July 16, 1929. E. M. BIDWELL 1,720,715

MECHANISM FOR WORKING FIBROUS MATERIAL

Filed Oct. 15, 1926

Fig. 1.

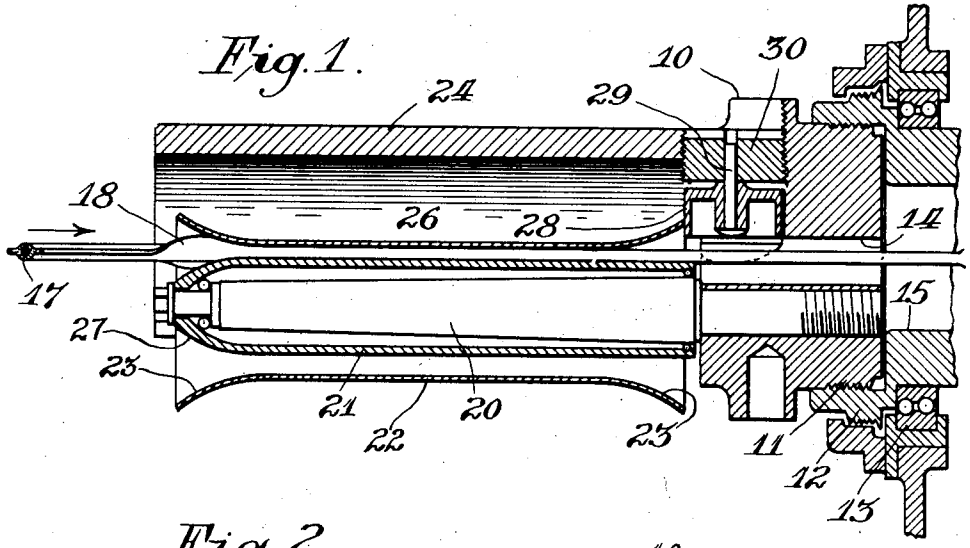


Fig. 2

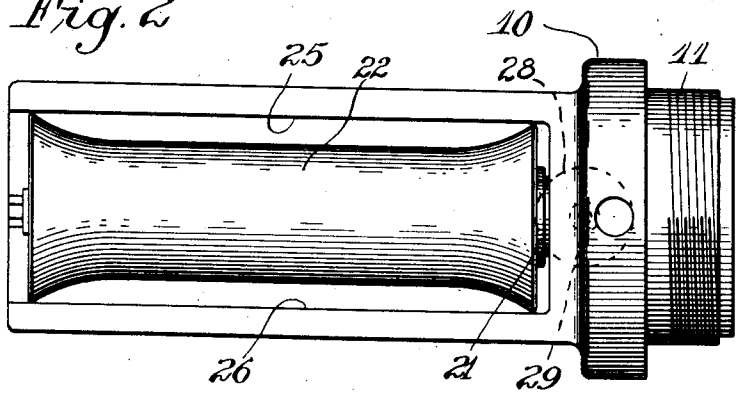


Fig. 3.

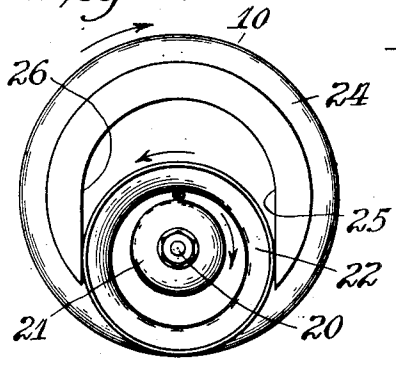
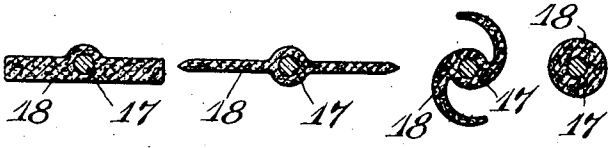


Fig. 4. Fig. 5. Fig. 6. Fig. 7.



Inventor
Edgar M. Bidwell,
By H. A. Hattison.
Atty.

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UNITED STATES PATENT OFFICE.

EDGAR MERRITT BIDWELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

MECHANISM FOR WORKING FIBROUS MATERIAL.

Application filed October 15, 1926. Serial No. 141,699.

This invention relates to improvements in mechanism for working fibrous material, and more particularly to mechanism for forming pulpous material to constitute a homogeneous coating for cores in strand form, such as wire and the like.

The primary object of the invention is to provide an improved mechanism for rapidly and efficiently forming fibrous material on a core to constitute a homogeneous and uninterrupted coating therefor conforming to the shape of the core.

In accordance with the general features of the invention there is provided in one embodiment thereof a rotatable member having an axial opening adapted to accommodate a core with a coating of pulp attached thereto. A freely rotating roll cooperating with a sleeve loosely carried thereby serves to form the pulpous material around the core to constitute a coating therefor conforming to the shape of the core. The core with its attached pulpous material is passed between the outer cylindrical surface of the roll and the inner cylindrical surface of the sleeve.

Other features and advantages of the invention will become apparent in the following detail description, reference being had to the accompanying drawing, wherein

Fig. 1 is a longitudinal section of a forming mechanism embodying the features of the invention;

Fig. 2 is a front view thereof;

Fig. 3 is an end elevation thereof;

Figs. 4 and 5 are enlarged sectional views illustrating the manner in which the pulp is applied to the core before it is delivered to the forming mechanism, and

Figs. 6 and 7 are enlarged sectional views showing the formation of the pulp coating immediately after starting the forming operation and after the completion of the forming operation, respectively.

The forming mechanism herein shown and described is adapted to be used in conjunction with the apparatus for coating cores with pulp shown and described in patent to H. G. Walker, No. 1,615,423, issued January 25, 1927. In the operation of this apparatus a core is brought into contact with pulpous material deposited upon a foraminous member and then an additional amount of pulpous material is deposited upon the core and the foraminous member. The pulp so deposited and the core are then brought into contact with a felt covered squeezing roll which cooperates with the foraminous member to squeeze out the "free liquid" from the pulp. The partially dried pulp adheres to the core in the form of a ribbon with the core substantially centrally located therein, as is shown in Fig. 4 of the accompanying drawing. The core with the pulp ribbon attached thereto is then passed through a plurality of squeezing rolls which impart to the pulpous ribbon a contour such as is illustrated in Fig. 5.

A forming mechanism embodying the features of the present invention is designed to receive a core with its pulpous ribbon from the squeezing rolls and wrap the projecting edges of the ribbon around the core and around each other to form a coating for the core which substantially conforms to the shape thereof. The appearance of the coating immediately after starting the forming operation is shown in Fig. 6 and its appearance after the forming operation is completed is shown in Fig. 7.

Referring now to the drawing in detail, the numeral 10 indicates a supporting head or carrier having a threaded portion 11 by means of which it is secured to a sleeve 12 rotatably journaled in a plurality of bearings, one of which is shown at 13. The sleeve 12 may be rotated by any suitable means and thus constitutes means for rotating the carrier 10. The carrier 10 and sleeve 12 are provided with aligned, central longitudinal apertures 14 and 15, respectively, for accommodating a core 17 with its attached pulpous coating 18 drawn axially therethrough by any suitable means (not shown).

Secured to the carrier 10 and disposed eccentrically with respect to the rotating axis thereof is a forwardly projecting spindle 20 upon which is rotatably supported a cylindrical roll 21. Loosely suspended upon the roll 21 is a cylindrical sleeve 22 which is flared at each end, as indicated at 23. The arrangement is such that as the core with its attached ribbon of pulp is passed axially through the rotating carrier 10 the pulpous ribbon is engaged by the outer cylindrical surface of the roll 21 and the inner cylindrical surface of the sleeve 22, the latter being held in pressing engagement with the pulpous ribbon due

to centrifugal force generated by the rotation of the carrier. During the rotation of the carrier, the roll 21 and the sleeve 22 rotate on their own axes in opposite directions due to their rolling engagement with the pulp covered core. The sleeve 22 is guided against lateral displacement by a forwardly projecting U-shaped portion 24 of the carrier 10. As shown in Fig. 3, the flared ends 23 of the sleeve 22 are designed so as to be slidable between parallel walls 25 and 26 of the U-shaped portion 24. Due to this construction, the sleeve 22 adjusts itself very quickly to variations in the diameter of the core or the thickness of the pulp coating.

The forward end of the roll 21 is tapered as indicated at 27 (Fig. 1) and cooperates with the flared forward end of the sleeve 23 to gradually wrap the pulpous ribbon around the core, thus preventing any stripping of the pulp from portions of the core. The formation of the pulpous ribbon after it is first acted upon by the forward ends of the roll 21 and sleeve 22 is illustrated in Fig. 6.

As the core with its attached ribbon of pulp is drawn axially through the rotating carrier in the direction indicated by the arrow (Fig. 1), the sleeve 22 also tends to move in the direction of the moving core due to its frictional contact therewith. The end of the sleeve engages an anti-friction roller 28 carried upon a pin 29 secured to a plug 30 threaded into the carrier 10 (Fig. 1). This construction permits the free rotation of the sleeve 22 on its own axis during the forming operation as hereinbefore described.

In the operation of the above described forming mechanism, the core with its attached ribbon of pulp 18 is drawn axially through the carrier 10 and the sleeve 12 in the direction indicated by the arrow (Fig. 1), the carrier and sleeve being rotated in the direction indicated by the arrow (Fig. 3), thus causing the roll 21 to be rotated bodily around the moving core. In so doing, the roll 21 also rotates on its own axis in the direction indicated by the arrow (Fig. 3) due to its frictional contact with the pulpous ribbon. Furthermore, the sleeve 22 also rotates on its own axis in a direction opposite to that of the roll 21, as shown by the arrow (Fig. 3), due to its frictional contact with the pulpous ribbon on the moving core. This arrangement causes the pulpous ribbon to be rolled on the core in the same manner as though the core and the pulpous ribbon were rolled on a table top with the palm of the hand. The rolling action of the roll 21 and sleeve 22 eliminates friction between the pulp and the forming surfaces, thus insuring against stripping of the pulp from portions of the core.

As hereinbefore described, the sleeve 22 is loosely suspended upon the roll 21. This construction permits the free passage of any irregularity such as a knot or abnormal thickness of the pulpous material, thus eliminating any danger of the core breaking due to such causes. Furthermore, due to centrifugal force, the sleeve 22 returns to its normal position immediately after the passage of any such irregularity, thus producing a coating which is of substantially uniform thickness throughout the length of the core.

What is claimed is:

1. In a mechanism for working fibrous material on a core, a forming member comprising an element surrounding the core and having a surface constantly in rolling engagement with said fibrous material.

2. In a mechanism for working fibrous material on a core, a forming member comprising an element loosely surrounding the core and having a cylindrical surface constantly in rolling engagement with said fibrous material.

3. In a mechanism for working fibrous material on a core, an element constantly engaging the fibrous material, and a member surrounding the core and having a cylindrical surface constantly in rolling engagement with said fibrous material.

4. In a mechanism for working fibrous material on a core, an element having a surface constantly in rolling engagement with the fibrous material, and a member loosely surrounding said element and the core.

5. In a mechanism for working fibrous material on a core, a plurality of forming members rotating in opposite directions and having surfaces constantly in rolling engagement with said fibrous material.

6. In a mechanism for working pulpous material on a core, a plurality of forming members rotating in opposite directions and having cylindrical surfaces of different diameters constantly in rolling engagement with said pulpous material.

7. In a mechanism for working pulpous material on a core, a forming member comprising a rotatable element having a cylindrical surface constantly in rolling engagement with the pulpous material, and a cylindrical sleeve loosely surrounding said rotatable member and the core, the inner cylindrical surface of said sleeve being constantly in rolling engagement with said pulpous material.

8. In a mechanism for working pulpous material on a core, a rotatable carrier, a freely rotating forming roll disposed eccentrically with respect to the rotating axis of said carrier and having a cylindrical surface constantly in rolling engagement with the pulpous material, and a cylindrical sleeve having a flared opening loosely sur-

rounding the forming roll and the core, the inner cylindrical surface of said sleeve being constantly in rolling engagement with said pulpous material.

9. In a mechanism for working pulpous material on a core, a forming member comprising an element loosely surrounding the core and having a cylindrical surface constantly in rolling engagement with the pulpous material, and means for preventing displacement of said element in a given direction.

10. In a mechanism for working pulpous material on a core, a rotatable carrier, a plurality of cylindrical forming members of different diameter supported by said carrier and having cylindrical pulp engaging surfaces, and means for rotating said carrier to cause the forming members to rotate in opposite directions.

11. In a mechanism for working fibrous material on a core, an element supported by the fibrous coated core and rotatable with respect to the core, and means cooperating with said element for forming the fibrous material on the core.

12. In a mechanism for working fibrous material on a core, an element with one of its ends flared, loosely supported by the fibrous coated core, and means cooperating with said element for forming the fibrous material on the core.

13. In a mechanism for working fibrous material on a core, a cylindrical element normally in engagement with the fibrous material, and means cooperating with said element for causing a wrapping of the fibrous material around the core upon the advancement of the fibrous coated core.

In witness whereof, I hereunto subscribe my name this 29th day of Sept. A. D., 1926.

EDGAR MERRITT BIDWELL.