of the wrapping fails to protect the rolls from damage.

An object of my invention is to provide a container for packaging and shipping rolls of smooth non-fibrous sheet material.

Another object of my invention is to provide a container for packaging and shipping rolls of Cellophane, and in particular to provide a container for packaging and shipping slitted rolls of Cellophane.

A still further object of my invention is to provide a container for packaging and shipping slitted rolls of moistureproof Cellophane.

Other objects of my invention are in part obvious and in part will become apparent from the following description.

According to my invention a plurality of slitted rolls of sheet material having hollow cores are packaged in a common container comprising a cylinder, an arbor passing through the cores of the rolls, disks positioned between the individual rolls, said disks co-acting with the arbor and the cylinder to suspend the rolls from the cores.

The term "arbor" as used hereinafter throughout the specification and the claims refers to a relatively long, substantially round bar consisting either of one unitary piece or of a plurality of segments more or less firmly fastened together.

Accordingly, my invention comprises the article having the elements and the relation of elements one to another as described in the following description and in the drawing in which:

Figure 1 is a side view partly in section of one embodiment of the container.

Figure 2 is a top plan view of a roll-separating disk and arbor according to one embodiment of my invention.

Figure 3 is a cross section of the container of Figure 1 showing a portion of the contents removed.

Figure 4 is a side view partly in section of a second embodiment of the container.

Figure 5 is a perspective view of a disk and a section of the arbor used in one embodiment of my invention.

The main container is preferably a cylinder 10, the construction of which will vary depending on the nature of the rolls to be contained therein, and the choice of a suitable construction material will be obvious to one skilled in the art. When my container is being used for the packing and shipping of slitted rolls of moistureproof Cellophane, I prefer to use a cylinder of stiff cardboard or chipped board although a container formed of a metallic or plastic material will be satisfactory.

Generally this cylinder will be closed at the lower end 11 and provided with a removable cap 12 at the other end 13, although it will be obvious that removable caps may be provided at both ends. A satisfactory closure has been described in co-pending application of Harry S. Brown, Serial No. 421,591 filed December 4, 1941 which has matured into Patent No. 2,354,498.

Within the cylinder 10 there is provided in that embodiment shown in Figures 1, 2 and 3 a protective liner 14, the nature of which may be varied according to the contents. For example, when rolls 15 of Cellophane are to be packaged in my container this protective liner is preferably moistureproof and waterproof. A suitable liner comprises a laminated sheet of waxed paper and moistureproof Cellophane surrounding the contents of the container. Another suitable liner comprises a moistureproof and waterproof coating applied to the inner surface of the cylinder 10 such as, for example, a coating of a cellulose derivative, wax, rubber, a synthetic resin and the like.

To prevent movement of the slitted rolls 15 lengthwise of the container 10 there is provided an arbor which, according to one embodiment of my invention comprises a long rigid bar suitably constructed of wood, metal, a hard plastic material. It is contemplated that this arbor may be a unitary bar 16 as shown in Figure 1 passing through the centers of the rolls, or that it may be composed of a plurality of strips laminated together to form a continuous bar. In another embodiment the arbor comprises a plurality of short sections 16*a* adapted to fit tightly into the cores 17 of the rolls 15 and thus the sections and the cores together comprise the arbor.

To prevent transverse movement of the rolls, disks 18 of a slightly larger diameter than the diameter of the rolls are placed between the rolls 15 so that the edges of the disks extend beyond the edges of the rolls. The disks 18 are substantially rigid and flat and may be formed of material similar to that of the cylinder 10. They may be free to revolve around the arbor but preferably fit snugly and are firmly fixed in position. According to one embodiment of my invention where the arbor consists of sections 16*a*, it is contemplated that the disks 18 may be integrally attached to adjacent sections 16*a* to form the article illustrated in Figure 5.

According to another embodiment shown in Figure 2, the arbor 16 of Figure 1 is provided with projections 25 running lengthwise thereof and the disks may be provided with corresponding notches adapted to engage the said projections thereby preventing the disks from revolving.

The disks 18 have a dual function in the container in that (*a*) they prevent telescoping of the rolls, and (*b*) serve to suspend the rolls from their centers or cores. Thus, the disks pressed firmly against each end of a roll completely eliminate the tendency of the roll to telescope and thereby provide adequate protection for the edges of the sheet material. In addition, the disks, having a diameter greater than that of the roll, in conjunction with the arbor serve to prevent the roll from resting on its circumference and thereby prevent the exertion of pressure on the circumference of the roll with the subsequent adhesion of adjacent layers.

In assembling the container there is selected an arbor having a length slightly greater than the total length of the several slitted rolls when stacked edge to edge. There is first applied to the lower end of the arbor a collar 20 which is fixed to the arbor by suitable means such as nails 21. A disk 18 is then slipped over the arbor and allowed to rest upon the collar 20. A slitted roll is then slipped over the arbor following which another disk 18 is added, and this is repeated until all the rolls are in position as shown in Figure 1. Thereafter there is applied to the projecting upper end of the arbor a second collar 20*a* which is also fixed to the arbor by suitable means such as nails 21. Thereafter the arbor carrying the plurality of rolls is wrapped or inserted in the liner 14, the ends of the liner being folded over the ends of the roll, and finally a paper disk 22 is applied over the folded ends of the liner. The package thus produced is inserted in the cylinder 10 so that the upper and lower collar fit into recesses 23 formed by the blocks 24 which are attached to the inner surface of the enclosure 11 and the cap 12. The cap is then pressed down firmly over the end of the roll so as to apply pressure to the packaged rolls, the cap being held in place by suitable means such as staples. It should be noted that in Figure 4 the liner is omitted and that pressure is applied to the stacked rolls by forcing the cap 12 against the top disk 18 thus preventing movement of the rolls longitudinally of the container.

When the container arrives at the place of use the cap 12 is removed, the wrapped rolls are removed from the cylinder 10, the lower end of the liner 14 is opened, the collar 20 is removed, the liner is then folded back against the end, the rolls are then placed back into the container. Thereafter the upper end of the liner 14 is opened and the arbor 16 is completely withdrawn. The rolls may now be removed one at a time, and after such removal the upper end of the liner 14 may be closed by folding or twisting as shown in Figure 3. In that embodiment shown in Figure 4 when the cap 12 is removed the rolls may be removed individually without first removing all the rolls because the arbor is not continuous.

Figure 5 shows a segment of the arbor used in the embodiment shown in Figure 4. This segment comprises two disks 18 fastened firmly together and provided with two round projections fastened integrally thereto. The diameter of these projections is roughly the same as the internal diameter of the cores of the rolls, thereby preventing movement of the rolls transverse of the container.

Numerous variations in the construction of my new container will be obvious to those skilled in the art. For example, the lock collar shown in Figure 1 may be an integral part of either or both ends of the container. Thus it has been found valuable in many instances to provide at the bot-

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tom of the container a depression into which the arbor may be snugly fitted. In this way the arbor becomes firmly fastened to the outer container and thus motion of the contents during shipping is further restricted. Likewise the arbor which is shown in the various figures as being substantially round may be irregular in shape and the disks between the rolls may similarly be irregular in shape and thus prevent it from revolving.

My new container has been particularly described with reference to its use as a container for slitted rolls of Cellophane. However, it is to be understood that it is equally adaptable for use in packaging and shipping rolls of other sheet materials. Thus, for example, it would provide a satisfactory container for packing and shipping rolls of paper, cloth, and the like.

Numerous advantages of my new container will become obvious from a study of the foregoing description and from a consideration of the practical problems arising in the packing and shipping of rolls of sheet material. My new container provides a convenient, secure, and economical method for packing and shipping rolls of sheet material. Rolls packed in this container are prevented from telescoping and from the damage caused thereby. The construction of my container prevents undesirable pressure from being exerted on the circumference of the roll and thus helps prevent adhesion between rolls of the sheet material as well as protecting the contents from damage during shipping. The container also minimizes drying out of Cellophane or other sheet material which may be packed in the container even after the container is opened and part of the contents removed and prevents contamination. Other advantages will also be evident from the hereinabove description.

It is to be understood that the foregoing description of my invention is merely illustrative and that my invention is not to be limited in scope to this description.

I claim:

1. A shipping package for nonfibrous sheet material comprising a roll of nonfibrous sheet material having a hollow core, an arbor passing through said core and projecting therefrom at each end stiff perforate disks of diameter larger than the roll threaded on the arbor adjacent each end of the roll, a lock collar secured to each projecting end of the arbor and pressing securely

against the disks, a protective liner of nonfibrous sheet material completely enclosing the roll, arbor, disks and collars, its ends folded over and closely wrapped about the projecting ends of the arbor, a lock disk inserted over each wrapped end of the arbor securing the liner against the arbor and preventing its loosening and unwrapping, and a protective outer cylinder having covers at each end adjacent the lock disks enclosing said liner and contents, the stiff perforated disks within the liner closely fitting the walls of the cylinder through the liner, preventing movement of the nonfibrous sheet material roll within the cylinder.

2. A shipping package for nonfibrous sheet material in accordance with claim 1 in which the liner is formed of a laminate of Cellophane and kraft paper, the Cellophane surface contacting the nonfibrous sheet material roll, and the kraft paper surface contacting the inner wall of the cylinder.

3. A shipping package for nonfibrous sheet material in accordance with claim 1 in which the lock disk is integral with the cover of the protective outer cylinder.

4. A shipping package for nonfibrous sheet material in accordance with claim 1 in which a plurality of rolls separated from each other by a stiff perforate disk are enclosed by the liner.

5. A shipping package for nonfibrous sheet material in accordance with claim 1 in which a means is provided upon the arbor adapted to reciprocate with a corresponding means upon each stiff perforate disk and prevent rotation of the disks about the arbor.

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