

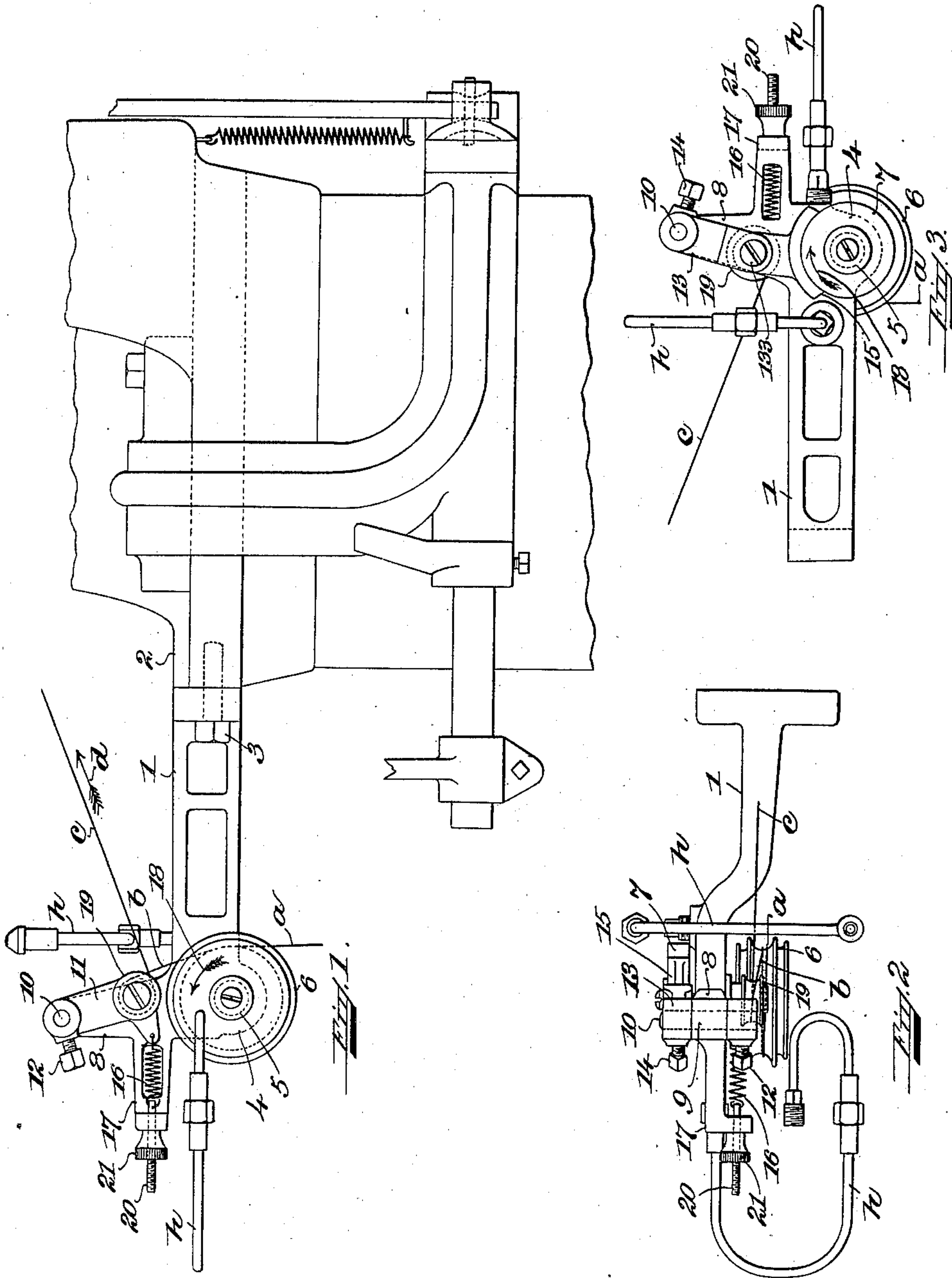
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Patented Nov. 5, 1901.

H. A. WEBSTER.
TENSION DEVICE FOR SEWING MACHINES.

(Application filed Aug. 15, 1899.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

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TENSION DEVICE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 686,012, dated November 5, 1901.

Application filed August 15, 1899. Serial No. 727,265. (No model.)

To all whom it may concern:

Be it known that I, HAROLD A. WEBSTER, a citizen of the United States, residing at Haverhill, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Tension Devices for Sewing-Machines; and I do hereby 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.

The present invention relates to an improvement in tension devices for sewing-machines, and more particularly to an improvement in tension devices of the character described in my copending applications, Serial No. 686,422, filed July 20, 1898, and Serial No. 696,812, filed November 18, 1898, which are especially adapted for use in connection with wax-thread sewing-machines.

The object of the present invention is to make a tension device operating on the same general principle as those of the above-named applications and which shall be especially adapted for use where heavy tensions are employed.

To the above end the present invention consists of the improved tension device hereinafter described and claimed.

In the drawings illustrating the preferred embodiment of my invention, Figure 1 is a side elevation of the device shown attached to the rear of the well-known Goodgear welt and turn machine, of which the upper part of the stand and the lower part of the head are shown. Fig. 2 is a plan, and Fig. 3 is a side elevation of the side opposite that shown in Fig. 1.

In the illustrated embodiment of the invention the frame 1, secured to the rear of the base 2 of the head of the sewing-machine in any desired manner, as by bolts 3, is projected rearwardly and provided with a bearing 4 for the shaft 5, upon which at one end the thread-truck 6 and upon the other end the brake-wheel 7 are secured. An upwardly-extended projection 8 from the rear end of the frame 1 is provided with a bearing 9 for the auxiliary shaft 10, upon the end of which over the thread-truck is mounted an arm 11,

secured to the shaft in any suitable manner, but preferably by means of the set-screw 12, by which means the arm 11 may be adjusted on the shaft 10 and secured thereon in the desired position. A thread-roller 19 is loosely mounted upon the depending arm 11, around which the thread passes from the thread-truck to the stitch-forming devices, as hereinafter described. To the other end of the shaft 10, which is projected over the brake-wheel 7, is secured the knuckle lever or arm 13 in any suitable manner, as by the set-screw 14. A brake-shoe 15, pivotally attached to the lower end of the knuckle lever or arm 13, normally rests upon the surface of the brake-wheel and holds it and the thread-truck from rotation. A coiled spring 16 is attached at one end to the depending arm 11 and at the other end to the rearwardly-projected arm 17 of the frame 1. The pull of the spring is capable of adjustment by means of the threaded rod 20 and the adjusting-nut 21.

It will be observed that the thread passes up from the wax-pot, as at *a*, one or more times around the thread-truck 6 and thence, as shown at *b*, over and one or more times around the thread-roller 19 and thence, as shown at *c*, in the direction of the arrow *d* to the stitch-forming devices and that the direction of rotation of the thread-truck in giving up thread to the stitch-forming devices (indicated by the arrow 18) is such that if the brake-shoe be permitted to fall upon the brake-wheel the latter would be immediately and firmly clamped and held from further rotation, thereby causing the thread-truck positively to hold the thread until the predetermined tension was again reached. This result is secured by locating the knuckle-joint 13 between the knuckle-lever 13 and the brake-shoe on the side toward the advancing surface of the brake-wheel. Thus it follows that when the tension on the thread momentarily falls after an increment thereof is set free by the thread-truck the first effect of the fall of tension will be to permit the spring to straighten the knuckle-joint, and then even if the thread-truck and associated parts had sufficient inertia of motion to tend to give them a further rotational movement

that movement at its very beginning would tend to move the brake-shoe to straighten the knuckle-joint and set the brake with a force much greater than that possible of being exerted by the spring 16. It will also be observed that a pull upon the thread *c* in a direction of the arrow *d* to draw thread from the wax-pot is opposed by the pull of the spring 16 in the opposite direction and that inasmuch as the thread running onto the thread-roller 19 has a direction which is substantially at right angles to the direction of the pull of the thread, as indicated by the arrow *d*, the tension of the thread *b* is almost a negligible quantity in determining precisely the tension at which it is desired the brake mechanism should be released, and therefore that the pull upon the thread necessary to release the brake mechanism is approximately directly proportional to the adjusted tension of the spring 16. Thus it is seen that it is possible very accurately to determine the precise tension at which the brake mechanism will be released and that such tension is very accurately measured by the tension of the spring 16, and, furthermore, that the adjustment of the predetermined tension does not materially or proportionately affect the braking power of the brake mechanism, this result flowing from the use of the knuckle-joint, which when approximately straightened exerts substantially equal pressure, although the force used in straightening the knuckle-joint may vary considerably, and from the further fact that the friction between the brake-shoe and brake-wheel probably is a more important factor in setting the brake after the parts have been brought into contact with each other than the spring.

Heating-pipes *h h*, leading to and from the end of the frame 1, which is hollow, may be provided to maintain the thread-truck and associated parts at the proper temperature to prevent the waxed thread from cooling on its way to the work.

The operation of the machine of the drawings is as follows: During the operation of sewing the stitch-forming instrumentalities at times pull upon the thread to draw thread from the thread-supply to obtain the thread for the next succeeding stitch, pulling the thread from the tension device and wax-pot. When a pull is exerted upon the thread by the stitch-forming devices, the first effect will be to move the thread in the direction of the arrow *d*, and inasmuch as the spring 16 is then holding the brake-shoe 15 against the brake-wheel 7 the thread-truck 6 is held stationary thereby, so that the pull upon the thread will shorten its length between the thread-truck 6 and the stitch-forming devices and draw the third roller 19 in the direction of the arrow *d*, which through the knuckle lever or arm 11, shaft 10, and arm 13 will lift the brake-shoe off of the brake-wheel 7, and thus free the thread-truck 6, which will be

rotated by the pull on the thread exerted by the stitch-forming devices. When the increment of thread is thus given up to the stitch-forming devices, the tension thereon will be momentarily relieved and the thread will at once cease to hold the thread-roller 19 in its forward position, and thus released it will be drawn back by the spring 16 and the brake-shoe reapplied to the brake-wheel, and the thread will then be again held under any tension less than the predetermined tension necessary to withdraw the brake. It is thus observed that the thread is at all times held against all tensions thereon less than a predetermined tension and that only when said predetermined tension is reached will the thread be released and an increment thereof given up to the stitch-forming devices.

While I have herein described and shown the preferred form of my present improvement in tension devices, it is to be understood that my invention is not specifically limited thereto, as it is susceptible of embodiment in various forms without departing from the spirit of the invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent of the United States—

1. In a tension device, the combination with a thread-truck, of a brake member connected therewith, a knuckle-lever carrying another brake member, and mechanism connected with said knuckle-lever actuated by a pull on the thread to open the brake, substantially as described.

2. In a tension device, the combination with a rotatable thread-truck, of a brake-wheel connected thereto and rotatable therewith, a brake-shoe, a knuckle-lever operatively connected therewith, means for actuating the said lever to press the brake-shoe against the brake-wheel, the knuckle-joint between the said lever and the brake-shoe being so located with reference to the brake-shoe that a rotation of the thread-truck in a direction to deliver thread will cause the brake-shoe to be applied to the brake-wheel with increasing force, substantially as described.

3. In a tension device, the combination with a thread-truck, of brake members one of which is connected with the truck, a knuckle-lever carrying the other brake member, a swinging lever, a spring acting on said swinging lever and suitable connections between said knuckle-lever and swinging lever, substantially as described.

4. In a tension device, the combination with a rotatable thread-truck, of brake members one of which is connected with the truck, and mechanism to set the brake when the brake members are in contact actuated by the rotation of the truck in a direction to give up thread, substantially as described.

5. In a tension device, the combination with a thread-truck, of braking mechanism, a knuckle-lever for actuating said braking

mechanism, and means controlled by a pull of the thread for actuating the said lever, substantially as described.

6. In a tension device, the combination with
5 a thread-truck, of a brake-wheel connected thereto, a brake-shoe, a knuckle-lever operatively connected with the brake-shoe and means controlled by a pull of the thread for actuating the said lever, substantially as de-
10 scribed.

7. In a tension device, the combination with

a thread-truck, of braking mechanism, a knuckle-lever for actuating said braking mechanism, and a movable thread-roller and spring connected with the said lever to actu- 15
ate said toggle, substantially as described.

In testimony whereof I affix my signature
in presence of two witnesses.

HAROLD A. WEBSTER.

Witnesses:

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T. HART ANDERSON.