June 30, 1936. W. B. TUCKER 2,046,138

CORK COT AND METHOD OF MAKING THE SAME

Filed Oct. 30, 1934

Fig. 1

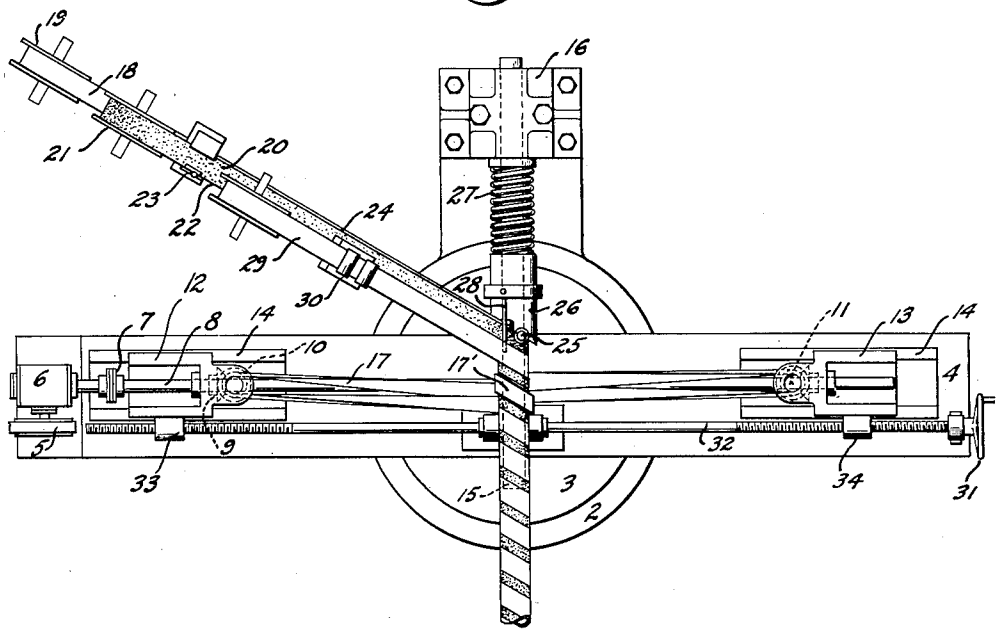


Fig. 2

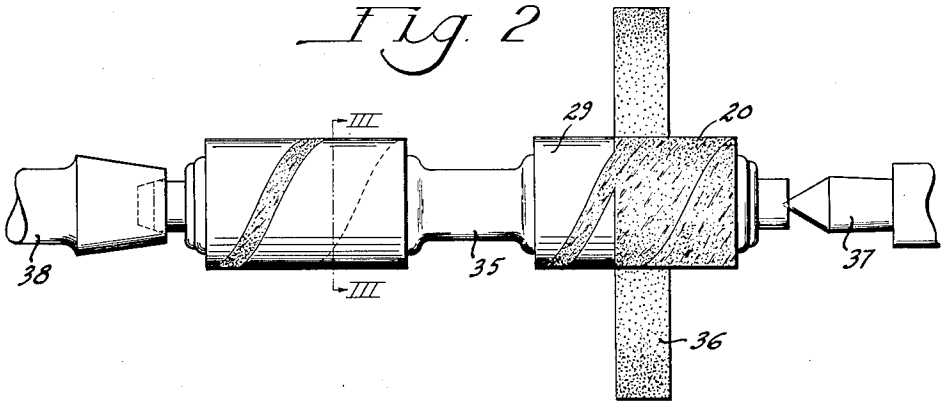
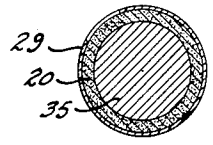


Fig. 3



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Patented June 30, 1936 2,046,138

UNITED STATES PATENT OFFICE

2,046,138

CORK COT AND METHOD OF MAKING THE SAME

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Application October 30, 1934, Serial No. 750,704

16 Claims. (Cl. 93—94)

My invention relates generally to cork cots and method of making the same and more particularly to a cork cot formed of a helically disposed ribbon of cork composition held as a helix by an interposed adhesive at the joints and by a strip of sheet material disposed over the joints and secured to the cork ribbon, said strip preferably being of a readily abradable character and secured by an adhesive which sets relatively more quickly than the adhesive applied to the joints of the cork ribbon. By such a construction, the joining strip may be conveniently removed from the cot by the usual grinding operation performed in truing up the cot after application to a roll. My method contemplates winding a ribbon of cork composition having adhesive applied to at least one longitudinal edge helically in a cylindrical shape and adhesively securing a ribbon of reenforcing sheet material over the joint formed by the abutting edges of the composition ribbon. My invention further relates to a method of making cork cots by feeding a ribbon of cork to a mandrel and urging the ribbon forwardly and about the axis of said mandrel to form a tube of indefinite length, which tube may be then severed into desired lengths convenient for handling.

Cork cots produced from a helically disposed ribbon of cork composition held as a helix solely by an adhesive at the joints have been heretofore manufactured, but the process employed has been relatively slow and expensive, and the cots so produced while very satisfactory for most uses do not possess the strength of cots having a reenforcing layer secured over the joints, which additional strength is particularly desirable when the cots are applied to greatly oversized rolls. In the copending application of Charles W. St. Claire, Serial No. 611,983, filed May 18, 1932, a method of making such cots is shown and described, wherein a cork composition ribbon is wound helically about a revolving mandrel, the end of the ribbon having been first secured to the mandrel, adhesive is applied to the abutting edges of the ribbon and the edges are urged into firm engagement. When the mandrel has been covered, the leading end of the ribbon is secured and the adhesive permitted to set prior to removal of the tube from the mandrel. Many mandrels are required because the adhesive employed is relatively slow setting and the mandrels are, therefore, idle for a long period of time while the adhesive sets.

It has heretofore been impossible to produce cots of this type by a continuous process because certain characteristics of the materials employed in the manufacture of such cots militated against continuous operation. First, a relatively slow setting adhesive has been found desirable for securement of the abutting edges of the cork composition ribbon to hold the same firmly and prevent opening at the joints upon application to the rolls, and secondly, the highly frictional character of the cork composition prevents its being moved about a mandrel or other forming surface.

In the manufacture of cots by a continuous process employing a machine of the tube making type, I have found that when winding a cork composition strip about the mandrel, the cork ribbon which is inherently resilient tends to return to its original shape whereby the joint opens, by reason of the adhesive not having set sufficiently to hold the edges against the natural spring of the cork, thereby forming an undesirable construction. Furthermore, in the operation of tube machines, the material is urged in a helical manner about a stationary mandrel and the frictional quality of the cork composition prevents such turning, since the cork composition firmly grips the mandrel.

Among the objects of my invention is the production of a single thickness, helically formed cork composition cot which is provided with a reenforced joint to permit handling and application to rolls, preferably, the reenforcing being in the form of a strip of readily abradable material. It is a further object of my invention to provide a method for economically manufacturing such cots whereby equipment is not unnecessarily idle while the adhesive sets. Another object of my invention is to provide a process whereby cork cots may be made as tubes of indefinite length and subsequently cut to the desired final size.

According to my preferred procedure, a strip of material having a non-frictional surface is fed to a stationary mandrel with said surface in engagement therewith. This base strip serves to permit movement of a ribbon of cork composition which is next applied to the mandrel over the previously applied base strip. Adhesive is applied to at least one longitudinal edge of the cork ribbon, and the base strip and the cork ribbon are urged forwardly and about the axis of the mandrel; the movement describing a helix thereabout. The edges of the cork composition ribbon are urged into firm engagement and a securing strip of substantially inextensible material having a relatively quick setting adhesive applied

thereto is placed over the abutting joint formed by wrapping the ribbon about the mandrel. This securing strip, which is firmly bonded to the faces of the cork composition ribbon which is now disposed as a helix and with the edges in firm engagement, securely holds the ribbon as a tube and prevents opening of the seams. The adhesive applied to the securing strip should be such that it holds the joints in position substantially immediately upon application to the cork. It does not necessarily have to take a permanent set so long as it holds the joints in their proper position until the adhesive applied to the cork at the joints has set. The adhesive may be such that the reenforcing strip may be peeled off instead of abraded away. The helical movement of the ribbon of cork and the base and securing strips about the mandrel is continued, thus forming a tube of indefinite length having an inner ply of non-frictional strip material, an intermediate cylinder of cork composition disposed as a helix and an outer strip of sheet material secured over at least the joints of the cork ribbon.

In order that my invention may be more readily understood, I will describe the same in conjunction with the attached drawing, in which

Figure 1 is a top plan view of an apparatus suitable for carrying out my process;

Figure 2 is a diagrammatic view illustrating my cork cot applied to a textile roll, showing the abrading of the reenforcing strip; and

Figure 3 is a sectional view taken on the line III—III of Figure 2.

Cork cots are employed particularly in the textile spinning industry and while my invention will be specifically described in connection with such cots as a preferred embodiment, it will be understood that such cots are suitable for various other uses.

The mechanism used for carrying out the process of my invention is more fully described and illustrated in the copending application of Fred Vottler, Serial No. 750,705, filed October 30, 1934, and comprises a base 2 upon which is rotatably mounted a table 3 to which a belt tensioning and driving mechanism generally indicated by the numeral 4 is secured.

The driving mechanism includes a pulley 5 driven from a suitable source of power (not shown). The pulley 5, through a reduction gear 6, a flexible coupling 7, a shaft 8, and gearing 9 drives belt wheels 10 and 11 mounted in supports 12 and 13 respectively, which supports are slidably mounted on a base plate 14 for adjustment as will be more fully hereinafter described. A mandrel 15 about which the tubes are formed and which will vary in diameter with the inner diameter of the finished cot is removably secured in fixed position in a head 16. A driving belt 17 encircles the wheels 10 and 11 and is wrapped about the mandrel 15 in a helix 17'.

In carrying out my preferred procedure for the manufacture of cork cots, a base strip of material 18 having at least one face of non-frictional character is fed from a source of supply such as the roll 19. This base strip is wrapped about the mandrel 15 with the surface in engagement with the mandrel being of non-frictional character in order to permit movement of the strip thereabout. A suitable non-frictional material for this purpose is oiled kraft paper, although any suitable non-frictional material may be used. This sheet is preferably of a width sufficient to cover the entire surface of the mandrel when disposed as a helix thereabout at substantially the same angle of feed as the cork in order to prevent contact of a cork composition ribbon 20 which is fed from a roll 21 over the strip 18.

Adhesive is applied to a longitudinal edge 22 of the cork ribbon 20 by a feeding mechanism 23. If desired, adhesive may be applied to the other longitudinal edge 24 by means of a similar feeder 25 mounted on a guide collar 26, which collar urges the abutting edges of the cork ribbon into firm engagement as the ribbon is fed about the mandrel. The collar 26 is urged into engagement with the longitudinal edge 24 of the cork ribbon 20 by a spring 27. The size of the spring determines the amount of pressure applied. The edge 22 of the ribbon 20 is urged downwardly and into contact with the previously applied portion by a bar 28 acting upon the longitudinal edge.

The adhesive which I prefer to use has a polybasic acid-polyhydric alcohol base and does not set instantly upon application. This type of adhesive is suited to the temperature and humidity conditions encountered in textile mills, but when first applied, the cork composition ribbon has a tendency to open at the joints, particularly when wrapped to a small diameter, and I prefer to secure a strip 29 over the joint in the tube, said strip being preferably adhesively secured to the cork ribbon by a quick setting adhesive. Other adhesives such as manila gum, plasticized gelatin, and the like may be used to secure the edges of the cork composition ribbon. The adhesive used should not become too hard upon setting, but should be relatively flexible and preferably partake of the characteristics of the adhesive employed as the binder for the cork composition in order to avoid lines of unyielding adhesive at the joints. I have found that the gummed kraft tape of commerce, which comprises a kraft sheet with a water soluble adhesive applied thereto, is admirably suited for the purpose of holding the cork composition in place, since it may readily be rendered adhesive by moistening and because its adhesive properties are immediately available upon contact with the ribbon. A moistening device is shown at 30. The strip 29 may be as wide or wider than the ribbon 20 and overlapped, but I prefer to have it slightly narrower. The desired end is to provide a strip having sufficient contact over the joints to hold the joints in firm engagement until the adhesive has set. Care should, of course, be exercised to insure that the gummed strip is applied only after the joints have been urged into firm engagement and before the tension is released from the cork.

As shown in Figure 1, the base strip 18, the ribbon 20 and the securing strip 29 are fed forwardly and about the axis of the mandrel 15 by the driving belt 17. The helix 17' formed by the belt should be so determined that it tends to urge the abutting edges of the cork ribbon into engagement rather than tending to open the joints as would be the case if the lead of the helix were not properly determined with respect to the lead of the helix of the cork ribbon. The lead of the helix 17' may be varied by movement of the table 3 on the base 2 with respect to the mandrel 15 and the tension applied to the belt 17 may be varied by operation of the hand wheel 31 operating the shaft 32 which in turn engages oppositely threaded brackets 33 and 34 on the supports 12 and 13 respectively whereby the distance between the wheels 10 and 11 may be readily changed to suit the desired needs.

It will be seen from an examination of Figure 1 that continued rotation of the strips about the

mandrel 15 produces a tube of an indefinite length, since the sheets are fed continuously to the mandrel from their respective rolls by the forward movement of the previously applied portions of such strips; movement of the strips forwardly and about the axis of the mandrel continuously moving a completed portion of the tube from the mandrel. I prefer to cut the tubes in lengths convenient for handling, say 6 to 8 feet long and stack these tubes in a convenient bin for drying or setting of the adhesive applied to the joints. After the adhesive has completely set the tubes thus formed may be cut into the desired length cots.

As shown in Figure 2, the cot may be applied to a textile roll 35 after removal of the inner paper layer 18 from the tube, which, since no adhesive is applied to this layer, is easily pulled therefrom. I prefer to permit the paper reenforcing strip 29 to remain on the cot until assembled on the desired roll. Cork cots are commonly secured to rolls by means of an adhesive and it is desirable that the inner diameter of the cot be slightly less than the outer diameter of the roll to which it is applied. The paper reenforcing strip serves to prevent the joint formed by abutting edges of the ribbon from opening up when the cot is forced onto an oversized roll. Furthermore, the paper covering serves to some extent to prevent damage to the surface of the work ribbon 20, forming the finished cot surface, during handling and application of the cots to the rolls.

It is common practice, particularly in the textile industry, to grind the surface of the cork cot after application to the roll in order to form a smooth, true cork surface concentric with the axis of rotation of the roll. As shown in Figure 2, a rotating grinding wheel 36 is brought into engagement with a cot mounted on the roll 35 which is secured in suitable supports 37 and 38, the support 38 being preferably driven to rotate the roll and cot. The strip 29 is readily removed by this grinding operation and a true, cylindrical cork composition surface is obtained on the cot.

While I have disclosed gummed kraft tape as the preferred material for application to the joints in the cork ribbon, it will be understood that other materials may be employed provided they are removable by grinding or otherwise so as to present in the finished product a cork composition working surface. A strip of cellulose hydrate may be employed, for example, or a layer of thin metal foil may be used provided the adhesive permits its removal and serves to hold the joints in firm engagement until the adhesive applied at the joints has set. It will be apparent that the sheet material should be relatively inexpensive since it is subsequently removed.

I have described my preferred method in connection with the manufacture of cots on a tube winding machine. It will be understood, however, that my invention may be employed in the usual revolving mandrel type machines and considerable savings will be affected because by my method the tubes may be removed from the mandrel immediately upon forming and the mandrel reused for the manufacture of additional tubes. A centerless winding machine may be utilized if care is exercised in forming a tight joint in the cork composition tube.

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 making cork composition cots, the steps consisting in winding a strip of cork composition having adhesive applied to at least one longitudinal edge thereof helically into a cylindrical shape with the abutting edges in firm engagement, and adhesively attaching a securing strip of substantially inextensible sheet material over the joint formed by the abutting edges of the cork strip to hold said cork composition strip as a cylindrical shape until the adhesive applied to the longitudinal edge of the cork composition strip has set.

2. In the method of making cork composition cots, the steps consisting in winding a strip of cork composition having adhesive applied to a longitudinal edge thereof helically into a cylindrical shape with the abutting edges in firm engagement, said cork composition strip and said adhesive being of such character that the joint formed by the abutting edges will normally tend to open when the adhesive is first applied, and adhesively attaching a readily removable securing strip of sheet material over the joint formed by the abutting edges of the cork composition strip.

3. In the method of making cork composition cots, the steps consisting in winding a strip of cork composition having a relatively slow setting adhesive applied to at least one longitudinal edge thereof helically into a cylindrical shape about a mandrel with the abutting edges in firm engagement, securing a strip of readily abradable material over the joint formed by the abutting edges of the cork strip by means of a quick setting adhesive, and removing the cylindrical shape so formed from the mandrel before the adhesive at the abutting edges of the cork composition strip has set.

4. In the method of making cork composition cots, the steps consisting in winding a strip of material having a substantially non-frictional surface about a mandrel with the non-frictional surface in engagement therewith, disposing a strip of cork composition having adhesive applied to a longitudinal edge thereof helically about said strip of material on said mandrel, urging the abutting edges of said cork composition strip into firm engagement and thereafter securing a strip of substantially inextensible sheet material over the joint formed by the abutting edges of the cork composition strip.

5. In the method of making cork cots, the steps consisting in winding a layer of paper having an unctuous surface helically about a mandrel with its longitudinal edges in close proximity, helically disposing a cork composition ribbon over said paper layer while urging the longitudinal edges of said ribbon into abutting relationship to form a hollow cylinder of cork composition, said ribbon being held as a helix by means of an interposed adhesive on the longitudinal edges thereof, securing a ribbon of thin, readily abradable, sheet material over the joint formed by the abutting edges of the cork ribbon by means of a quick setting adhesive, said ribbon of sheet material being of a width less than the width of the cork ribbon and being disposed over the cork ribbon and with their respective longitudinal edges substantially parallel.

6. In the method of making single thickness cork composition cots, the steps consisting in progressively feeding a ribbon of composition cork

having adhesive applied to a longitudinal edge thereof to a stationary mandrel, and urging the longitudinal edges of said ribbon into firm abutting engagement and said ribbon forwardly and about the axis of the mandrel to form a cylinder of helically disposed cork ribbon.

7. In the method of making cork composition cots, the steps consisting in progressively feeding a strip of sheet material having a non-frictional surface to a stationary mandrel with the non-frictional face in engagement therewith, progressively feeding a ribbon of cork composition having adhesive applied to a longitudinal edge thereof to said mandrel over said sheet material, urging the longitudinal edges of said ribbon into firm abutting engagement, moving said ribbon and said strip forwardly and about the axis of said mandrel, and removing the hollow cylinder so formed from the mandrel by continued feeding and forward movement of said ribbon and said strip.

8. In the method of making cork composition cots, the steps consisting in progressively advancing a strip of sheet material having a non-frictional face about a stationary mandrel with the non-frictional face in engagement therewith, progressively advancing a ribbon of composition cork having a relatively slow setting adhesive applied to a longitudinal edge thereof about said mandrel with said strip of sheet material, urging the longitudinal edges of said ribbon in firm abutting engagement to form a cylinder of helically disposed cork composition ribbon, adhesively securing a ribbon of readily abradable sheet material over the abutting joints so formed and removing the hollow cylinder so formed from the mandrel by urging the material on the mandrel forwardly and about the axis thereof.

9. In the method of making cork composition cots, the steps consisting in progressively feeding a ribbon of composition cork having a relatively slow setting adhesive applied to a longitudinal edge thereof to a stationary mandrel, urging the longitudinal edges of said ribbon into firm abutting engagement to form a cylinder of helically disposed cork composition ribbon, securing a ribbon of readily abradable material over the abutting joints so formed by means of an adhesive which sets up more rapidly than the adhesive applied to the longitudinal edges of said cork composition ribbon and urging said ribbon forwardly and about the axis of said mandrel to remove said cork composition ribbon from said mandrel as a hollow cylinder of indefinite length.

10. In the method of making single thickness cork composition cots, the steps consisting in applying an adhesive to a longitudinal edge of a strip of cork composition and feeding said strip to a stationary mandrel while urging the same in a path describing a helix thereabout thereby urging the longitudinal edges into firm engagement and forming the strip into a hollow cylinder having a helically disposed joint.

11. In the method of making cork composition cots, the steps consisting in winding a strip of cork composition having adhesive applied to a longitudinal edge thereof helically into a cylindrical shape about a forming surface with the abutting edges in firm engagement, said cork composition strip and said adhesive being of such character that the joint formed by the abutting edges will normally tend to open when the adhesive is first applied, adhesively attaching a readily removable securing strip of sheet material over the joint formed by the abutting edges of the cork composition strip, removing the shape so formed from the forming surface prior to setting of the adhesive at the joint, permitting the adhesive to set and thereafter removing the securing strip.

12. As a new article of manufacture, a cork composition cot comprising a cylindrical body formed of a cork composition strip helically disposed, the abutting edges of the strip being adhesively united and in firm engagement, and a ribbon of material adhesively secured over the joints formed in the cylindrical cork composition body, said ribbbon being relatively thin and readily abradable to permit removal by grinding.

13. As a new article of manufacture, a cork composition cot comprising a cylindrical body formed of a cork composition strip helically disposed, the abutting edges of the strip being adhesively united with a flexible adhesive and in firm engagement, and a ribbon of substantially inextensible sheet material of a width less than the width of the cork composition ribbon adhesively secured to the body over the helical joint and covering a portion only of the outer surface of the body.

14. As a new article of manufacture, a cork composition cot formed of a helically disposed cork composition ribbon adhesively secured as a helix by an adhesive at the helical joint and a sheet of paper adhesively secured to said cork composition over said joint, said paper strip engaging a portion of the surface of said ribbon sufficient to prevent opening up of the helical joint upon application of the cot to a roll and being relatively thin and readily abradable to permit removal by grinding.

15. As a new article of manufacture, a cork composition cot formed of a helically disposed cork composition strip adhesively secured as a helix by a flexible adhesive disposed at the helical joint thereof, and a strip of substantially inextensible sheet material disposed over said joint and removably secured to the face of said cork composition ribbon.

16. In the method of making cork composition cots, the steps consisting in forming a strip of cork composition into a cylindrical shape with the joint formed by the abutting longitudinal edges of the strip disposed as a helix and secured by means of an adhesive disposed at the joint securing a strip of substantially inextensible sheet material to the face of the cork composition strip over the helical joint by means of an adhesive which permits stripping of the strip of sheet material from said cork composition shape, and stripping said strip from said cork composition shape after the adhesive at the helical joint has set.

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