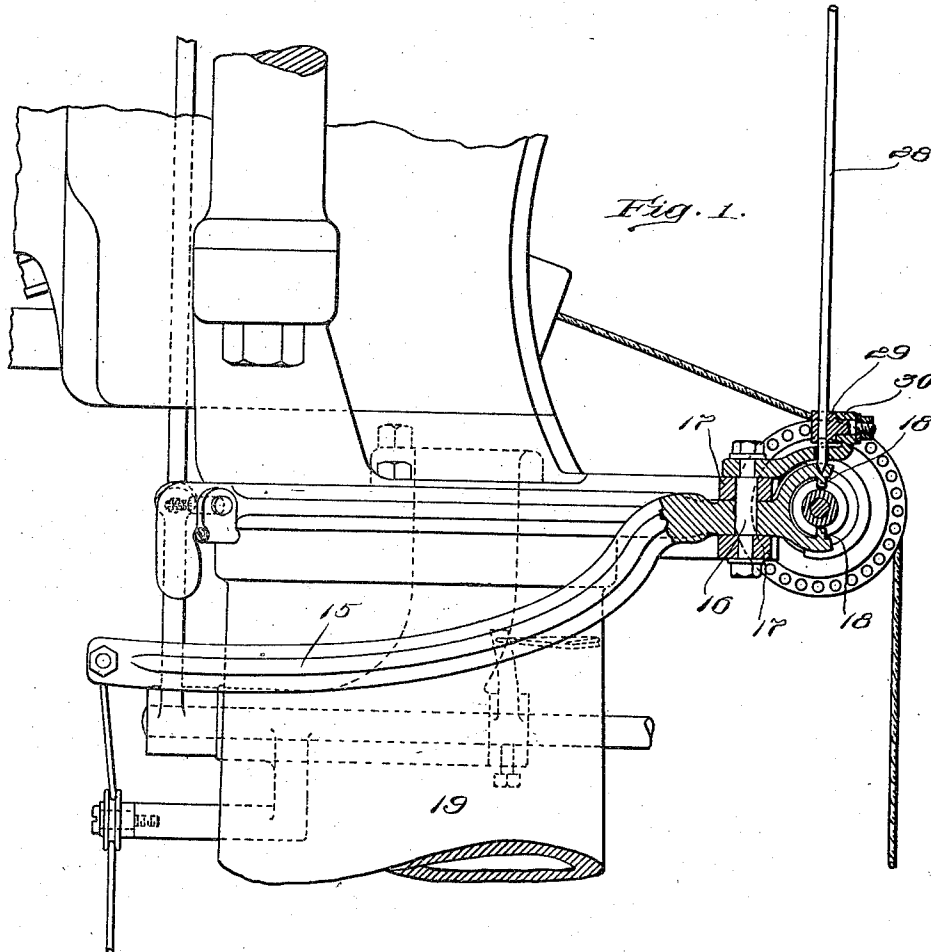


C. P. HOLMES.
SEWING MACHINE.
APPLICATION FILED MAY 22, 1909.

1,030,816.

Patented June 25, 1912.
3 SHEETS—SHEET 1.



Witnesses:
R. A. Simonds.
A. C. Richardson.

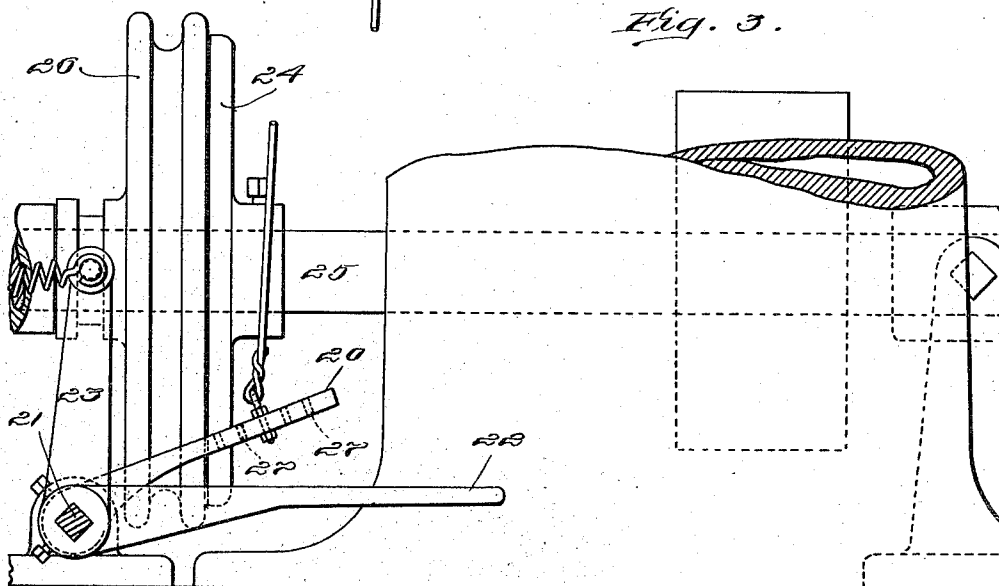
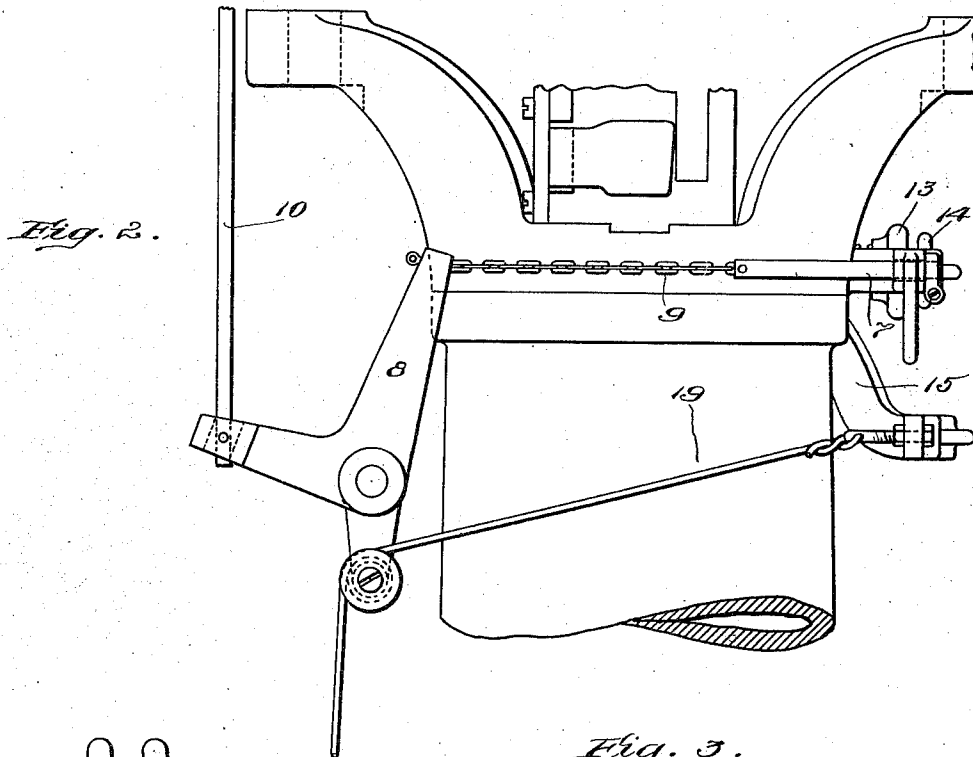
Inventor:
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3 SHEETS-SHEET 2.



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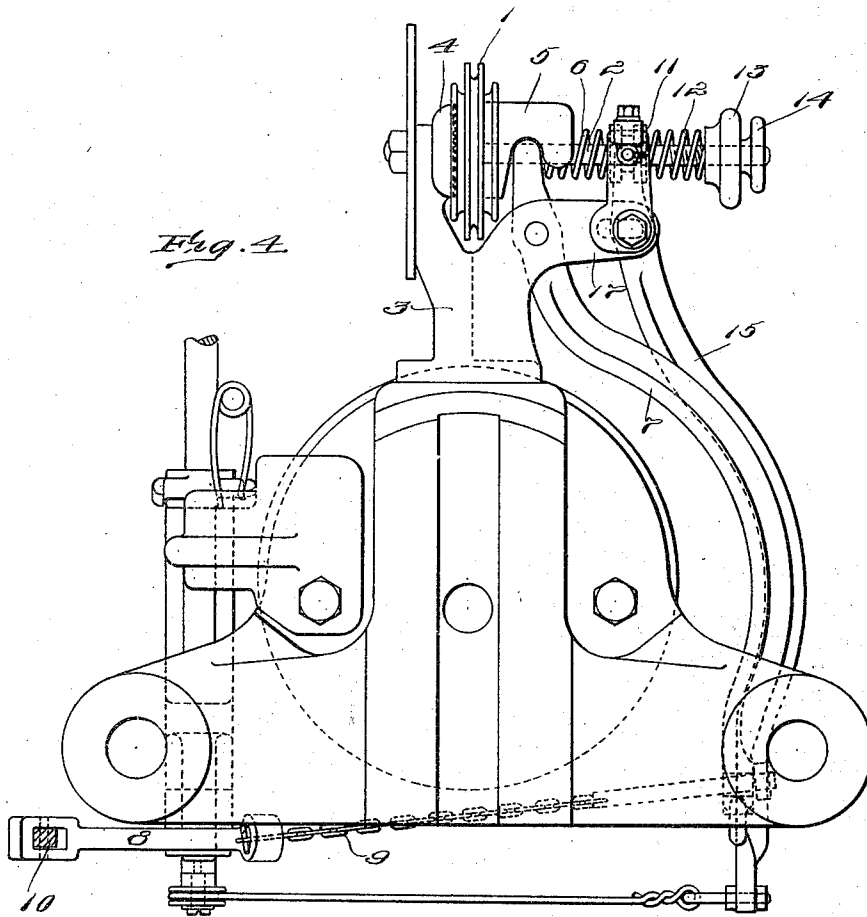
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3 SHEETS-SHEET 3.



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Inventor:

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UNITED STATES PATENT OFFICE.

CHARLES P. HOLMES, OF LYNN, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SEWING-MACHINE.

1,030,816.

Specification of Letters Patent.

Patented June 25, 1912.

Application filed May 22, 1909. Serial No. 497,604.

To all whom it may concern:

Be it known that I, CHARLES P. HOLMES, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in 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 sewing machines.

In sewing machines as at present constructed, the stitch is generally set or drawn to its final condition of tightness against a yielding resistance, the amount of resistance ordinarily determining the degree of tightness of the finished seam. It is often desirable or necessary to vary the speed at which a sewing machine operates on account of variations in the character of the work or the seam which is being sewn, and it has been observed that where the speed of the machine is altered, the tightness of the seam is very apt to be changed. For example, a machine which, at a certain predetermined speed, sews a tight stitch, will often produce a loose seam when the speed is reduced, or will injure or cut out the material between the stitches or break the thread when the speed is increased. These objectionable results are due, it is believed, to the inertia of the parts which offer the yielding resistance to the strain or pull upon the thread and against which the stitch is tightened, an increase in the speed of the machine producing an increased inertia effect similar in its results to an actual increase in the yielding resistance against which the stitch is set, while a reduction in the speed of the machine from the predetermined or normal speed reduces the inertia effect so that the machine operates as if the resistance had been diminished.

The present invention seeks to avoid, so far as possible, the objectionable effects produced by changes in the speed of operation of the sewing machine by compensating, as it were, for the increased inertia effect at higher speeds and decreased inertia effect at lower speeds, than the normal or predetermined speed of the machine, and this result is accomplished, generally speaking, by diminishing in the one case and increasing

in the other, the actual yielding resistance against which the stitch is set.

The present invention is illustrated in the accompanying drawings as embodied in a wax-thread, chain-stitch, shoe sewing machine of the well known Goodyear welt and turn type in which the stitch is set or tightened by a take-up which draws on the thread against the resistance offered by a tension device in the form of a rotatable thread truck or wheel, frictionally held from free rotation. Such a shoe sewing machine is illustrated and described in detail in United States Letters Patent No. 412,704, granted October 8, 1889, upon the application of Zachary T. French and William C. Meyer. Sewing machines of this type are designed to be operated by power, some suitable clutch mechanism being provided under the control of the operator whereby the machine may be connected with the source of power and caused to operate at normal speed or may be disconnected therefrom, and brought to a standstill, or, by a partial release of the clutch so that some slipping will occur, may be operated at a reduced speed.

In the illustrated embodiment of the present invention, which is the preferred form yet devised for use in connection with a shoe sewing machine of the above described type, connections have been provided between the clutch mechanism and the tension device so that a heavier tension or resistance will be imparted to the tension wheel when the clutch is only partially closed and the machine is operating at reduced speed, say around the toe portion of a shoe, than when the clutch is completely closed and the machine is driven at full speed on the ball or shank portions. An indicator has also been provided which will enable the operator to determine at a glance the relative amount of resistance applied to the wheel.

In the accompanying drawings, Figure 1 shows, in side elevation, with certain parts in section, a portion of the head and column of a commercial Goodyear welt and turn shoe sewing machine embodying the present invention; Fig. 2 is a front elevation of the same; Fig. 3 is a front elevation of the bottom of the column with the clutch mechanism; and Fig. 4 is a top plan view of the column with the head removed.

In the specific embodiment of the present

invention the tension wheel, around which the thread passes on its way from the wax pot to the stitch forming instrumentalities, comprises the ordinary grooved thread truck or wheel 1 mounted upon a shaft 2 rigidly secured in a bracket or projection 3 extending rearwardly from the top of the column of the machine. The tension wheel is frictionally clamped between the hub 4 on the bracket and the clamping piece or sleeve 5, washers of felt or other suitable friction material being interposed between the wheel and the hub 4 on one side and the clamping sleeve 5 on the other, a spring 6 surrounding the shaft 2 normally forcing the sleeve to the left in Fig. 4 and holding the friction washers in close contact with the tension wheel.

The machine of the drawings is shown as provided with a tension releasing mechanism to relieve the friction upon the tension wheel 1 to permit its free rotation for facilitating the threading of the machine or the removal of a sewn shoe. Such releasing mechanism comprises a pivoted lever 7, bell crank lever 8, flexible connection 9 and actuating lever 10 arranged as shown in the patent to La Chapelle, No. 488,505, dated December 20th, 1892. In this patent and in the commercial Goodyear welt and turn machine, a normally fixed abutment is provided for the right-hand end of the tension spring, the compression of the spring and consequently the resistance imparted to the wheel, thereby, remaining unchanged during the operation of the machine and irrespective of the speed thereof. In the specific embodiment of the present invention illustrated in the drawings, a movable abutment has been provided in the form of the grooved sleeve 11, freely movable along the shaft 2 and normally pressed toward the left in Fig. 4 by the spring 12, one end of which engages the adjusting nut 13 on the shaft held in fixed position by the check nut 14.

Normally, that is, when the clutch is closed and the machine is operating at full speed, the sleeve 11 will be moved toward the right in Fig. 4 compressing the spring 12 and correspondingly relieving the compression of tension spring 6, the frictional resistance to rotation of the tension wheel 1 still being sufficient to produce a tight seam. When, however, the speed of the machine is reduced by a slipping of the clutch, the sleeve will be permitted to move toward the left in Fig. 4 under the action of spring 12, thereby increasing the compression of tension spring 6 and the frictional resistance exerted upon tension wheel 1, and compensating for the diminution of inertia resistance, thus enabling the machine still to sew a tight seam although operating at a reduced speed.

The means for shifting the sleeve 11 upon the shaft 2 comprise a lever 15 pivoted upon the stud 16 adjustably mounted in the slotted arms 17 of the bracket or projection 3, the shorter arm of the lever being forked, as shown in Fig. 1, and provided with shifting pins or projections 18 entering the groove in the sleeve 11. The front end of the lever 15 is connected by means of a wire 19 or other suitable form of connection with an arm 20 fixed upon the treadle shaft 21 of the clutch mechanism. This shaft also carries the treadle 22 and the shipping lever 23 by means of which the constantly rotating driving member 24 fixedly secured upon the constantly running countershaft 25, is brought into engagement with the grooved clutch member 26 connected by suitable pulley and belt connection (not shown) with the main shaft of the sewing machine.

The arm 20 on the treadle shaft is provided with a plurality of holes 27 in one or another of which the lower end of the flexible connection 19 may be secured, thus enabling the operator to adjust the movement of the lever 15 and sleeve 11 so that it may be greater or less in extent.

It is obvious from the above description of the parts that when the clutch is tightly closed the amount of the frictional resistance imparted to the tension wheel by the spring will be less than when the clutch is allowed to slip, and by adjusting the nut 13 on the shaft and the various connections of the actuating mechanism for the sleeve 11, any desired resistance may be imparted to the wheel at reduced speed as well as at full speed of the machine.

In order to enable the operator at a glance to tell the relative amount of resistance on the wheel particularly following a movement of the clutch treadle, an indicator has been provided in the form of the rod 28 mounted in the stud 29 pivoted to turn about a horizontal axis in the bracket or arm 30 adjustably mounted upon the stud 16, the lower end of the rod 28 entering a recess in the upper fork of the lever 15. Upon movement of this lever to the right or to the left in Fig. 4, the indicating rod 28 will be tipped to the left or to the right, the extent of movement of the rod indicating to the operator the relative amount of increase or decrease of the tension.

While the present invention is designed especially for machines in which the stitch is tightened or set against a yielding resistance, still it is obvious to those skilled in the art that the mechanism shown and described may be employed to advantage in other types of sewing machines. For example, in lock-stitch shoe-sewing machines, the position of the lock below the surface of the work is determined by the amount of thread drawn off through the tension device

by the pull-off mechanism, and it is evident that variations in the speed of operation of the machine may, on account of the inertia effects, cause variations in the amount of thread so measured off, which variations could be avoided to a substantial degree by the mechanism, or some suitable modification thereof, shown and described herein.

Having thus described the present invention, what is claimed as new is:

1. In a sewing machine, the combination with means offering a yielding resistance against which the stitch is set, of mechanism for varying said resistance when the speed of operation is varied during the continued operation of the machine in sewing a seam.

2. In a sewing machine, the combination with means offering a yielding resistance against which the stitch is set, of mechanism for increasing such resistance when the speed of the machine is reduced during the continued operation of the machine in sewing a seam.

3. In a sewing machine, the combination with a tension wheel of a friction device for retarding the rotation of said wheel, and mechanism operating to increase the resistance offered by the friction device when the speed of the machine is reduced during the continued operation of the machine in sewing a seam.

4. In a sewing machine, the combination with a tension wheel of a friction surface in engagement with said wheel, a spring for holding said friction surface in engagement with the wheel, an abutment for the spring, and means for moving the abutment when the speed of the machine is varied during the continued operation of the machine in sewing a seam.

5. In a sewing machine, the combination with means for imparting a yielding resistance to the thread, of mechanism for varying said resistance when the speed of the machine is varied, and an indicator to show the variations in the amount of resistance.

6. In a sewing machine, the combination with a tension device of a constantly rotat-

ing driving member, a clutch under the control of the operator for connecting the machine to the driving member, and connections between the clutch and the tension device to increase the tension when the clutch is allowed to slip.

7. In a sewing machine, the combination with a tension device of a constantly rotating driving member, a clutch under the control of the operator, connections between the clutch and the tension device for increasing the tension when the speed of the machine is reduced, and means for varying the amount of such increase.

8. In a sewing machine, the combination with a tension wheel mounted upon a fixed stud, a friction member longitudinally movable along the stud, a spring engaging at one end the member, a movable sleeve engaging at one side the other end of the spring, a second spring, one end of which engages the other side of the sleeve, an adjusting nut for the other end of the spring, a pivoted lever for actuating the sleeve, an adjustable pivot for the lever, and means for automatically swinging the lever upon its pivot when the speed of the machine is varied, substantially as described.

9. In a sewing machine the combination with a thread tension device, of mechanism under the control of the operator for varying the speed of operation of the machine and connections between said mechanism and the tension device acting to vary the tension on the thread when the speed of operation is varied.

10. In a sewing machine the combination with a thread tension device, of means under the control of the operator for varying the speed of operation of the machine and simultaneously actuating the tension device to vary the tension on the thread.

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

CHARLES P. HOLMES.

Witnesses:

WARREN G. OGDEN,
FRED O. FISH.