W. C. TYLER & E. NALL.

TENSIONING DEVICE.

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1,100,039.

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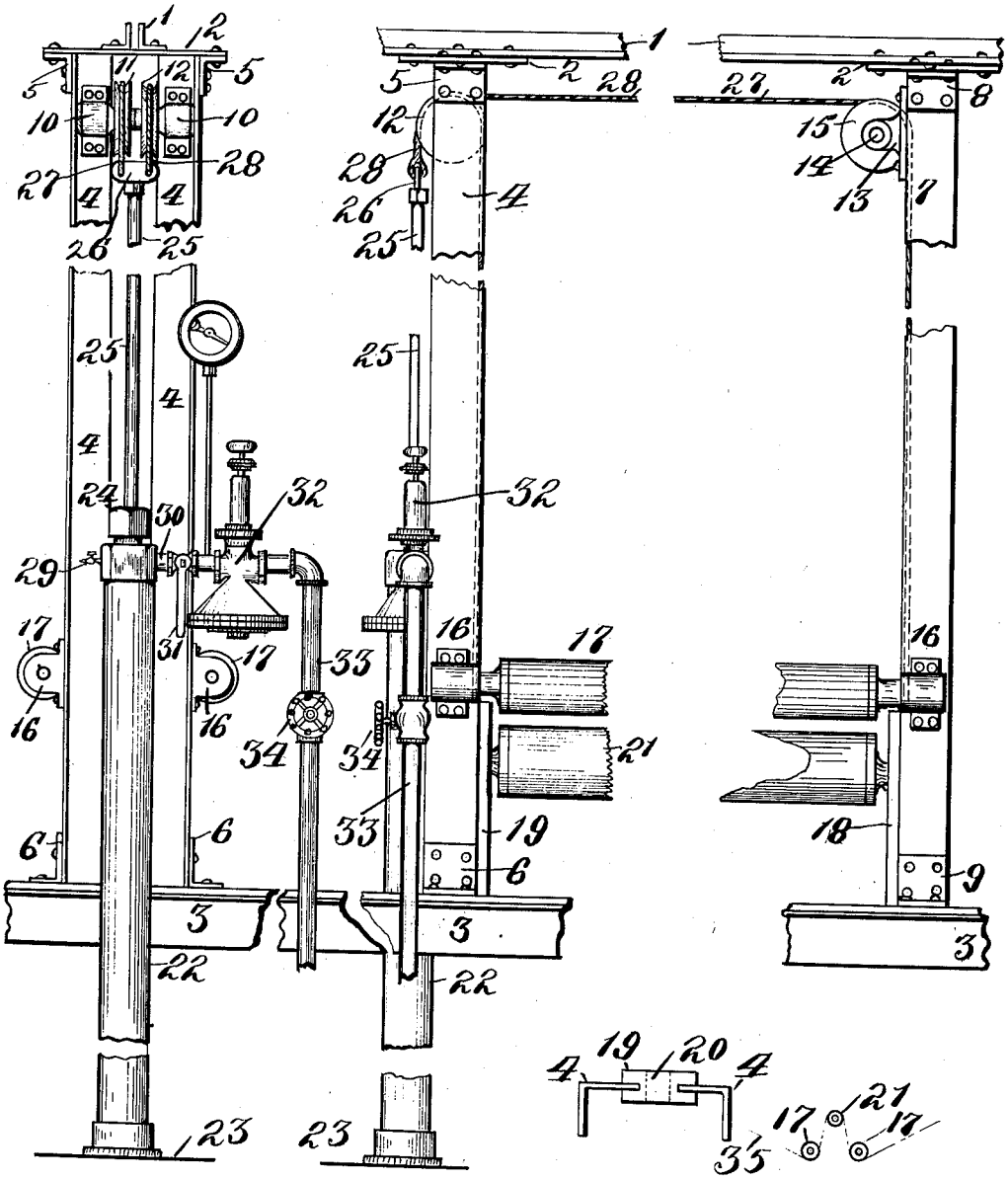


Fig. 1 Fig. 2 Fig. 3 Fig. 4

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UNITED STATES PATENT OFFICE.

WILLIAM C. TYLER AND EDWARD NALL, OF AKRON, OHIO, ASSIGNORS TO THE GOODYEAR TIRE AND RUBBER COMPANY, OF AKRON, OHIO, A CORPORATION OF OHIO.

TENSIONING DEVICE.

1,100,039. Specification of Letters Patent. Patented June 16, 1914.

Application filed April 7, 1913. Serial No. 759,501.

To all whom it may concern:

Be it known that we, WILLIAM C. TYLER and EDWARD NALL, citizens of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented new and useful Improvements in Tensioning Devices, of which the following is a specification.

This invention relates to tensioning devices for subjecting a continuously moving sheet of material such as fabric to a determined degree of tension.

The object of the invention is, generally speaking, to provide a device to impose tension on a continuously moving strip of fabric and is more specifically applicable for use in subjecting a strip of fabric passing from one calender to another during the process of coating the fabric with rubber so that in case one calender runs faster than the other the slack or surplus material is taken up by the tension of the device, and any bagginess of the fabric or strain thereon is prevented.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts constituting the invention to be hereinafter specifically described and illustrated in the accompanying drawings which form a part hereof wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings in which similar reference numerals indicate like parts in the different figures, Figure 1, is a view in end elevation of our improved device; Fig. 2, is a view in side elevation, showing the movable roll in its lower or inoperative position and without the fabric; Fig. 3, is a plan view of a view in side elevation, showing the movable roller; and, Fig. 4, is a diagrammatic view of the arrangement of the rolls, showing the movable roll in its upper or operative position.

Referring more specifically to the drawings, the reference numeral 1 denotes a pair of supported L-shaped beams which are secured to longitudinally-extending flat plates 2. The beams and plates 2 constitute the upper support of the frame of the machine. Extending from the plate 2 to a suitable support such as a floor 3 are a pair of L-shaped beams 4 the upper ends of which are secured to the plates 2 by angle-plates 5 and the lower ends are secured to the floor by angle-plates 6. Positioned opposite to the L-shaped beams 4 are a similar pair of L-shaped beams 7 secured at their upper ends by angle-plates 8 and at their lower ends 3 by angle-plates 9. The members constituting each pair of angle-beams are spaced from each other. Mounted on the lateral faces of the L-shaped beams 4 are journal boxes 10 in each of which is revolubly mounted a shaft (not shown), and on these shafts are mounted independent sheaves 11 and 12. Secured to the inner lateral faces of the beam 7 are a pair of journal boxes 13 revolubly supporting a shaft 14 on which is a sheave 15. Secured to the front and rear faces of each of the L-shaped beams 4 and 7 are journals 16 between each pair of which extend rotatable idler rolls 17. These journals 16 being placed on the front and rear faces of the beams 4 and 7 and projecting in opposite directions from each other serve to separate the idler rolls 17 from each other a considerable distance. Slidably mounted on the inner opposing edges of the L-shaped beams 7 is a carriage 18 and mounted on the same parts of the upright beams 4 is a carriage 19. The carriages are both provided with openings 20 (see Fig. 3), constituting bearings for the ends of a rotatable and vertically-shiftable roll 21. It will be noted that the roll 21 is shown in Fig. 2 in its extreme lower position, and as it is raised by mechanism to be described, the roll passes between the widely-separated rolls 17. It will be apparent that as the carriages 18 and 19 are vertically-shiftable on the inner opposing edges of the L-shaped beams 4 and 7 the latter constitute guides for permitting this vertical reciprocation.

Mounted at a convenient place adjacent to the pair of L-shaped beams 4 is a cylinder 22 which usually extends through the floor 3 and rests on a lower floor 23. The upper end of the cylinder 22 is provided with a packing gland 24 for a vertically-reciprocating piston-rod 25 the lower end of which bears a piston (not shown). The upper end bears a cross-head 26 consisting of a plate provided with a pair of apertures. Extending from the plate 26 over the sheave 11 is a rope, cord, or other flexible

member 27 which also passes around the sheave 15 and connects with the carriage 18. Also connecting with the cross-head 26 is a flexible member 28 passing over the sheave 12 and downwardly to connect with the carriage 19.

From the foregoing, it will be seen that as the piston-rod 25 is vertically reciprocated the two carriages 18 and 19 bearing the roll 21 will be shifted vertically and pass upwardly between the rolls 17 until its upward motion is arrested by the carriages encountering the sheaves 12 and 15 and the lower terminus of the movement of the roll 21 is limited by the carriages 18 and 19 encountering the floor 3. The upper end of the cylinder 22 is provided with a pet-cock 29 to permit the air above the piston to be exhausted at will.

Communicating with the upper end of the cylinder 22 is an inlet pipe 30 containing a valve 31 and to which is connected an atmospheric regulating device 32 the function of which is to maintain a constant pressure with respect to the fluid introduced into the cylinder and from the regulator 32 extends an inlet pipe 33 provided with a valve 34. The regulator 32 is of any ordinary type and forms no feature of this invention and any regulator capable of maintaining an even pressure of fluid within the cylinder 22 may be utilized.

In operation the fabric 35 (see Fig. 4) is carried under the idler roll 17 and upwardly over the roll 21 and down over the roll 17 to the calender, or vice versa, as the case may be. During the movement of the fabric over these rolls the regulator 32 is set to impose a pre-determined pressure on the piston cylinder 32, the result of which is to force downwardly the piston and the piston-rod 25 carrying with it the cross-head 27 which serves to raise the two carriages 18 and 19 and the roll 21 and by nicely adjusting this pressure the tension imposed on the fabric between the two idler rolls 17 may be regulated. If, for instance, any amount of slackness occurs during its passage to the calender, the pressure on the piston by raising the idler roll 21 takes up the surplus material, and if the strain on the fabric is greater than the pressure permitted by the regulator, enough air will leak past the piston under ordinary conditions, to permit the roll to move downwardly, relieving the strain or tension on the fabric.

We claim:

1. A tensioning device, comprising parallel guides, an idler roll mounted in bearings secured to said guides, vertically shiftable carriages movable between said guides, a roll mounted upon said carriages, and means for shifting the carriages and the roll supported thereon, consisting of suspending ropes each secured at one end to one of said carriages, guide sheaves over which said ropes pass, a fluid-operated cylinder containing a piston-rod, and a cross-head on said piston rod to which the other ends of said ropes are secured.

2. In a tensioning device, the combination with parallel vertical guides, of two idler rolls supported in bearings on opposite sides of said guides, and spaced apart to permit a shiftable roll to pass between them, carriages vertically-movable on said guides, suspending ropes secured each at one end to one of said carriages, guide sheaves for said ropes, a fluid-operated piston rod, a cross-head on said piston-rod to which the opposite ends of said ropes are secured, and a roll mounted upon said carriages and adapted to pass between said idler rolls by movement of said cross-head.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

WILLIAM C. TYLER.
EDWARD NALL.

Witnesses:
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