

April 7, 1925.

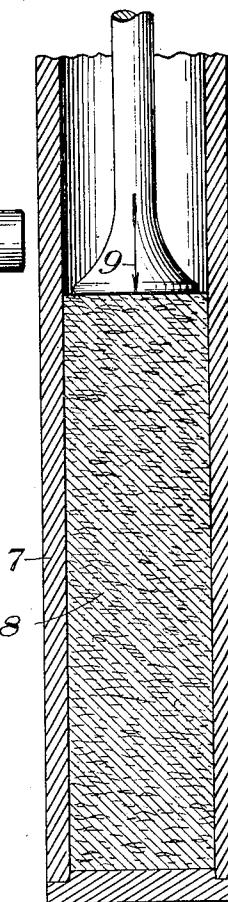
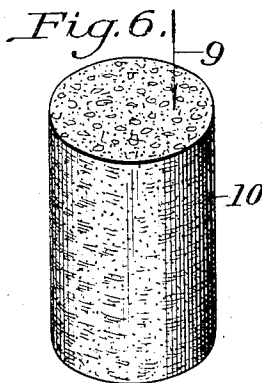
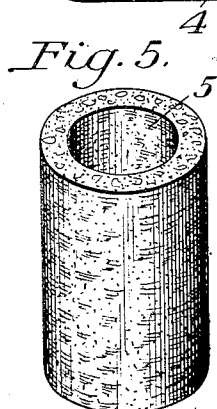
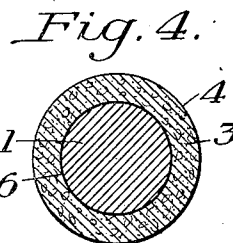
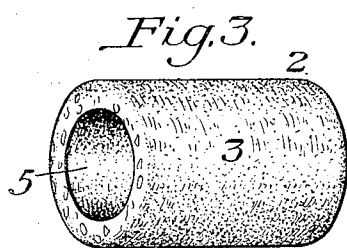
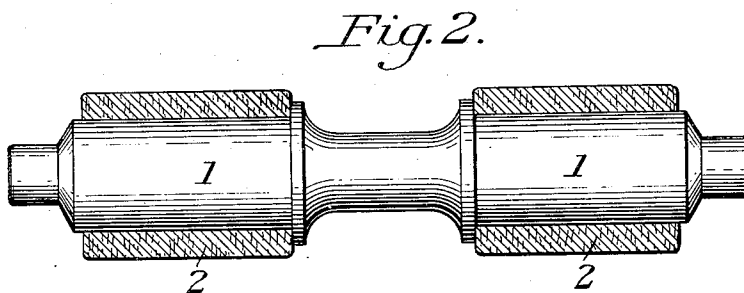
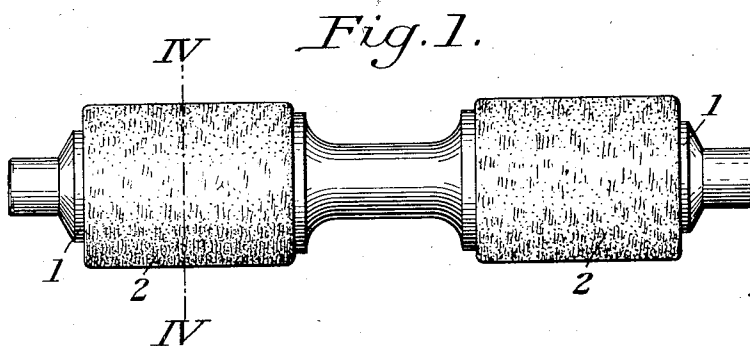
1,532,682

H. F. BUSCH

TEXTILE ROLL AND METHOD OF MAKING THE SAME

Filed April 14, 1924

2 Sheets-Sheet 1



INVENTOR

Herman F. Busch
by his attorney
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2 Sheets-Sheet 2

Fig. 10.

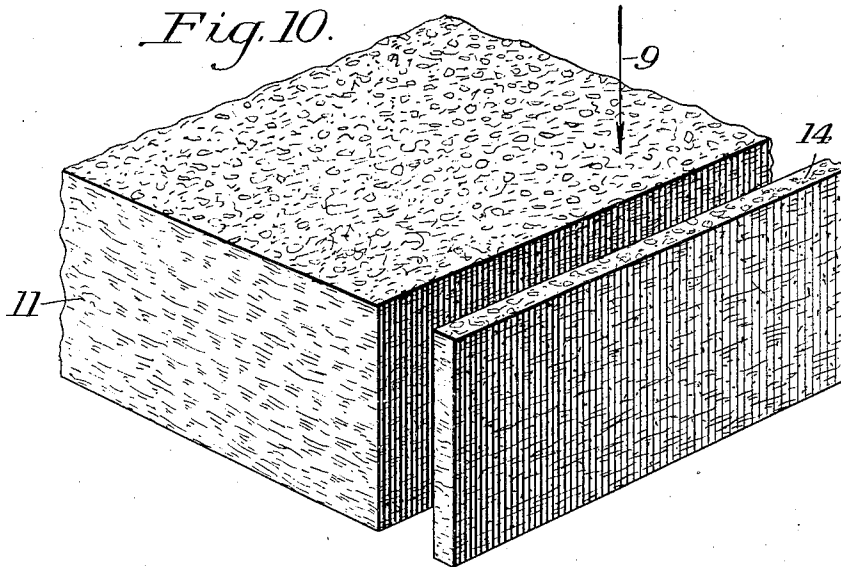


Fig. 9.

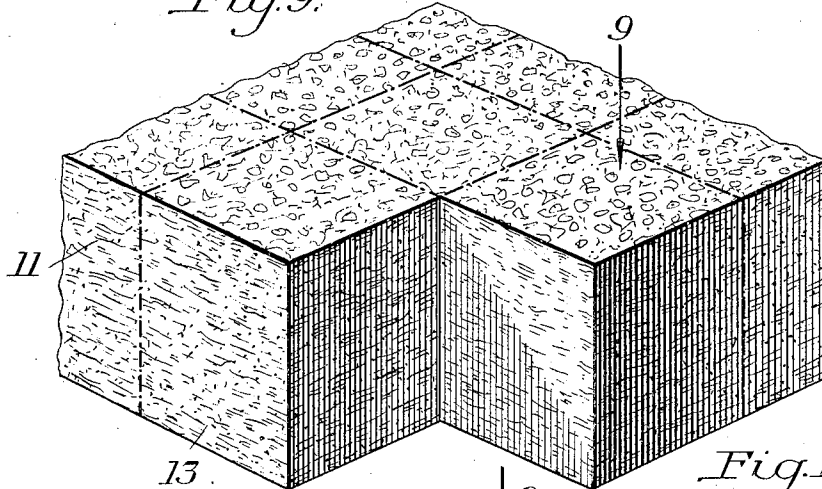
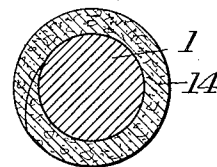
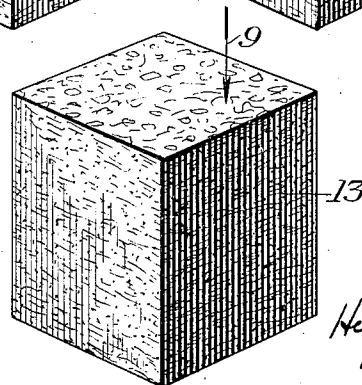


Fig. 11.

Fig. 8.



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Patented Apr. 7, 1925.

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UNITED STATES PATENT OFFICE.

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TEXTILE ROLL AND METHOD OF MAKING THE SAME.

Continuation of application Serial No. 636,139, filed May 2, 1923. This application filed April 14, 1924.
Serial No. 706,353.

To all whom it may concern:

Be it known that I, HERMAN F. BUSCH, a citizen of the United States, residing at Millvale, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Textile Rolls and Methods of Making the Same, of which the following is a full, clear, and exact description.

This application is a continuation of my copending application Serial No. 636,139, filed May 2, 1923.

The present invention relates to textile rolls and method of making the same, and more especially to textile rolls having working surfaces of compressed artificial cork. The invention is illustrated as applied to the drawing rolls used on a spinning frame, but it will be understood that it may be applied to other rolls employed in the textile industry.

The drawing rolls on a spinning frame are disposed in pairs, the lower roll being usually a steel roll and the upper roll in contact with it being a roll with a friction sleeve or facing. These rolls are commonly known as the top rolls. Heretofore the top drawing rolls have been usually covered with sleeves or cots made of leather with a felt backing or lining to increase the resiliency of the cot. These leather cots are expensive. When the rolls are to be re-covered, they have to be taken out of the spinning frame and sent to the establishment which applies the leather cots or covers. This not only necessitates the removal and shipment of the rolls to be re-covered, but also requires a considerable number of extra rolls to be kept in stock to be used while the rolls are being re-covered.

Various suggestions have been made to substitute other material for the leather felt-backed cots, but such substitute materials have in practice met with little or no success and the leather covered cots are now almost universally employed in the textile industry for this type of roll.

In accordance with the present invention, the rolls are provided with working surfaces of compressed artificial cork, the direction of compression of the cork being such that the flattened granules of which it is composed are disposed edgewise to the working surface of the roll. The roll cover-

ings are preferably supplied in the form of already finished cots which may be readily slipped over the metal bodies of the rolls so as to permit quick replacement and obviate shipping them away for re-covering.

The finished cots ready to be immediately applied to the rolls can be made cheaper than the leather roll coverings now universally employed. These finished cots can be shipped in quantities to the textile mills and can be readily applied to replace worn cots by relatively unskilled labor. The extra rolls now kept in stock by the textile mills because of the necessity of shipping the rolls to be re-covered, may be dispensed with.

Artificial cork is made by compressing a mixture of cork granules and an elastic binder and then heating to set the binder. The compression of this mixture flattens the granules in planes normal to the direction of compression. The flattened granules are held by the binder and permanently retain their flattened form.

This artificial cork has many of the characteristics of natural cork, such as resiliency and the capacity for being finished to a smooth mat surface, having a high coefficient of friction.

While coverings of natural cork have been proposed for drawing rolls, they have been unsuccessful, principally because of the pores of the natural cork forming small surface pits which caught the cotton fibres. These pores in the natural cork bark are filled with a dark brown soft crumbly substance known as "cork meal", which in time worked out of the pores thus increasing the size and depth of the pits. It has been proposed to employ artificial cork for covering the drawing rolls of spinning frames by winding thin sheets of artificial cork around the rolls, as shown in my prior Patent No. 1269682. In such sheets of artificial cork the flattened cork granules lay in the plane of the sheet. These granules tended to puff up, particularly in the humid atmosphere of the cotton mills, and to flake off and to roughen the surface of the roll, which caused the cotton to be caught and lapped around the roll. The flattened granules of artificial cork are in the general form of substantially flat disks or plates and since such plates lay flat on the surface

of the roll, they were held in place only by virtue of the binder employed. When the strip was wound around the roll body a greater strain was put on the binder and the tendency to flake off was correspondingly increased. Moreover, since the direction of compression of the cork granules was normal to the surface of the rolls, the tendency of the cork granules to expand tended to increase the diameter of the roll.

In forming the roll covers in accordance with the present invention, the flattened granules of cork are disposed edgewise to the working surface of the roll, so that the working surface of the roll is formed of transverse sections through the flattened granules. The granules instead of lying flat on the working surface, have their long dimensions at an angle and preferably normal to the surface, so that the granules are rooted in the body of the artificial cork roll cover. This not only prevents the cork granules from flaking or scabbing off from the surface, but permits a much smoother and better surface to be finished on the roll. Any tendency which the cork granules have to expand will take place in a direction parallel to the roll surface and preferably axially of the roll, so that the roll cover will not tend to expand or to become loosened on the roll body.

In the accompanying drawings, which illustrate the preferred embodiment of the invention,—

Figure 1 is an elevation of the usual top roll of a spinning frame provided with my artificial cork cots;

Figure 2 is a similar view showing the cots in cross section;

Figure 3 is a perspective view of one of the cots;

Figure 4 is a section along the line IV—IV of Figure 1;

Figure 5 is a perspective view of a cot before finishing its working surface;

Figure 6 is a perspective view of the cylindrical piece of artificial cork from which the cot is made;

Figure 7 is a section through the mold, showing the compression of the artificial cork;

Figure 8 is a perspective view of a block of artificial cork, which may also be used in making the cots;

Figure 9 is a perspective view of a portion of a large block of artificial cork, showing how it is cut to form the blocks for making the cot;

Figure 10 is a view of a portion of a large block of cork, showing how a slice may be taken off for covering a textile roll; and

Figure 11 is a section through a textile roll with such slice of cork wound on it as a sleeve.

Referring to the preferred embodiment of the invention illustrated in the drawings, reference numeral 1 indicates the metal body of the usual type drawing roll of a spinning frame. This metal body has two cots or sleeves indicated by reference numeral 2. One of these cots is shown in perspective in Figure 3. It has a body 3 of artificial cork having a highly finished working surface 4. The cot has a cylindrical opening 5 extending through it so that it may be readily slipped over the metal body 1 of the roll. The cot is held on the roll body by a coating 6 of a suitable cement such, for example, as a shellac base cement.

When a cot becomes worn it can be readily stripped from the roll body and a new cot readily substituted.

The relationship of the granules of the artificial cork to the working surface of the cot can perhaps be best understood from the description of the process of making the cots, which will now be described.

In making the artificial cork, any of the usual formulæ and methods now commonly in use for making artificial cork may be employed such, for example, as that disclosed in my prior Patent No. 1,269,682. In making the artificial cork, granulated natural cork is employed. The granules are larger than the particles of cork in cork flour used for making cork containing composition such as linoleum, but must not be too large. In making artificial cork for textile roll cots, the cork granules should pass through $\frac{3}{8}$ inch openings and over a 30 mesh to the inch screen. The cork granules are preferably of a size to pass through a 10 mesh to the inch screen and over a 24 mesh to the inch screen. A mixture is formed of such natural cork granules and an elastic binder. The binder preferably employed and the one which is practically universally employed in making artificial cork is a glycerine-gelatine binder. In making up artificial cork for the textile cots, I prefer to mix 100 pounds of granulated cork of the size specified, 10 pounds of glycerine and 5 pounds of gelatine. About 20 ounces of commercial liquid formaldehyde, or its equivalent, as a coagulant is added to the mixture. The materials are thoroughly mixed and are pressed in a mold, the pressure preferably being such as to reduce the mass of the mixture to approximately $\frac{1}{8}$ of its initial form. The mixture while confined in the mold is heated preferably to about 250° F. to set the binder. After the mass is cooled it is removed from the mold and employed for making the textile roll cots.

In Figure 7 is illustrated the preferred method of making the body of artificial cork to be formed into the cots. A mixture of the cork granules and the binder is compressed in a long mold 7 to form a cylindri-

cal rod 8. The pressure is applied in the direction indicated by the arrow 9 axially of the rod.

The artificial cork so formed consists of flattened cork granules, the granules having the general shape of disks or pan cakes. The planes in which these flattened granules lie, or the planes which may be termed the planes of compression, are disposed normally to the direction of compression, that is, the direction in which the pressure was applied to the mixture to compress it into the body of the compressed artificial cork. The flattened granules have the resiliency of compressed natural cork, which resiliency is increased somewhat by the glycerine employed in the binder. The binder is elastic so that the body of artificial cork has a resilience or elasticity as great, if not greater, than natural cork. The process of granulating and forming the cork into the mixture insures a much more homogenous body than that possessed by natural cork.

The rod or body of artificial cork 8 is next cut into lengths 10, one of which is shown in Figure 6. The hole 5 is next cut through the length of cork to form the unfinished cot shown in Figure 5. Next the working surface of the cot is finished, preferably by grinding to form a very smooth mat frictional working surface. The cot is then in condition to be shipped to the textile mill and applied to a drawing roll.

The cot is applied to the drawing roll by slipping it over the metal body 1 of the roll. A suitable cement, such as shellac base cement, is applied to the metal body to hold the cot in place.

The cots can usually be finished sufficiently accurately to be applied and used without further finishing for drawing the fiber for making yarns of about No. 8 size of thread or coarser. For finer yarns it is advisable to regrind the cots after they are applied to the metal roll bodies. This re-grinding may be carried out on well known grinding machinery, and is done for the purpose of insuring an absolute alignment or parallelism between the cylindrical surfaces of the two cots which are mounted on the same metal body. This insures continuous lines of contact between the cork cots and the bottom roll throughout the length of the cots and uniform pressure throughout such lines of contact, so that the fiber for even the finest yarns is drawn uniformly and prevented from "licking" or "snapping," i. e., the winding around the bottom roll.

As will be readily understood from the above description of the process of making the cot, the flattened granules of cork are disposed edgewise to the working surface of the roll. The planes of compression or planes in which the flattened disk-like granules lie, are preferably at right angles to the

working surface of the roll, although this right angular relationship is not absolutely essential so long as the flattened granules are disposed sufficiently edgewise to the working surface of the roll so as to be rooted into the surface and not readily flaked off. As can readily be seen, the flattened granules instead of lying flat on the surface of the roll where they will tend to flake off, extend down into the body of the cot. The exposed surface of each granule which is, of course, a cross section taken transversely through the granule, is less than the surface of the granule which is held by the binder in the body of the cot.

The direction of compression of the cork granules is preferably axially of the cot. The tendency of the artificial cork to expand, which is in the direction of its compression, will therefore be longitudinal of the roll. Such tendency to expansion will therefore cause no increase in the diameter of the cot. Moreover, it may be readily resisted by cementing the cot on the metal roll body.

When the working surface of the cot is finished by turning or grinding, or by both, a small amount of material is removed so that the finished surface is formed by transverse sections through the exposed or surface flattened granules. The exposed cross section through a granule is small compared with the flat surface of the granule so that the finished surface is made up of sections through a much larger number of surface granules than would be the case if the granules lay in the plane of the surface, as in my prior Patent No. 1,269,682. This not only forms a surface in which the surface granules are securely held and have little if any tendency to flake off, but also a surface which is capable of receiving and retaining a very smooth mat finish particularly adapted to exert the proper frictional grip on the fine fibers of the cotton or other textile material.

The flattened cork granules are sufficiently large to extend into or be rooted into the body of the cot sufficiently so as not to powder off or crumble, as would be the case if powdered or ground cork or cork flour were employed. The binder employed is elastic, so that the cot has the requisite resiliency to properly grip the textile fibers.

While I prefer to make the cots from cylindrical rods of compressed artificial cork, the cots may be otherwise made. For example, a block of artificial cork 11 as shown in Figure 9, may be made up having a thickness equal to the length of the cots to be made. In making such block the direction of compression is that indicated by the arrow 9 in Figure 9. Such block may be cut into smaller blocks 13 as indicated in Figures 8 and 9 and these blocks may be then

turned into cylindrical lengths such as shown in Figure 6.

While it is preferred to make the cots in the form of sleeves adapted to be slipped over a textile roll, the textile rolls may be covered by winding a strip of cork around the roll. Such a procedure is indicated in Figures 10 and 11, in which reference numeral 11 indicates a portion of a block of compressed cork, the direction of compression being indicated at 9. A strip of cork 14 is cut from the edge of the block, as indicated in Figure 10, so that the flattened granules will be disposed edgewise to the surface of the strip. The strip 14 may then be suitably skived and wound about and cemented to the metal body 1 of a textile roll, as shown in Figure 11.

While I have specifically illustrated and described the preferred embodiment of my invention, it is to be understood that the invention is not limited to the details above set forth, but that the invention may be otherwise embodied within the scope of the following claims. It will also be apparent that the steps in the process are not limited to the sequence above described, since certain of them may be obviously interchanged.

I claim:

1. A textile roll having a working surface of compressed artificial cork, the planes of compression of the cork granules being at an angle to the working surface of the roll, substantially as described.

2. A textile roll having a working surface of compressed artificial cork consisting of resilient compressed flattened cork granules and an elastic binder, the flattened granules being disposed edgewise to the working surface of the roll, substantially as described.

3. A textile roll having a working surface of compressed artificial cork consisting of resilient compressed flattened cork granules and an elastic glycerine-gelatine binder, the flattened granules being disposed edgewise to the working surface of the roll, substantially as described.

4. A textile roll having a working surface formed of cork granules of a size to pass through three-eighths inch openings and over a thirty mesh to the inch screen compressed into flattened form and held by an elastic binder, the flattened granules being disposed edgewise to the working surface of the roll, substantially as described.

5. A textile roll having a working portion composed of compressed artificial cork consisting of resilient compressed flattened cork granules and an elastic binder, the working surface of the roll being formed by transverse sections through the granules, such granules being disposed edgewise to the working surface of the roll to be rooted to the body of the compressed cork, substantially as described.

6. As an article of manufacture, a cot for textile rolls consisting of a tubular sleeve adapted to be slipped over a textile roll and formed from compressed artificial cork, the planes of compression of the cork granules being at an angle to the working surface of the cot, substantially as described.

7. As an article of manufacture, a cot for textile rolls consisting of a tubular sleeve adapted to be slipped over a textile roll and formed from compressed artificial cork, the direction of compression of the cork being substantially parallel to the axis of the cot, substantially as described.

8. As an article of manufacture, a cot for textile rolls consisting of a tubular sleeve adapted to be applied directly to the body of a textile roll and formed from compressed artificial cork consisting of resilient compressed flattened cork granules and an elastic binder, the flattened granules being disposed edgewise to the working surface of the cot, substantially as described.

9. As an article of manufacture, a cot for textile rolls consisting of a tubular sleeve adapted to be applied directly to the body of a textile roll and formed of compressed artificial cork consisting of resilient flattened cork granules and an elastic glycerine-gelatine binder, the flattened granules being disposed edgewise to the working surface of the cot, substantially as described.

10. As an article of manufacture, a cot for textile rolls consisting of a tubular sleeve adapted to be applied directly to the body of a textile roll and formed from compressed artificial cork consisting of resilient compressed flattened cork granules and an elastic binder, the direction of compression of the cork being substantially parallel to the axis of the cot, substantially as described.

11. As an article of manufacture, a cot for textile rolls consisting of a tubular sleeve adapted to be slipped over a textile roll and formed from compressed artificial cork consisting of resilient compressed flattened cork granules and an elastic binder, the working surface of the cot being finished so as to expose cross sections through the surface granules, such granules being flattened and set edgewise to the surface to be rooted in the body of the compressed cork, substantially as described.

12. The method of covering textile rolls, which includes compressing cork granules mixed with an elastic binder to form compressed artificial cork, forming a cot having its working surface at an angle to the planes of compression of the cork granules, and applying the cot directly to the body of the roll, substantially as described.

13. The method of covering textile rolls, which includes compressing cork granules mixed with an elastic binder to form compressed artificial cork, forming therefrom a

cot having its axis substantially parallel to the direction of compression of the cork, and applying the cot directly to the body of the roll, substantially as described.

5 14. The method of covering textile rolls, which includes compressing a mixture of cork granules and an elastic binder to form compressed artificial cork consisting of resilient compressed flattened cork granules
10 held by the elastic binder, forming therefrom a cot having its working surface substantially normal to the planes of compression of the cork granules, and applying the cot directly to the body of the roll, substan-
15 tially as described.

15 15. The method of making seamless tubular cots for textile rolls, which includes compressing a mixture of cork granules and an elastic binder and shaping it to form a
20 cylinder of compressed artificial cork having the direction of its compression substantially parallel to its axis, forming an opening through the cylinder to adapt it to slip over a textile roll, and finishing the
25 working surface of the cot, substantially as described.

30 16. The method of making tubular cots for textile rolls, which includes compressing a mixture of cork granules and an elastic binder to form compressed artificial cork consisting of resilient compressed flattened cork granules held by the binder, and forming therefrom a cot having its working
35 surface at an angle to the planes of compression of the cork granules and having an opening therethrough to adapt it to be slipped over a textile roll, substantially as described.

40 17. The method of making tubular cots for textile rolls, which includes compressing a mixture of cork granules and an elastic binder to form compressed artificial cork consisting of resilient compressed flattened cork particles held by the binder,
45 forming therefrom a cot having its working surface substantially parallel to the direction of compression of the cork particles, and finishing the working surface of the cot so as to expose transverse sections of the
50 granules, substantially as described.

18. The method of making tubular cots for textile rolls, which includes compressing a mixture of cork granules and an elastic binder and shaping it to form a tubular
55 cot consisting of resilient compressed flattened cork particles held by the binder and disposed edgewise to the working surface of the cot, and finishing such working surface so as to expose transverse cross sections of the granules, substantially as described. 60

19. The method of covering textile rolls, which includes compressing cork granules mixed with an elastic binder to form compressed artificial cork, forming therefrom a
65 cot having its working surface at an angle to the planes of compression of the cork granules, applying the cot to the body of the roll, and finishing the surface of the cot, substantially as described.

20. The method of covering textile rolls, 70 which includes compressing cork granules mixed with an elastic binder to form compressed artificial cork, forming therefrom a cot having its axis substantially parallel to the direction of compression of the cork, 75 applying the cot directly to the body of the roll, and finishing the surface of the cot, substantially as described.

21. The method of covering textile rolls, which includes compressing cork granules 80 mixed with an elastic binder to form compressed artificial cork, forming a cot having its working surfaces at an angle to the planes of compression of the cork granules, grinding the surface of the cot, cementing 85 the cot directly to the body of the roll, and regrinding the surface of the cot, substantially as described.

22. The method of covering textile rolls, which includes compressing a mixture of 90 cork granules and an elastic binder, shaping it to form a cylindrical sleeve or cot having its direction of compression substantially parallel to its axis, finishing the surface of the cot, applying the cot to the body 95 of the roll, and re-finishing the surface of the cot, substantially as described.

In testimony whereof I have hereunto set my hand.

HERMAN F. BUSCH.