

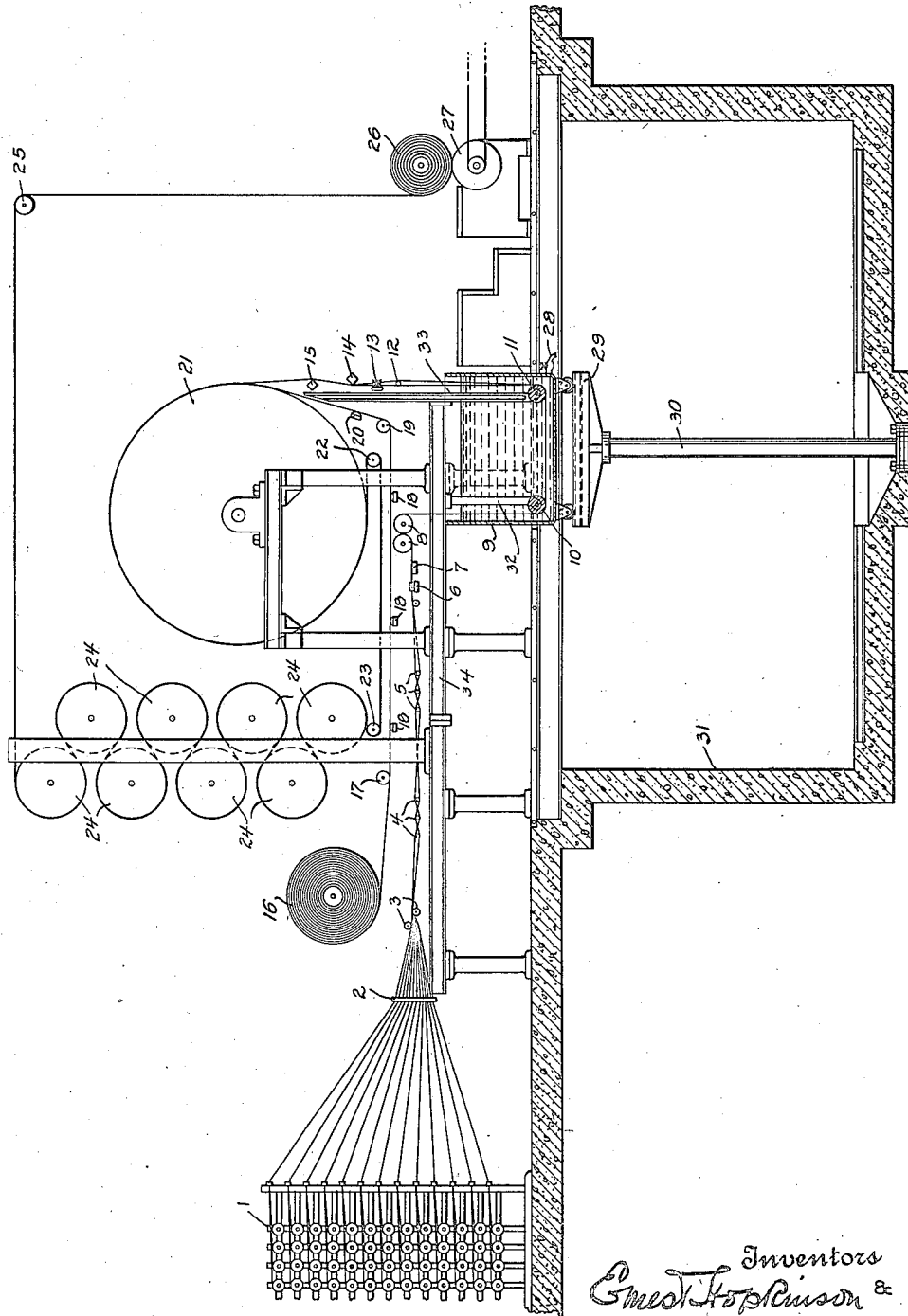
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APPARATUS FOR THE PRODUCTION OF WEFTLESS RUBBERIZED CORD FABRIC

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APPARATUS FOR THE PRODUCTION OF WEFTLESS RUBBERIZED CORD FABRIC.

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To all whom it may concern:

Be it known that we, ERNEST HOPKINSON and ALFRED E. JURY, both citizens of the United States, and residents of New York, county of New York, State of New York, and Rutherford, county of Bergen, State of New Jersey, respectively, have invented certain new and useful Improvements in Apparatus for the Production of Weftless Rubberized Cord Fabric, of which the following is a full, clear, and exact description.

This invention relates to apparatus for the production of fabrications of rubber and filamentary material, particularly for the production of sheets of such material for use in the manufacture of cord tires, hose and other articles.

The principal object of the invention is to provide a simple, efficient apparatus for treatment of filamentary material such as cords with rubber preferably in the form of latex and to provide particularly a convenient means for securing a uniform sheet of rubber-coated material. Another object of the invention is to provide a convenient means for making adjustments in the apparatus or repairing any break in the material being operated upon without effecting the thickness of the coat of rubber applied to the cords or other characteristic of the product.

The invention accordingly consists in an apparatus comprising a source of supply of independent unwoven warp elements, means to apply rubber solution thereto, means to apply a backing after such treatment, and means to dry the rubber-treated elements.

In the drawing is shown a diagrammatic elevation partly in section of an apparatus constituting a preferred embodiment of the invention.

Referring now more particularly to the drawing, cord or other filamentary material wound on spools and representing warp-like elements is arranged to be delivered from a creel 1. The individual cords are threaded through eyes on the creel and eyes on the thread-board 2 from which they pass through guide rods 3 over two series of lease rods 4 and 5 to an idler, thence through an expansion comb 6 and over a plate 7 to idle rolls 8 and on their way to a tank 9 providing a supply of latex. The

devices which act upon the cords prior to their entry into the tank 5 serve preferably to arrange the cords so that each one is parallel and touches cords on either side thereof.

Mounted within the tank opposite one another and adjacent respectively the lower corners of the tank are rolls 10 and 11 under which the cords pass. The cords are passed from the roll 11 upwardly and emerge from the latex passing over a lease rod 12, an expansion comb 13, and adjustable doctor blades 14 and 15 which serves to scrape excess latex from the cords.

After leaving the doctor blade 15 the cords are laid on a liner sheet of sateen or similar material which serves as a flexible carrier or support for the latex-treated cords. This liner material is fed from a roll 16, passes over a guide roll 17 and a series of scutchers 18 to a guide roll 19 and thence over another scutcher 20 to the face of a large preferably copper drum 21. The liner with the latex treated cords superposed passes around this drum over a guide roll 22 to a second guide roll 23 and thence onto a series of dry cans 24 comprising two vertically arranged rows staggered with respect to one another, the liner and cords passing from the can of one row to the adjacent can of the other row. Leaving the last can the material passes over a guide roll 25 and thence downwardly to a roll 26 on which it is wound. The roll is driven by a second roll 27 which serves to rotate the roll 26 and cause the material to be wound thereon.

The tank 9 containing the latex is provided with a spigot 28 by means of which it may be drained for cleaning purposes or any other reason. In order that the latex may be moved into and out of contact with the cords as desired the tank is mounted on a platform 29 which is moved up and down by a hydraulically operated plunger 30. The plunger is mounted in the floor of a well 31 sunk below the level of the floor. As shown the floor or an I-beam passing over the well support the remaining portions of the apparatus described above. When the hydraulic plunger 30 is lowered tank 9 may be rolled away being provided with wheels for this purpose. The tank is arranged to be moved so that the latex is brought into or out of contact with the

cords in case it should become necessary to repair a break in a cord or to undertake any other operation where the presence of the latex would be objectionable. Furthermore when the machine is stopped for any purpose the tank may be moved away from the cords thus avoiding absorption of more rubber at one portion of their travel than at another. In other words if latex is allowed to remain in contact with the cords for a longer interval than is ordinarily consumed in the passage of the cords through the tank, it is found that a greater quantity of the rubber is taken up. This will cause objectionable variation in the finished product as ordinarily made. The rolls 10 and 11 are mounted respectively on brackets 32 and 33, which are mounted independently of the tank 9 so that upon removal of this tank the rollers with cords passing about them remain in their usual position. The brackets 32 and 33 are mounted on a framework 34 supported above the floor and which supports the drying devices and the liner roll. The bracket 33 in addition to its support of the roll 11 serves on its upper end to support the lease rod 12, expansion comb 13, idler 14 and doctor blade 15.

In carrying out the operation of the apparatus a series of cords or other filamentary material is led from the creel through the creel eyes 1, the thread board eyes 2, guide rollers, lease rods, idlers, the expansion comb and blade around the rolls 10 and 11. The tank 9 is filled with ammonia-treated or otherwise suitably preserved latex with which if desired has been mixed vulcanizing or compounding ingredients. The cords are then passed over the lease rods 12, expansion comb 13, idler 14 and doctor blade 15 whose angle is suitably adjusted to scrape off excess latex which thereupon falls back into the tank 9. The liner 16 is passed under the guide rolls and over the scutchers and brought to the drum 21, on whose face it lies. On the face of the liner away from the drum, latex treated cords are placed and this assemblage is then rotated with the drum, passed over the guide rolls 22 and 23, and then on to the series of dry cans, thence to the idlers 25, thence to the wind-up roll 26. The wind-up roll is then driven from an outside source of power and as the winding occurs, the succeeding portions of the cord pass from the creel through the various parts of the apparatus described.

It will be seen that the apparatus is simple and requires little attention on the part of operatives after it is once started. It is adapted to operate continuously to produce a uniform product. In case of accident to the material passing from the apparatus requiring stoppage, it may be stopped without causing absorption of more rubber by one part of the cords than by another. At

the same time the material passing through any part of the machine is readily accessible for repairs or other adjustment which may be necessary.

It is to be noted particularly that the liner 16 constitutes a part of the apparatus. It functions as a flexible carrier, support, or conveyor, for the relatively wet latex-treated cords and holds them parallel in substantially fixed relation while they are dried. It is inserted between the doctor bar 15 and the drum 21, and is interposed so as to receive the latex-treated cords on its outer surface and not only prevent gumming of the drum 21, but also, and particularly, to maintain the cords in more or less fixed relation while the moisture content is being removed or evaporated from the latex and the many cords tied together by the webs of plastic intervening between them.

As many apparently widely different embodiments of this invention may be made without departing from the spirit thereof, it will be understood that we do not intend to limit ourselves to the specific embodiment herein set forth except as indicated in the appended claims wherein the terms "warp elements" and "cords" are intended to comprehend any form of stress-resisting-element having the formation of a thread or cord as distinguished from a sheet or strip, and wherein also, the term "weftless fabric" is employed to comprehend any form of sheet material in which stress-resisting-elements, such as cords, are united together solely by intervening webs of plastic adhesive substance in contra-distinction to filling or weft threads, undesirably undulating the warp elements or cords.

Having thus described our invention, what we claim and desire to protect by Letters Patent is:—

1. An apparatus for manufacturing weftless fabric comprising in combination, a source of supply of independent warp-elements, means for applying a rubber-containing liquid thereto, means for drying the treated warp-elements, and additional means for holding the warp-elements against relative movement while drying them.

2. An apparatus for manufacturing weftless fabric including in combination, independent sources of cord supply, means for assembling the independent cords in contiguous sheet formation, a latex-filled container, means for passing the sheet of cords through the latex, a flexible carrier for receiving the wet sheet of cords and maintaining them in pre-determined spaced relation, and means for drying the latex-treated cords on the flexible carrier in such pre-determined relation.

3. An apparatus for manufacturing weftless fabric comprising a source of supply of independent cords, means for treating the

5 cords with latex, heated metallic devices for drying the treated cords including a plurality of rows of cans, in combination with, a flexible carrier for maintaining the cords in parallel relation while drying them, said cords on the carrier being conducted through the two rows of drying cans with their op-

posite faces alternately in contact with the cans.

Signed at New York, New York, this 27th 10 day of October 1921.

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