April 3, 1928. 1,665,194

H. D. STEVENS

BAND BUILDING MACHINE

Filed March 8, 1926 3 Sheets-Sheet 1

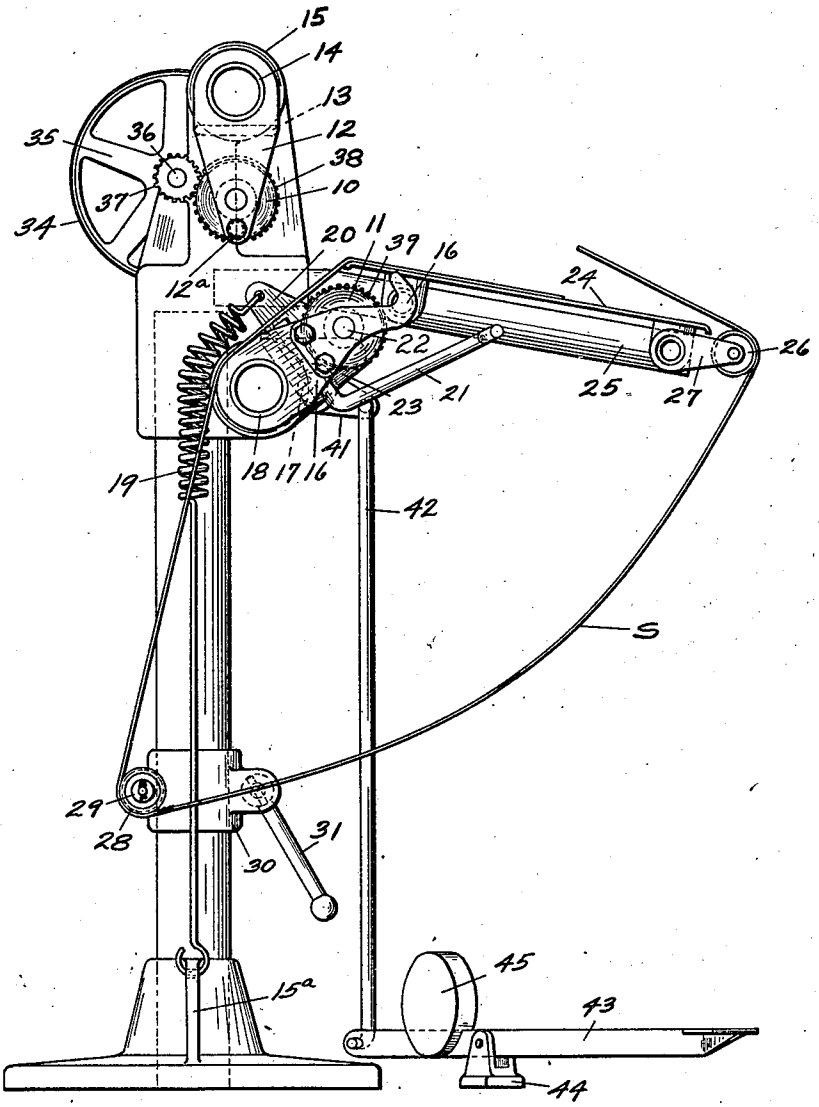


FIG.-1

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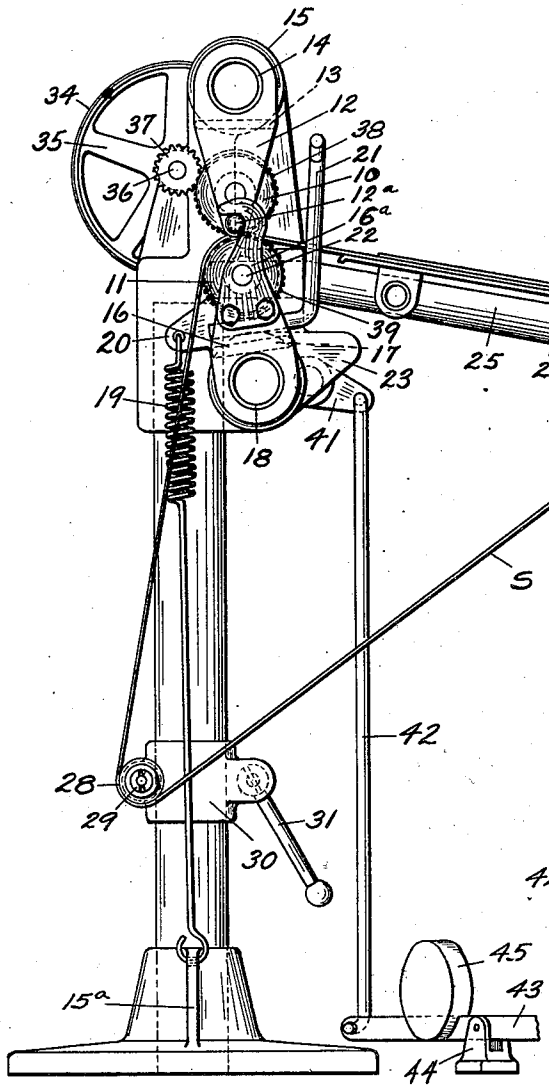


FIG.-2

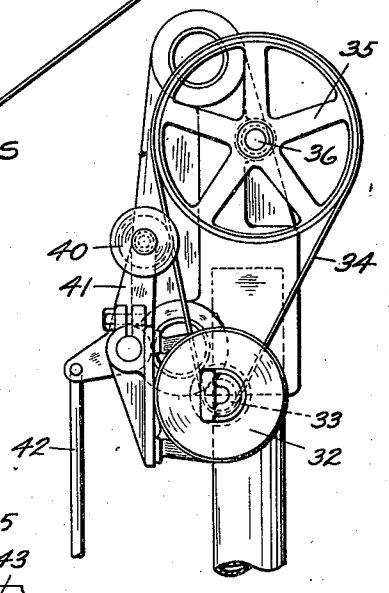


FIG.-4

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BAND BUILDING MACHINE

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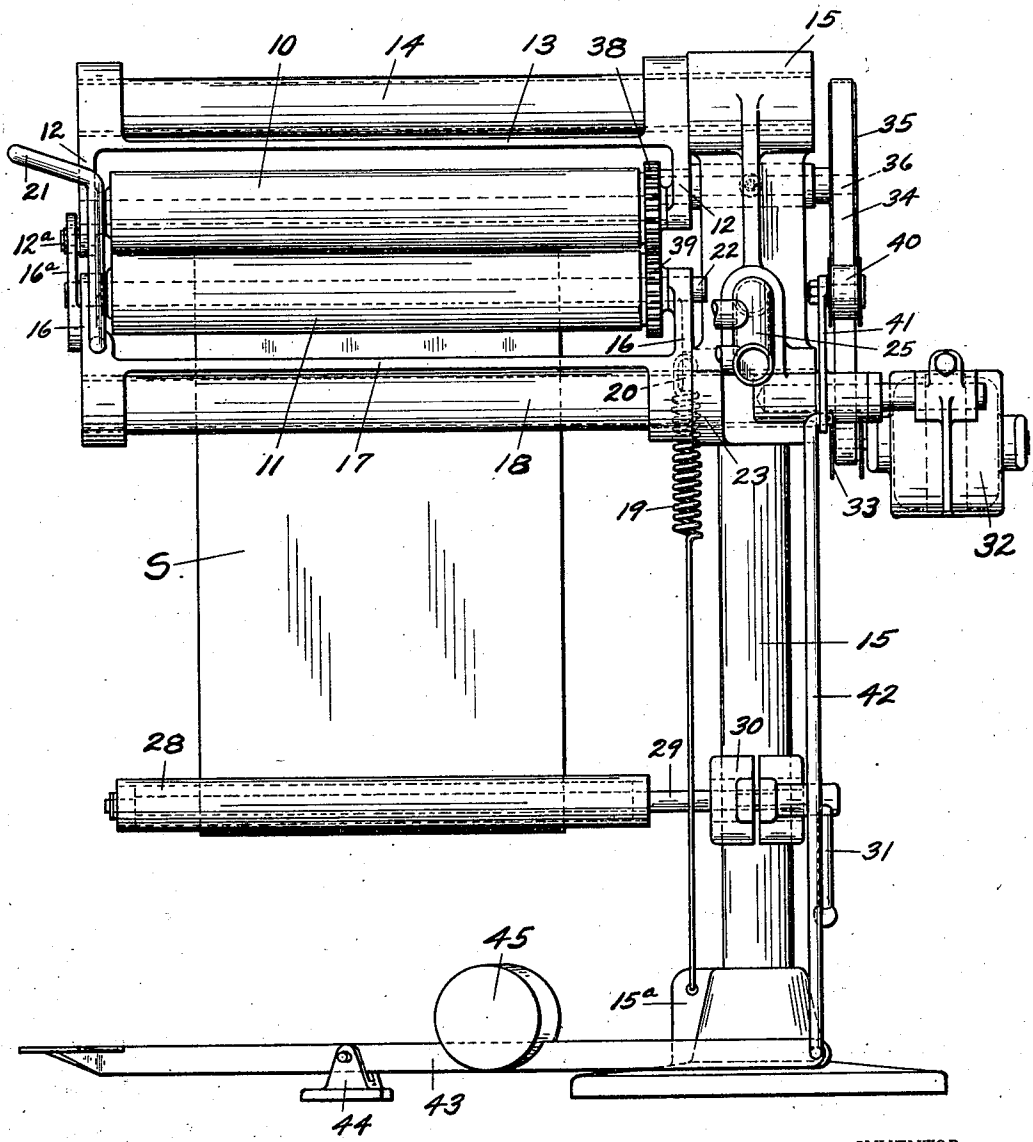


FIG. 3

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Patented Apr. 3, 1928. 1,665,194

UNITED STATES PATENT OFFICE.

HORACE D. STEVENS, OF AKRON, OHIO, ASSIGNOR TO THE FIRESTONE TIRE AND RUBBER COMPANY, OF AKRON, OHIO, A CORPORATION OF OHIO.

BAND-BUILDING MACHINE.

Application filed March 8, 1926. Serial No. 93,083.

This invention relates to machines for building bands from strips of rubberized fabric or cords, such as are used in constructing pneumatic tire casings, but which may be employed for making bands of rubberized fabric for other purposes.

The chief object of the invention is to provide a simple, inexpensive, but effective device for rapidly making bands of the above-described character.

A particular object of the invention is to provide, in combination, power driven pressure rollers and a support for guiding a strip of material therebetween, and on which the strip may be spliced or additional plies applied to form the band, and of means for moving the lower roller forwardly adjacent the rear edge of the support to facilitate threading of a strip of material about the support and the lower roller and also to facilitate removing of a completed band.

The foregoing and other objects are obtained by the apparatus illustrated in the accompanying drawings and described below. It is to be understood that the invention is not limited to the specific form thereof shown and described herein.

Of the accompanying drawings:

Figure 1 is a side elevation of a machine embodying the invention and illustrating the positions of the parts when the threading and splicing operations are performed on the first ply and also when a completed band is to be removed;

Figure 2 is a similar view of the machine illustrating the positions of the parts during application of additional plies;

Figure 3 is a front elevation of the machine with the ply guiding and splicing table or support removed; and

Figure 4 is a detail side view illustrating the means for driving the pressure rollers.

Referring to the drawings, 10 and 11 represent cooperating pressure rollers, roller 10 being journaled in arms 12, 12 of a bracket 13 secured on an arm 14 extending from the top of a standard 15 in which arm 14 is secured. Roller 11 is journaled on arms 16, 16 on a bracket 17 rockable on an arm 18 secured on standard 15 so as to extend from the standard parallel to, but spaced below and slightly forwardly of arm 14, whereby roller 11 may be swung toward or away from contact with roller 10 forwardly thereof. Means, such as a tensile spring 19, is provided to normally hold roller 11 in contact with roller 10, spring 19 being connected to the base 15^a of standard 15 and to a lug 20 connected to bracket 17. For moving roller 11 forwardly away from roller 10, a hand lever 21 is connected to bracket 17 for rocking the same. Spring 19 is so arranged as to contact a portion of bracket 17 when the latter is rocked forwardly to permit the weight of the roller 11 and arms 16 to overcome the spring and thus be held in its forward position until manually moved rearwardly by lever 21. A continuation of the shaft 22 on which roller 11 is journaled is arranged to engage a lug 23 fixed on standard 15 to limit swinging of roller 11 forwardly. A hook-like member 16^a is arranged on the outer arm 16 so as to engage over a stud 12^a on outer arm 12 to limit movement of roller 11 rearwardly and to hold the outer ends of rollers 10 and 11 together during a band rolling operation.

A table 24 preferably inclined upwardly toward the nip of rollers 10 and 11 is provided to serve as a guide and a support on which the fabric strips for forming the band may be spliced or applied one on the other. Table 24 is supported from standard 15 by a suitable bracket 25 so that its rear edge is spaced from the nip of rollers 10 and 11 sufficiently to permit swinging of roller 11 forwardly so as to lie beneath its rear edge (Figure 1), whereby the initial threading of a strip into the machine, the splicing thereof to form a band and the final removal of the completed band are facilitated. On the forward end of table 24 there is journaled on arms 27, 27 a roller 26 about which the band being formed is driven.

In order to present the band to rollers 10 and 11 in flat, unwrinkled condition, it is desirable to maintain the loop in the band below the table 24 and rollers 10 and 11 in taut condition. Accordingly a roller 28 is journaled on a rod 29 secured so as to be parallel to rollers 10, 11 and 26 on a collar 30 which is vertically adjustable on standard 15 so that the machine may be used for building bands of various sizes. Collar 30 may be secured in adjusted positions on standard 15 by any suitable form of clamping device operated by a lever 31.

Driving of the device is accomplished by means of a motor 32 secured on standard 15

and having a pulley 33 thereon for driving a belt 34 trained over a pulley 35 secured on a shaft 36. Shaft 36 is journaled in standard 15 and has a pinion 37 thereon meshing with a gear 38 on roller 10. Roller 11 has a gear 39 thereon adapted to mesh with gear 38 when it is in cooperation with roller 10. Belt 34 is arranged normally to slip so as not to drive rollers 10 and 11. In order to tighten up said belt at will to drive rollers 10 and 11, a pulley 40 is arranged to be moved against the outer side of one reach of belt 34, pulley 40 being journaled on one arm of a bell-crank lever 41 rockable on standard 15. A rod 42 is provided to rock lever 41 being connected to the other arm thereof and to a pedal lever 43 fulcrumed at 44. The lever 43 has a weight 45 thereon normally urging pulley 40 away from belt 34.

In use, the parts will be operated to the positions shown in Figure 1. A fabric strip S of proper width and length for forming the band is threaded between rollers 10 and 11 and about rollers 28 and 26 and its ends are spliced on table 24. Lever 21 is then swung rearwardly and pedal 43 depressed, whereby the band will be driven along a substantially triangular path. Additional plies indicated at P, Figure 2, may be added as desired, the leading end of each ply being applied to the band on table 24 and the plies being progressively rolled into intimate contact as will be understood.

After the band is completed, pedal 43 is released and hand lever 21 is swung forwardly, thus permitting easy removal of the band from about rollers 11, 28 and 26 and table 24 to the left as shown in Figure 3.

Modifications of the invention may be resorted to without departing from the spirit thereof or the scope of the appended claims.

What is claimed is:

1. Apparatus for making endless bands of rubberized fabric, said apparatus comprising a relatively fixed upper pressure roller, means for driving the same, a lower pressure roller, a rockable support for moving the lower roller forwardly and downwardly from the upper roller, means yieldingly urging the lower roller against the upper roller, means adapted to drive the lower roller when in cooperation with the upper roller, a table forwardly of and inclined toward the nip of said rollers, a roller on the forward edge of said table, and a roller beneath the pressure rollers and said table for tensioning the band, the ends of the lower pressure roller and the tensioning roller being unobstructed on one side of the apparatus to permit slipping a band thereover.

2. Apparatus for making endless bands of rubberized fabric, said apparatus comprising a relatively fixed upper pressure roller, means for driving the same, a lower pressure roller, a rockable support for moving the lower roller forwardly and downwardly from the upper roller, means yieldingly urging the lower roller against the upper roller, a table forwardly of and inclined toward the nip of said rollers, a roller on the forward edge of said table, and a roller beneath the pressure rollers and said table for tensioning the band, the ends of the lower pressure roller and the tensioning roller being unobstructed on one side of the apparatus to permit slipping a band thereover.

3. Apparatus for making endless bands of rubberized fabric, said apparatus comprising a relatively fixed upper pressure roller, means for driving the same, a lower pressure roller, a rockable support for moving the lower roller forwardly and downwardly from the upper roller, means yieldingly urging the lower roller against the upper roller, a table forwardly of and inclined toward the nip of said rollers, and a roller beneath the pressure rollers and said table for tensioning the band, the ends of the lower pressure roller and the tensioning roller being unobstructed on one side of the apparatus to permit slipping a band thereover.

4. Apparatus for making endless bands of rubberized fabric, said apparatus comprising a relatively fixed upper pressure roller, a lower pressure roller, a rockable support for moving the lower roller forwardly and downwardly from the upper roller, means yieldingly urging the lower roller against the upper roller, a table forwardly of and inclined toward the nip of said rollers, and a roller beneath the pressure rollers and said table for tensioning the band, the ends of the lower pressure roller and the tensioning roller being unobstructed on one side of the apparatus to permit slipping a band thereover.

5. Apparatus for making endless bands of rubberized fabric, said apparatus comprising upper and lower pressure rollers, a support for swinging the lower pressure roller forwardly and downardly from the upper pressure roller, and a table inclined toward the nip of said rollers.

6. Apparatus for making endless bands of rubberized fabric comprising upper and lower pressure rollers, a table in front of and directed toward the nip of the rollers, and means for moving the lower roller away from the upper roller to a position under the adjacent edge of the table.

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