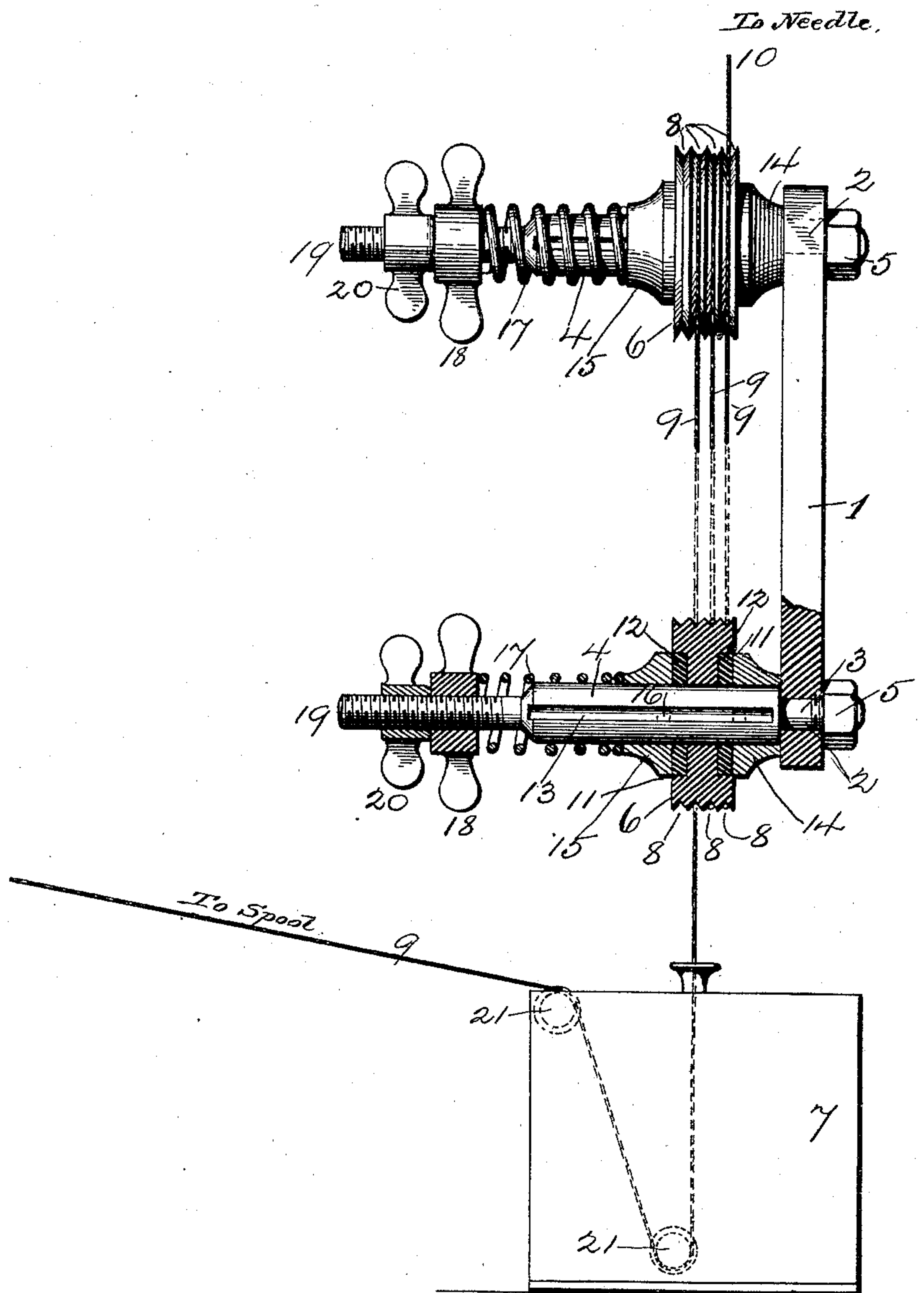


(No Model.)

F. H. HAGADORN & M. J. NICOL.  
TENSION DEVICE FOR SHOE SEWING MACHINES.

No. 474,381.

Patented May 10, 1892.



Witnesses

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# UNITED STATES PATENT OFFICE.

FRANK H. HAGADORN AND MATHEW J. NICOL, OF ROCHESTER, NEW YORK.

## TENSION DEVICE FOR SHOE-SEWING MACHINES.

SPECIFICATION forming part of Letters Patent No. 474,381, dated May 10, 1892.

Application filed April 30, 1890. Renewed February 24, 1892. Serial No. 422,690. (No model.)

*To all whom it may concern:*

Be it known that we, FRANK H. HAGADORN and MATHEW J. NICOL, citizens of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Tension Devices for Shoe-Sewing Machines; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the figures of reference marked thereon, which form a part of this specification.

Our invention relates, as hereinafter described and claimed, to an improved tension device for thread employed in sewing boots and shoes, and is especially designed for employment in connection with machines where in a waxed thread is used.

The accompanying drawing represents a side elevation, partly in section, of our improved thread-tension device, the course of the thread from the spool to and through the wax-pot to the needle being also shown in the figure.

Our improved thread-tension, denominated in the trade a "tension-truck," while especially adapted for attachment at the rear of boot and shoe sewing machines of the well-known Goodyear type, is also adapted for use in connection with boot or shoe sewing machines generally.

Inasmuch as the present invention relates solely to the thread-tension irrespective of the particular construction of the remaining parts of a sewing-machine and as the device can be attached to a machine in any suitable desired manner, we have not thought it necessary to show any one form of machine in connection therewith.

Attempts have been made, with varying approximation to success, to produce a satisfactory thread-tension device for boot or shoe sewing machines; but a serious objection present in the tension trucks or rollers now in use is that the thread is apt in practice to slip off the grooved roller or wheel, thereby destroying the tension, delaying the operation of the machine, and tending to spoil the work.

It is the object of our invention to maintain

a uniform tension on the thread and prevent it slipping from position on the guide-wheels, and we will now proceed to describe our novel device for accomplishing these results.

1 represents an upright or standard of iron or other suitable metal for supporting the thread guiding and tension mechanism. This standard is secured in any suitable manner at the rear of the machine. Through transverse holes 2 in the top and bottom ends of the standard 1 are passed the rear diminished threaded ends 3 of the shafts 4, nuts 5 serving to clamp said shafts to their supporting-standard 1.

6 represents the drums or wheels sometimes called a "tension-truck drum" for imparting tension to and guiding the thread in its passage from the wax-pot 7 to the needle. (Not shown.) These wheels 6 have a plurality of grooves 8 around their peripheries, as shown, and the thread 9, as it passes from the spool to and through the wax-pot 7, is carried over and around the respective wheels and within the grooves 8 therein, as clearly shown in the drawings. By thus passing the waxed thread as it comes from the wax-pot around the lower grooved wheel and back and forth between the respective wheels two or three times until it reaches the side of the upper wheel opposite to that at which it is first received it will be seen that the tension on the thread in its passage from the wax-pot to the needle is uniformly maintained and the possibility of the thread slipping from and on the wheels or out of position entirely prevented and the delivery of the thread to the needle at the point 10 at an even and proper tension insured. The wheels 6 are loosely journaled on the shafts 4, so as to revolve thereon with more or less freedom, according to the degree of tension it is desired to impart to the thread.

11 represents circumferential recesses formed in the side faces of the tension and thread guiding wheels 6 and within which are contained washers or blocks 12, of felt, rubber, or similar elastic material.

Upon the rear portion of the shafts 4, either formed integrally therewith or keyed thereto by a lug or feather engaging the groove 13 in said shaft, are blocks or collars 14, the rear of which abuts against the standard 1, while



the front ends of said blocks or collars 14 receive the impact of the elastic washers in the rear face of the tension-wheels 6.

15 represents collars similar in construction to those marked 14. The collars 15 slide loosely along the shafts 4, being guided and held from rotation thereon by lugs or feathers 16, working in the grooves 13. The rear ends of these collars 15 and the front ends of the collars 14 are of a circumference to permit of their readily engaging with the elastic washers 12 and, when necessary, passing within the recesses 11 in the respective faces of the thread guiding and tension wheels 6.

17 represents spiral springs encircling the respective shafts 4 and impinging at their rear ends against the front ends of the sliding collars 15, and 18 represents thumb or milled nuts carried by the front threaded ends 19 of the shafts 4, so that by screwing said thumb-nuts 18 inward or rearward the spiral springs 17 will be compressed upon and force the collars 15 against the front elastic washers 12, and also force said wheels 6 rearwardly, so as to bring the rear elastic washers 12 in contact with the rear collars or blocks 14, thereby braking the wheels and, in the same ratio that the wheels 6 are rendered difficult of revolution, increasing the tension on the thread necessary to secure the rotation of said wheels and the feed of the thread. By this construction and arrangement the degree of tension on the thread can at all times and most expeditiously and certainly be adjusted and regulated, as a simple turn in either direction of the thumb-nuts 18 is all that is necessary to secure the proper adjustment of the tension on the thread. By the employment of the elastic washers 12, against which the collars 14 15 impact, not only is the wear of the impacting parts and the binding

friction that would ensue were the collars to impinge directly against the faces of the wheels lessened, but by reason of the elasticity of said washers a more certain and variable tension is secured and easier and smoother rotation of the wheels secured and the adjustment of the tension-regulating devices most readily and effectively obtained to a fraction.

20 represents thumb or milled nuts for locking the thumb or milled nuts 18.

Suitable thread-guiding wheels, as 21, or equivalent devices, are contained within the wax-pot in the usual manner to guide the thread in its passage from the spool through the wax in the pot to its point of exit therefrom. Suitable means, as a gas-flame or a lamp, are employed for the purpose of keeping the wax in a fluid condition; but these being well-known appliances and in customary use such are not specifically shown or described herein.

What we claim is—

The tension device consisting of the fixed supporting-shafts, the tension-wheels, each revoluble on its shaft and having several grooves and provided with recesses 11, the elastic blocks 12, and collars 15, said collars being held against rotation and having transverse dimensions less than that of the recesses and adapted to be pressed therein, and having a spring tending to move the collars to compress the said blocks within the recesses, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK H. HAGADORN.  
MATHEW J. NICOL.

Witnesses:

WM. J. MCPHERSON,  
DONALD GORDON.