

Feb. 19, 1952

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2,586,078

METHOD AND MEANS FOR PACKAGING

Filed June 19, 1946

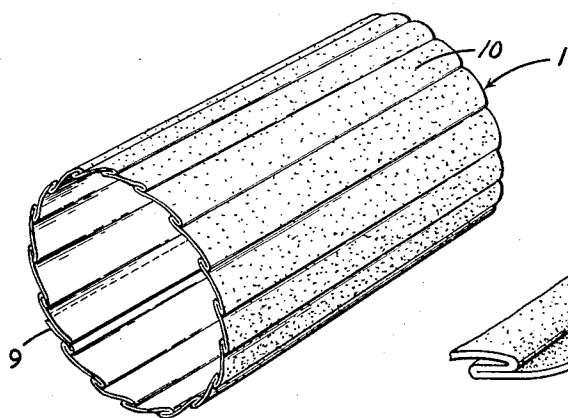


Fig. 1

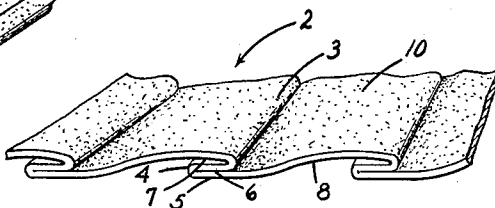


Fig. 2

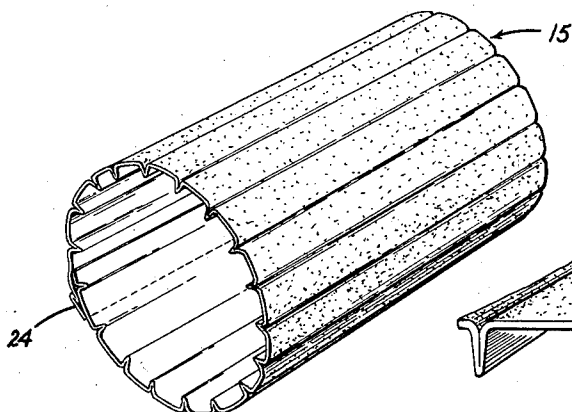


Fig. 3

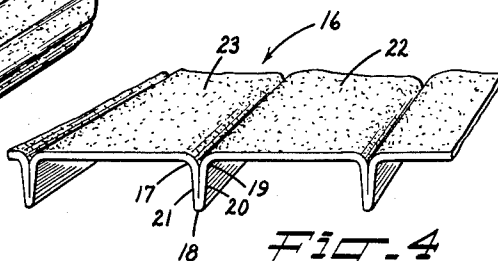


Fig. 4

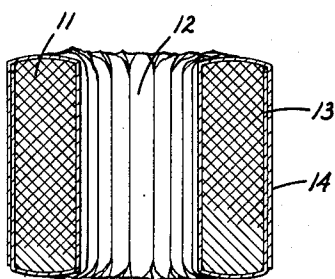


Fig. 5

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2,586,078

METHOD AND MEANS FOR PACKAGING

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Application June 19, 1946, Serial No. 677,761

2 Claims. (Cl. 229—87)

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This invention relates to methods and means for packaging, more particularly to methods and means for packaging yarn, thread, and the like filamentary material wound in the form of a hollow body or cake.

Before subjecting wound yarn or thread packages to liquid treatment, it is the customary practice to wrap the body of yarn or thread in a liquid permeable covering means to prevent the yarn or thread from becoming tangled or being otherwise damaged. Various forms of covering means for this purpose have been suggested, but it has been found that it was difficult to retain the covering means in position in close contact with the yarn or thread. Very often during the liquid treatment the covering means became disarranged causing damage to the yarn or thread, and often the covering means itself was damaged.

Applicant has invented methods and means for packaging that overcome the foregoing objections and that have added advantages in that they are applicable to covering means that are inexpensive and may be used as a packaging means in which the yarn or thread is shipped.

The invention has for its principal object to provide economical methods and means for packaging yarn and thread or other filamentary material wound in the form of a hollow body such as a cake, that protects the yarn or thread during liquid treatment from disarrangement that would make winding difficult or other damage and in which the liquid treated yarn or thread may be dried and shipped.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawing.

In the drawing,

Figure 1 is a perspective view of a tubular member of pleated permeable sheet material forming a part of applicant's invention.

Figure 2 is an enlarged fragmentary view showing the arrangement of the pleated portions of the sheet material forming the tubular member shown in Figure 1.

Figure 3 is a perspective view of a tubular member of pleated permeable sheet material forming a part of another embodiment of applicant's invention.

Figure 4 is an enlarged fragmentary view showing the arrangement of the pleated portions of the sheet material forming the tubular member shown in Figure 3.

Figure 5 is a sectional view of a yarn or thread package embodying applicant's invention.

While applicant's invention is applicable to

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packaging yarn, thread and the like filamentary material that is wound in the form of a hollow body or cake, it is particularly applicable where the filamentary material is to be subjected to liquid treatment while in package form.

When the filamentary material is packaged in accordance with the present invention, the covering member closely fits the filamentary material and is retained in position throughout a series of liquid treating and drying steps. The arrangement of the covering means is such that it readily withstands handling and manipulation of the package during the liquid treating and drying steps and during shipment of the package.

In accordance with the practice of the present invention, water permeable sheet material of paper or the like having sufficient wet strength is pleated by folding spaced portions of the sheet material along parallel lines. The pleated sheet material is then formed into a tube by overlapping portions of the sheet material along the sides and with the pleated portions extending longitudinally of the tube. The pleated tube is inserted into the body of filamentary material with the mid-portion of the tube in contact with the inner wall of the body of the filamentary material. The ends of the tube are then brought over the ends of the body of the filamentary material and positioned in overlapping relation against the outer wall of the body of filamentary material forming a package in which the body of filamentary material is completely enclosed. In this package, the covering means firmly engages both the inside and the outside of the body of filamentary material.

Referring to Figures 1 and 2 of the drawing in which an embodiment of the invention is shown, reference character 1 indicates generally a pleated covering member in tubular form that is made from the pleated sheet of material indicated generally by reference character 2. The sheet material is of water permeable paper or the like having substantial wet strength. The sheet material is pleated by folding spaced portions of the material on itself, first in one direction and then in the other along the parallel lines 3 and 4 to form the parallel overlapping portions 5, 6, and 7 spaced apart by the single thickness of sheet material 8. The folded portions may be pressed with a heated iron or roller while damp to retain the folded portions in position and to resist distortion. In order to retain the folded portions more securely in position, a further procedure is employed. In this case one

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surface of the sheet material, before folding, is lightly sprayed with a wax or resin solution or is lightly dusted with a wax or resin powder or flock of resin filaments. The wax or resin is potentially adhesive and is made adhesive by the application of heat. The application of the resin or wax is sufficiently light and dispersed so that the particles 10 of potentially adhesive material applied to a surface of the sheet material are relatively widely spaced apart and the liquid permeability of the sheet material is not appreciably impaired. After the sheet material has been folded as described above, the folds are pressed down with a heated iron or roller that energizes the potentially adhesive material and lightly secures together the overlapping portions of the folds to which the adhesive has been applied. The sides of the sheet material are brought together in overlapping relation to form a tubular member with the parallel pleated portions extending longitudinally and with the overlapping portions 5 and 6 positioned on the inside of the tube. The sheet material may be held in tubular form by adhesively or otherwise securing together the overlapped edges 9 or the tube may be held together by merely allowing sufficient overlap. The diameter of the tube is that of the inside of the body of filamentary material to be packaged. The adhesive bonds between the overlapping portions forming the pleats are such that they may be readily broken and the pleats opened without tearing or damaging the sheet material where it is desired to enlarge the tube.

The tubular member of pleated sheet material is preferably applied to the filamentary material to be packaged as shown in Figure 5 of the drawing. The tubular member is passed through the inside of the body of filamentary material 11 with the mid-portion 12 of the tubular member positioned in engagement with the inner wall of the body of filamentary material. One end portion 13 of the tube, enlarged a sufficient amount is drawn over one end of the body of filamentary material and is positioned in contact with the outer wall of the body of filamentary material substantially throughout its length. The other end portion 14 of the tube, enlarged a sufficient amount is drawn over the other end of the body of filamentary material and positioned in overlapping relation with the end portion of the tubular member in contact with the outer wall of the body of filamentary material substantially throughout its length. With this arrangement the tubular member closely fits the inner wall of the filamentary body with the folded portions forming the pleats extending longitudinally through the filamentary body to reinforce the covering means and retain the covering means in position. In drawing the end portions of the tubular member over the ends of the body of filamentary material and in positioning them in overlapping relation against the outer wall of filamentary material, the pleats are opened a sufficient amount by rupturing the adhesive bonds between the overlapping portions. The pleats are of sufficient depth and number that they may be opened to enlarge portions of the tubular member sufficiently to enable them to be drawn over the ends of the body of filamentary material and positioned in overlapping relation against the outer wall of the body in filamentary material without completely opening the pleats so that a portion of each of the pleats is present in the overlapped portions of the tubular member positioned on the outside of the body of

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filamentary material that is packaged. As the folds comprising the pleated portions are in overlapping relation, the pleats may be positioned against the outer wall of the body of filamentary material by rubbing or smoothing them against the body of filamentary material in the direction they extend.

Referring to Figures 3 and 4 of the drawing in which another embodiment of the invention is shown, reference character 15 indicates generally a pleated covering member in tubular form that is made from the pleated sheet of material indicated generally by reference character 16. The sheet material is of water permeable paper or the like having substantial wet strength. The sheet material is pleated by folding spaced portions of the material on itself first in one direction and then in the other, along the parallel lines 17, 18, and 19 to form the parallel overlapping portions 20 and 21 spaced apart by the single thickness of sheet material 22. The folded portions may be pressed with a heated iron or other means while damp to retain the folded portions in position and to resist distortion. The portions of the sheet material forming the pleats extend substantially at right angles to the adjacent portions 22 of the sheet material. In order to retain the folded portions of the sheet material more securely in position, a further procedure may be employed. In this case one surface of the sheet material, before folding, is lightly sprayed with a wax or resin solution or is lightly dusted with a wax or resin powder or flock of resin filaments. The wax or resin is potentially adhesive and is made adhesive by the application of heat. The application of the resin or wax is sufficiently light and disbursed so that the particles 23 of potentially adhesive material applied to a surface of the sheet material are relatively widely spaced apart and the liquid permeability of the sheet material is not appreciably impaired. After the sheet material has been folded as described above, the folds are pressed together with a heated iron or other means that energizes the potentially adhesive material and lightly secures together the overlapped portions of the folds to which the adhesive has been applied.

The sides of the sheet material are brought together in overlapping relation to form a tubular member with the parallel pleated portions extending longitudinally and with the overlapping portions 20 and 21 extending substantially radially into the tube. The sheet material may be held in tubular form by adhesively or otherwise securing together the overlapping edges 24 or the tube may be held together by merely allowing sufficient overlap. The diameter of the tube is that of the inside of the body of filamentary material to be packaged. The adhesive bonds between the overlapping portions forming the pleats are such that they may be readily broken and the pleats opened without tearing or damaging the sheet material where it is desired to enlarge the tube.

The tubular member of sheet material as shown in Figures 3 and 4 of the drawing and described above is preferably applied to the body of filamentary material to be packaged in the same manner as the embodiment shown in Figures 1 and 2 of the drawing, that is; in the manner shown in Figure 5 of the drawing.

The tubular member of pleated sheet material is preferably applied to the filamentary material to be packaged as shown in the drawing. The tubular member is passed through the inside of

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the body of filamentary material with the mid-portion of the tubular member positioned in engagement with the inner wall of the body of filamentary material. One end portion of the tube, enlarged a sufficient amount, is drawn over one end of the body of filamentary material and is positioned in contact with the outer wall of the body of filamentary material substantially throughout its length. The other end portion of the tube, enlarged a sufficient amount, is drawn over the other end of the body of filamentary material and positioned in overlapping relation with the end portion of the tubular member in contact with the outer wall of the body of filamentary material substantially throughout its length. With this arrangement the tubular member closely fits the inner wall of the filamentary body with the folded portions forming the pleats extending longitudinally through the filamentary body to reinforce the covering means and retain the covering means in position. In drawing the end portions of the tubular member over the ends of the body of filamentary material and in positioning them in overlapping relation against the outer wall of filamentary material, the pleats are opened a sufficient amount by rupturing the adhesive bonds between the overlapping portions. The pleats are of sufficient depth and number that they may be opened to enlarge portions of the tubular member sufficiently to enable them to be drawn over the ends of the body of filamentary material and positioned in overlapping relation against the outer wall of the body of filamentary material without completely opening the pleats so that a portion of each of the pleats is present in the overlapped portions of the tubular member positioned on the outside of the body of filamentary material that is packaged.

It is seen that in the packaging means made in accordance with the present invention the overlapping portions forming the pleats are on the inside of the portion of the covering means positioned against the inner wall of the body of the filamentary material and serve to stiffen and reinforce this portion and hold it against the filamentary material. The folded portions also tend to serve as a means for guiding the package when it is placed on a supporting rod and also resist abrasion of the body of the covering means by the supporting rod.

While preferred embodiments of the invention have been shown and described, it is to be understood that the description herein above is illustrative only, and that changes and variations may be made without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. Packaging means comprising an integral unitary water permeable, paper-like sheet ma-

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terial in cylindrical tubular form having overlapping folded portions of the sheet material extending longitudinally and spaced apart circumferentially by unfolded portions of the sheet material and with the overlapping portions secured together by a potentially adhesive material so dispersed that the water permeability of the sheet material is not appreciably diminished and the secured portions of the sheet material may be separated without materially damaging the sheet material.

2. A method of packaging a hollow body of filamentary material comprising positioning within the filamentary body an integral unitary water permeable, paper-like sheet material in tubular form having therein overlapping folded portions of the sheet material extending longitudinally and spaced apart circumferentially by unfolded portions of the sheet material, with the overlapping portions of the sheet material secured together by a potentially adhesive material so dispersed that the permeability of the sheet material is not appreciably diminished and the secured portions of the sheet material may be separated without materially damaging the sheet material, with the mid-portion of the tubular member in engagement with the inner wall of the filamentary body, separating the folded portions in the end portions of the tubular sheet, drawing one end portion of the tubular sheet material over the end of the filamentary body and positioning the end portion against the outer wall of the filamentary body substantially throughout its length, drawing the other end portion of the tubular sheet material over the other end of the filamentary body and positioning the other end portion of tubular sheet material in overlapping relation with the first end portion of the tubular sheet material against the outer wall of the filamentary body substantially throughout its length.

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