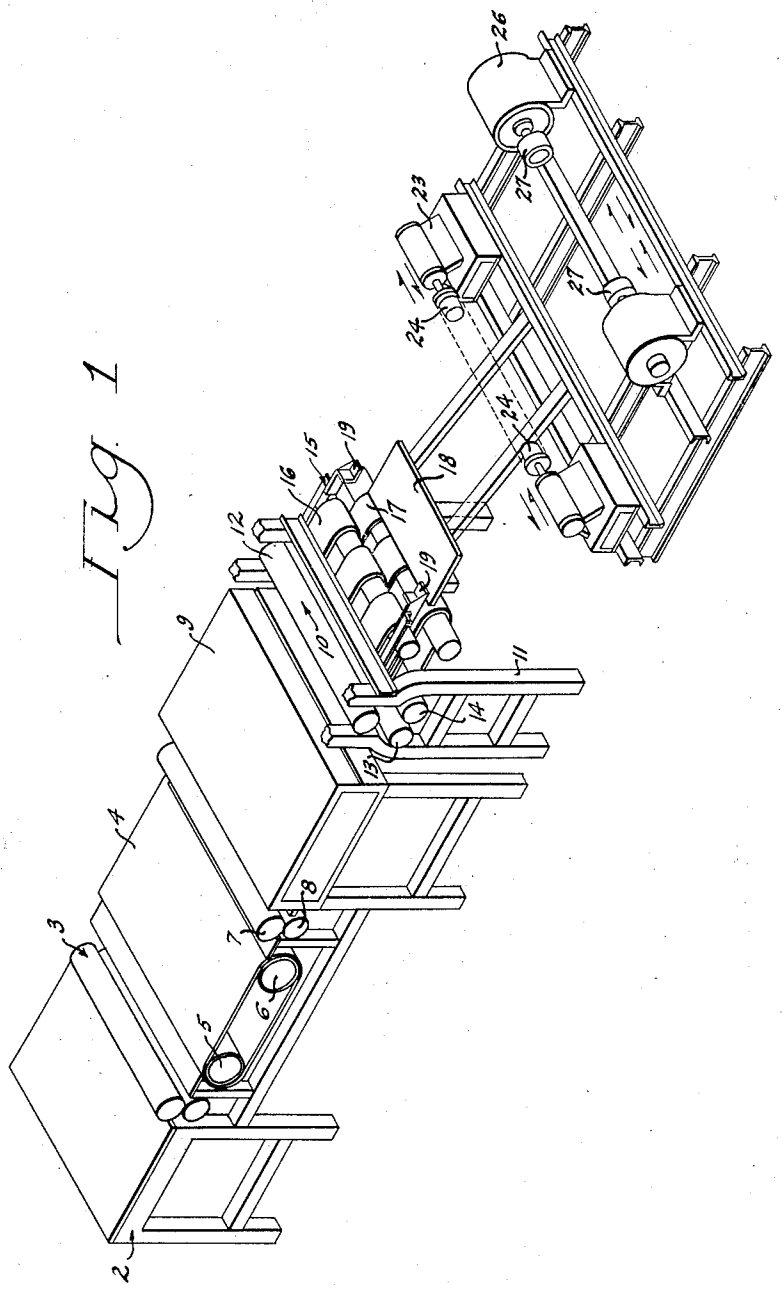
Jan. 14, 1936. C. F. HAWKER 2,027,381

METHOD OF PACKAGING ROLLED ARTICLES

Original Filed March 16, 1932 3 Sheets-Sheet 1

Fig. 1



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METHOD OF PACKAGING ROLLED ARTICLES

Original Filed March 16, 1932 3 Sheets-Sheet 2

Fig. 2

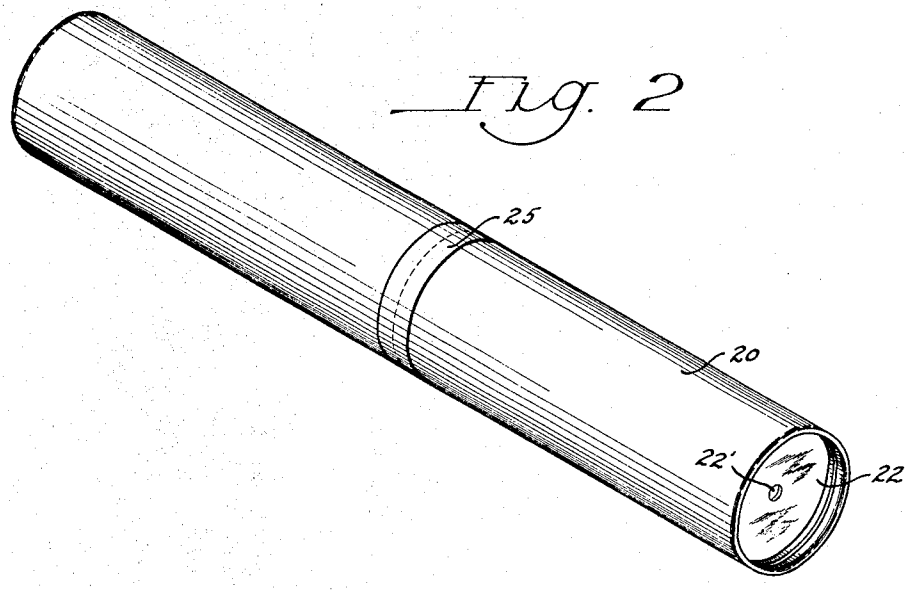
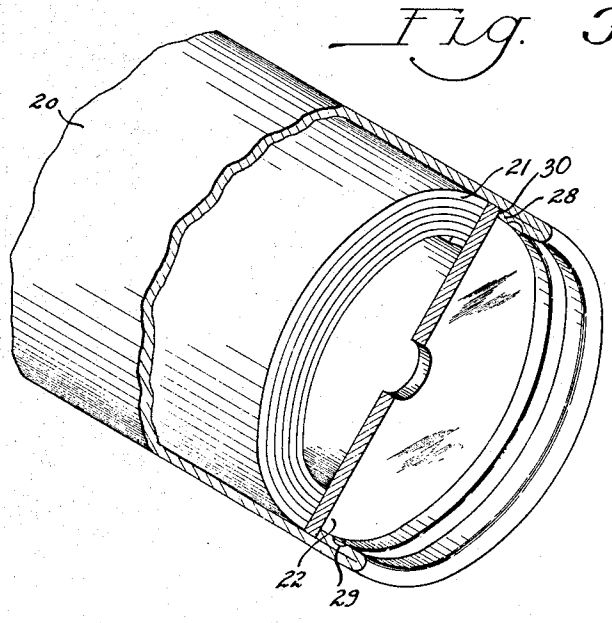


Fig. 3



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METHOD OF PACKAGING ROLLED ARTICLES

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Fig. 4

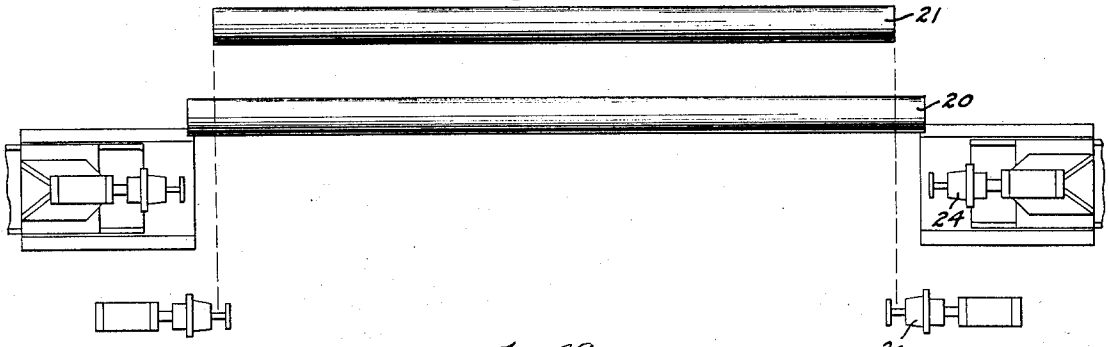


Fig. 4a

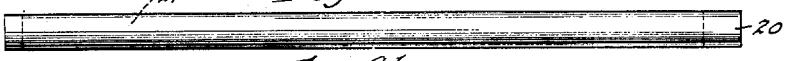


Fig. 4b

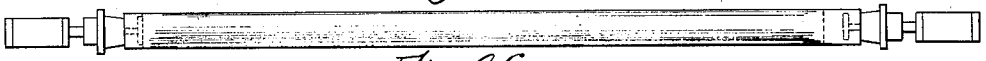


Fig. 4c

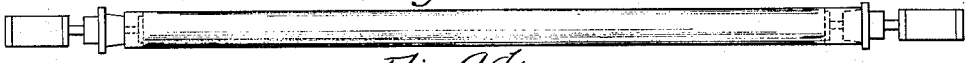


Fig. 4d



Fig. 4e



Fig. 5

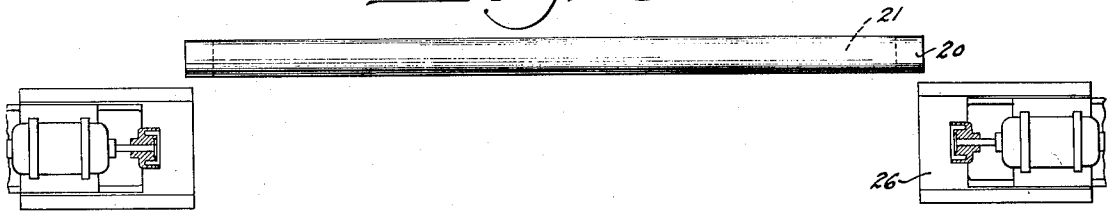
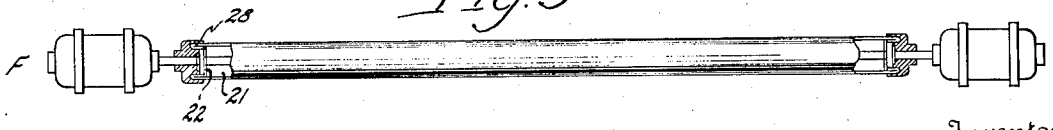


Fig. 5a



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UNITED STATES PATENT OFFICE

2,027,381

METHOD OF PACKAGING ROLLED ARTICLES

Clifford F. Hawker, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa., a corporation of Pennsylvania

Original application March 16, 1932, Serial No. 599,217. Divided and this application July 24, 1934, Serial No. 736,683

10 Claims. (Cl. 93—5)

This application is a division of my copending application Serial No. 599,217 filed March 16, 1932.

This invention relates to a method of packaging rolled articles and more specifically to a method of packaging felt base rugs or other hard surface coverings which are substantially incompressible in a direction parallel to the direction of rolling, although my method may be employed for packaging other rolled articles.

Rugs of the felt base type comprise a sheet of felt saturated with asphalt or any suitable saturant, and generally have a decorative design printed on one face thereof. Heretofore, in packaging rugs of this type, it has been necessary to roll said rugs on a comparatively large diameter and then cover the rolled rug with an outer wrapper of paper. The rugs cannot be rolled on a smaller diameter because of the susceptibility of the felt and the paint to crack. In cases of felt of inferior quality, it was necessary to increase the size of the roll even more than usual. This added the disadvantage of non-uniform size to the other disadvantages of the completed packages.

It is an object of my invention to provide a method of packaging rugs of the felt base type which will result in completed packages which are relatively small and of uniform size. It is a further object of my invention to provide a method of forming a completed rug package that will have a neat appearance, will be durable, and will protect the rug from injury during transit. Other objects of my invention will become apparent upon reading the annexed specification taken in connection with the accompanying drawings, in which

Figure 1 is an assembly layout, in diagrammatic form, of an apparatus which may be used to carry out my method;

Figure 2 is a perspective view of my complete package;

Figure 3 is a fragmentary perspective view of one end of my completed rug package; and

Figure 4 illustrates diagrammatically a rolled rug, an enclosing tube therefor and a centering mechanism at the outermost and innermost limits of its movement;

Figures 4*a*, 4*b*, 4*c*, 4*d*, and 4*e* are diagrammatic views showing various positions of an enclosed rolled rug with respect to the enclosing tube, and the progressive movement of the centering mechanism;

Figure 5 is a diagrammatic view of the rolled rug positioned centrally in the enclosing tube and showing a crimping mechanism at the outermost and innermost limits of its movement; and

Figure 5*a* illustrates diagrammatically the engagement of the ends of the enclosing tube by the heads of the crimping mechanism.

The apparatus shown in the drawings is illustrated in detail and described in my copending joint application with Benjamin F. Herr and Fred G. Rottmund, Serial No. 599,216, filed March 16, 1932.

In Figure 1, the reference numeral 2 indicates an inspection table upon which a plurality of felt base rugs or other articles (not shown) to be packaged are stacked. The rugs are passed individually through a trademarking machine 3 which prints suitable indicia on the bottom surface of the rug. A belt conveyor 4 moving over a pair of rolls 5 and 6 carries individual rugs from the trademarking machine to a pair of pinch rolls 7 and 8. The pinch rolls 7 and 8 are effective to move the rug through a conditioning chamber 9. The conditioning chamber is particularly adapted to aid in packaging rugs when the temperature in the room is so low that the rugs are too stiff to be bent easily. The conditioning chamber is heated by steam or any other suitable means so that the rugs passing through the chamber may be heated to approximately 100° F. The amount of heat applied to the conditioning chamber will depend upon the outside temperature.

The rug passes from the conditioning chamber 9 to a roll-up device 10 which consists of a suitable frame 11 in which are mounted an upper roll 12 and two lower rolls 13 and 14. The roll 12 is raised and a thin wooden core is placed between the rolls 13 and 14. The roll 12 is then lowered so that it rides on top of the core. The end of the rug to be rolled is secured to the core by means af a fabric apron and the rolls 13 and 14 are driven in a counter-clockwise direction, as viewed in Figure 1. The roll 12 which rests on top of the core, is an idler.

When the rug has been rolled up it is moved out of the roll-up machine by a rug expelling device 15. The rug expelling device includes a pair of belt conveyors 16 and 17 disposed one above the other with a space therebetween sufficient to accommodate a rolled rug and to maintain it under slight compression so as to prevent unrolling. The conveyors 16 and 17 move the rolled rug onto a plate 18. A pair of spring clamps 19 engage opposite ends of the rolled rug to prevent it from unrolling while a tube is being placed thereover.

I prefer to package the rolled rug in a paper tube 20 formed in two sections. One section of the tube is slipped over each end of the rolled rug until the two sections meet. The inner surface of the tube is oiled or waxed to facilitate sliding the sections of the tube over the rug without injuring the finish of the packaged rug. Any suitable tube may be used, but I prefer a 5-ply paper tube because of the protection it affords the packaged rug during shipment and subsequent handling operations. After the tube has been placed around the rolled rug 21, the tendency of the rug to unroll causes the rug to expand slightly and to press against the walls of the tube. After this expansion, the mandrel upon which the rug has been rolled is removed and a plywood disk 22 is placed in each end of the tube. These disks are provided with a small hole 22' in the center thereof to allow the escape of air in the tube when the disks are pressed flush against the ends of the rug.

Since the tubes are placed over the rolled article by hand it is difficult to position the article centrally of the abutting tubes and for that reason, the rolled rug 21, now confined in its tube 20 is placed in a centering machine 23. The centering machine comprises a pair of centering heads 24 that are moved into the open ends of the tube 20 to press the disks 22 flush against the ends of the rug 21 and to center the rolled rug in the tube. The centering heads 24 are rotatable, so when the tube is supported thereon a strip 25 of adhesive paper or any similar material may be applied over the joint between the sections of the tube.

The tube and its rolled rug is then moved to a crimping machine 26. The crimping machine includes a pair of crimping heads 27 adapted to engage the ends of the tube and crimp them inwardly into beads as indicated generally at 28, Figure 3, forming abutments 30. The ends of the paper tube are oiled prior to use to lubricate them so that the ends may be turned inwardly without breaking or burning. The ends of the tube are turned inwardly and the crimping heads working simultaneously against the opposite ends of the tube force the ends against the disks 22 which have been forced into engagement with the ends of the rolled rug by the centering heads 24. The crimping action may be continued for an instant after the ends of the tube are pressed flush against the disks. This extra pressure results in the formation of a groove or depression 29 in the bead 28. The groove 29 has a reenforcing effect on the end of the tube and adds greatly to the rigidity of the package. The combination of the disk 22 and the inwardly crimped or beaded portion 28 of the tube forms a rigid end structure which serves to retain the rug in position within the tube, preventing any substantial longitudinal movement thereof. By crimping the ends of the tubes after positioning the article therein, the beads 28 formed by the action of the crimping heads 27 are forced into firm engagement with the disks 22, which disks are in turn urged into firm engagement with the rolled article 21; the disk 22 being thereby clamped between the rolled article and the bead and longitudinal movement of the article being thereby prevented.

The action of the centering and crimping mechanism of my joint application Serial No. 599,216 above referred to is illustrated in Figures 4 to 4e inclusive, 5 and 5a. Referring first to Figure 4, the rug 21 and the tube 20 are shown with centering heads 24; the dotted lines indicating that normally the heads 24 move inwardly to a position with the distance between the heads being less than the length of the rolled article, and the heads must, therefore, be yieldingly urged into such position. This feature is provided because the length of the articles when rolled may vary slightly from a standard length to which the heads are normally set.

A rug 21 positioned in a non-central position within a tube 20 is shown in Figure 4a. The progressive operation of the centering heads is shown in Figures 4b, 4c, and 4d from which it will be noted that the rug is displaced with respect to the tube until it assumes a position centrally thereof as illustrated in Figure 4e, by coincidental yielding movement of the heads 24 toward each other.

In Figures 5 and 5a the crimping units 26 are diagrammatically shown in their extreme inward and outward positions of operation. The heads 27 are moved toward each other by yieldable driving means engaging the exposed edges of the tubes and turning them into a bead as illustrated in Figure 5a. It will be noted that the beads 28 engage the disks 22 which in turn engage the opposite ends of the rug 21.

While I have described and illustrated the preferred embodiment of my invention, it will be understood that the invention is not so limited but may be otherwise embodied within the scope of the following claims:

I claim:

1. In the method of packaging rolled articles which are substantially incompressible along a direction parallel to the axis of rolling and which have an axial length which may vary slightly from a standard axial length, the steps consisting in positioning a rolled article in a relatively rigid tube, positioning end disks within the tube and adjacent the ends of the article, and turning the ends of the tube inwardly into beads until the disks engage the ends of the article, regardless of its axial length.

2. In the method of packaging rolled articles substantially incompressible along a direction parallel to the axis of rolling and having an axial length which may vary slightly from a standard axial length, the steps consisting in positioning a pair of cushioning tubes about said article in abutting relationship; causing relative movement between said article and said tubes to position said article substantially centrally thereof, with portions of the tubes extending over the ends of the article; inserting reenforcing end disks into said tubes and yieldingly urging the exposed portions of said tubes inwardly and toward the center of said tubes into beads until said disks are clamped firmly in position between the ends of the article and the beads, regardless of the axial length of the article.

3. In the method of packaging rolled articles having an axial length which may vary slightly from a standard axial length, the steps consisting in rolling said article to a diameter smaller than the inner diameter of an enclosing tube, positioning said article within said tube, permitting said article to expand and engage the inner surface of the tube, positioning end disks in said tube for engagement with the ends of said article and turning the ends of said tubes into beads firmly clamping said disks at said beads and at the ends of said article, regardless of the axial length of the article.

4. In the method of packaging hard surfaced

floor coverings substantially incompressible along a direction parallel to the axis of rolling, the steps consisting in positioning a convolutely rolled hard surfaced floor covering within an enclosing tube, positioning an end disk adjacent one end of said article and applying pressure to the end of the tube to deform the same and urge the disk into engagement with the end of the article.

5. In the method of packaging rolled articles having a tendency to telescope upon rolling, the steps consisting in positioning a tube about said article, placing an end disk in engagement with the telescoped end of the article, yieldingly applying pressure to at least one end of the article in the tube to overcome said telescoping, and thereafter closing the tube.

6. In the method of packaging rolled articles having an axial length which may vary slightly from a standard axial length, the steps consisting in applying a pair of enclosing tubes to a rolled article, causing yielding relative movement between said tubes and said article to position said article substantially centrally of said tubes, positioning substantially flat end disks within the tubes adjacent the ends of the article and deforming a portion of each of the tubes to engage the disks and hold them against longitudinal movement and in contact with the ends of the article, regardless of its axial length.

7. In the method of packaging rolled articles substantially incompressible along a direction parallel to the axis of rolling and having an axial length which may vary slightly from a standard axial length, the steps consisting in positioning a rolled article in an enclosing tube, causing yielding relative movement between the article and the tube to cause the article to assume a position substantially centrally of said tube, positioning end disks within said tube and applying yielding pressure simultaneously to the ends of the tube to turn a portion thereof inwardly into beads and continuing the application of pressure until the inturned portions engage the disks and the disks engage the article, regardless of its axial length.

8. In the method of packaging hard surfaced floor coverings substantially incompressible along a direction parallel to the axis of rolling, the steps consisting in positioning a convolutely rolled hard surfaced floor covering within an enclosing tube, positioning end disks adjacent the ends of said article, applying pressure to the ends of the tube to deform the same and urge the cut edges of the tube into engagement with the disks and the disks into engagement with the article and continuing the application of pressure for an instant thereafter to form reenforcing grooves in the deformed portions of the tube intermediate the cut surfaces and the ends of the tube.

9. In the method of packaging a roll of hard surfaced floor covering material, or like rolled article, substantially incompressible along a direction parallel to its axis, in a relatively rigid, tubular housing, the steps consisting in positioning said roll within a relatively rigid, tubular housing, positioning end members within the housing and aplying rotative force simultaneously to both of the exposed ends of the housing to turn the ends thereof into inwardly and substantially axially extending flanges terminating in abutments for engagement with the end members.

10. In the method of packaging a roll of hard surfaced floor covering material or like rolled article, substantially incompressible along a direction parallel to its axis, in a relatively rigid, tubular housing, the steps consisting in positioning said roll substantially centrally of a housing formed of a pair of tube sections, positioning an end member within the housing adjacent an end of said roll and applying rotative force to the end of the tube section adjacent the said end of the roll and continuing the application of such force until an inwardly turned, substantially axially extending flange is formed for engagement with the end member.

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