No. 857,540.

PATENTED JUNE 18, 1907.

F. W. ROBINSON.

MACHINE FOR CUTTING RIBBED FABRICS.

APPLICATION FILED SEPT. 1, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

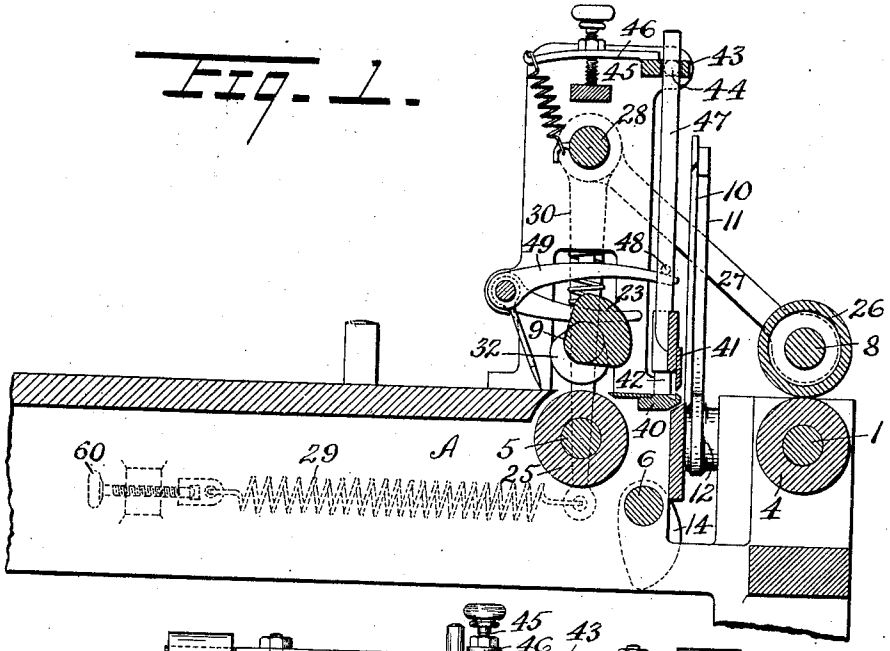
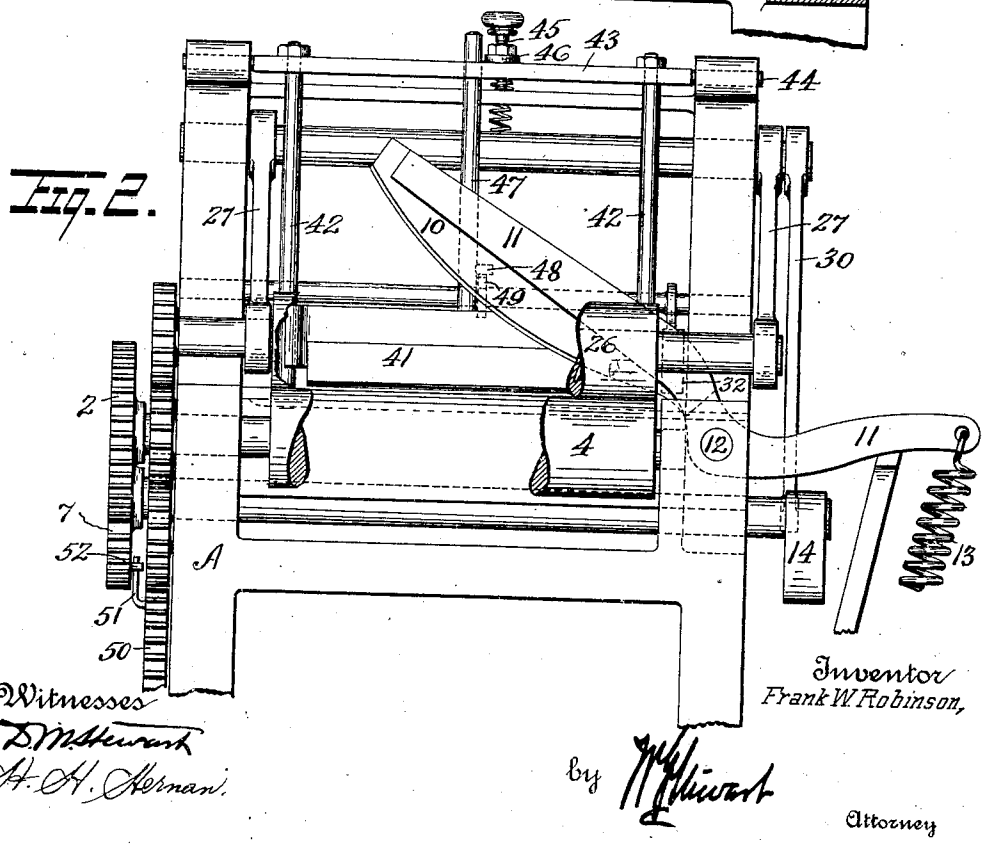


Fig. 2.



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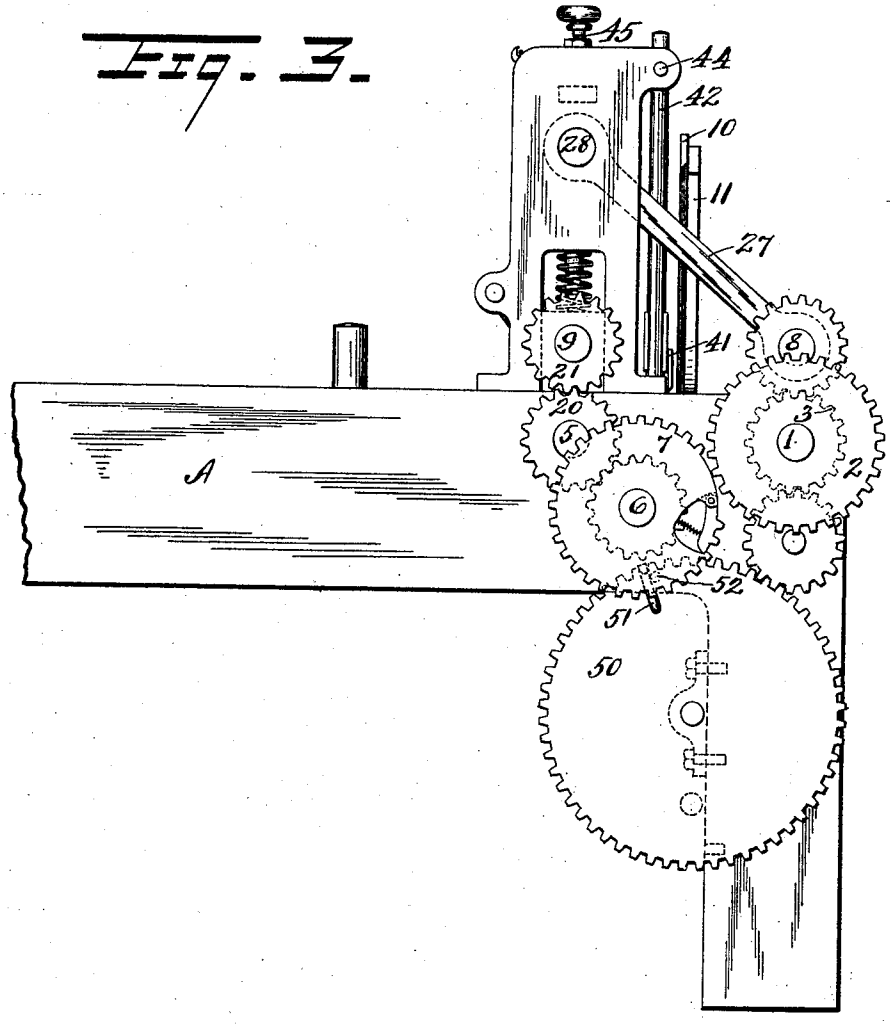
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2 SHEETS—SHEET 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR CUTTING RIBBED FABRICS.

No. 857,540. Specification of Letters Patent. Patented June 18, 1907.

Application filed September 1, 1906. Serial No. 332,992.

To all whom it may concern:

Be it known that I, FRANK W. ROBINSON, a citizen of the United States, and a resident of the city of Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Cutting Ribbed Fabrics, of which the following is a specification.

My invention relates to machines for automatically cutting ribbed fabrics, such as stocking tops or legs formed in connected series; and more particularly to improvements in the class of machines shown in Patent No. 751,560, issued to me February 9th, 1904.

In the prior patent referred to, separate feed mechanisms were employed, located respectively in advance of, and to the rear of the cutting mechanism, in connection with a rib-engaging device having a limited movement with each ribbed portion of the fabric and adapted by such movement to control the actions of the feed and cutting mechanisms as required by varying lengths of tops. In my present improvements I dispense with such rib-operated controlling means and operate the intermittently acting parts at regular intervals while at the same time providing for accurately cutting each top closely adjacent to its rib or welt notwithstanding variations in length.

The invention is fully described in connection with the accompanying drawings and the novel features are specifically pointed out in the claims.

Figure 1 is a sectional elevation of a portion of a machine embodying my invention in preferred form. Fig. 2 is a front elevation of the same, portions being broken away to more clearly show other parts. Fig. 3 is a full side elevation of the front portion of the machine, showing particularly the gearing together of the operating shafts.

The general features of the machine shown, are similar to those of my prior patent; 1 representing the main driving shaft, mounted in bearings on the table A and having gear wheels 2 and 3 and the lower forward feed roll 4 fixed thereto, and 5 representing the lower roll shaft of the rear feed mechanism arranged in gear with an intermediate shaft 6 having a gear 7 adapted to mesh with said gear wheel 2 on shaft 1, while the respective upper feed shafts 8 and 9 are in gear with the corresponding lower shafts, all as indicated in Fig. 3.

The shaft 6, in the preferred construction shown, is not continuously driven by the gear 2 on shaft 1, provision being made for operating the forward feed rolls a longer or shorter time as required for decidedly different lengths of tops, by making the gear 7 on shaft 6 a mutilated gear as in my prior patent, and throwing the same into operative connection with gear 2 at desired intervals as determined by a pattern wheel 50 arranged in gear with drive shaft 1 and having a tooth 51 adapted to engage a pin 52 on the mutilated gear so as to carry it past the mutilation and secure its rotation by the gear 2. Thus by changing the size of pattern wheel the length of feed provided for, preliminary to regularly throwing the other parts into operation, may be properly adapted to either long or short tops, as for women's or men's stockings.

The movable shear-blade 10, fixed to arm 11 pivoted at 12, is normally held raised by a spring 13 and is positively depressed by a cam 14 on shaft 6 at each rotation of the latter. The feed shafts 5 and 9 are also rotated once for each rotation of the shaft 6, through gears 20 and 21, thus bringing into action in properly timed succession with each movement of the shearing device, first the rib-engaging device 40—41 as hereafter described, and second the intermittent feeding action of the quadrant roll 23 on said shaft 9; these three movements being effected by the drive gear 2 at regular intervals as determined by the pattern gear employed. The main feeding action upon the fabrics, it will be seen, is produced by the forward feed rolls 4 and 26 on shafts 1 and 8 respectively, said rolls being geared together as shown and continuously rotated with a regulated feed pressure upon the fabric as hereafter described.

The upper feed roll 26 is carried by a swinging arm 27 on a shaft 28, and bears upon the lower roll 4 with a pressure which is properly regulated by an adjustable spring 29 attached, as indicated, to a branch arm 30, and the tension of which is regulated, as indicated, by a suitable adjusting screw 60. The feed pressure thus secured, is readily regulated so as to insure a regular normal feed or pulling forward of the fabric, excepting when the movement of the latter

is detained by the contact of a rib or welt thereon with the lowered rib-engaging device 40—41 previously referred to, which occurs preliminary to effecting a cut. This cutting action being arranged to occur at regular intervals, as hereafter more particularly described, the feed rolls 4 and 26 are so speeded as to tend to feed forward a length of fabric somewhat in excess of the length of the individual stocking tops of the series, so that in each case the approaching rib or welt which marks the beginning of a new top, will be drawn tightly against the lowered rib-engaging device 40—41 so as to practically square it therewith and insure a parallel cut; and, the excess feeding action being sufficient to secure this squaring-up of the rib even in case of the longest tops of the series, (the lengths of which are not uniform), the regulated feed pressure upon the rolls is adapted to permit of slippage upon the fabric while the latter is being momentarily detained by the rib-engaging device and during the cutting operation. By this means I am enabled to accurately cut varying lengths of tops, while at the same time regularly operating the shearing device and the coöperating rib-engaging device and rear feed mechanism.

The rib-engaging mechanism, as shown, comprises a bottom plate 40 over which the fabric passes, and a vertically movable rib-engaging stop plate 41 the lower edge of which, when depressed, coöperates with said bottom plate to prevent the passing of a rib or welt drawn against it by the forward feed mechanism just described. The rib-engaging plates 40 and 41 are preferably set as near to the shearing device as practicable for different grades of material, and to this end the bottom plate 40, as shown, is carried by vertical rods 42 fixed to a top bar 43 which is pivoted to the frame of the machine at 44 so that the plate 40 may be accurately set to desired position by means of an adjusting screw 45 engaging an arm 46 of said top bar 43; while the movable rib-engaging plate 41 is carried therewith and vertically guided upon said rods 42 and by a central carrier-rod 47 guided in said top bar 43. This carrier-rod is provided with a pin 48 which bears upon a lever 49 pivoted to the machine frame; and it is successively lowered and lifted at proper times to respectively detain and release the fabric, by means of a cam 32 on the shaft 9 arranged to operate said lever 49.

The connected tops are drawn forward upon the table A between suitable side-guides, and over the rear bottom roll 25, the bottom rib-engaging plate 40, and the lower shearing blade, by the continuously operated forward feed rolls arranged to exert a regulated feed-pressure upon the fabric as described. The number of revolutions of these feed rolls required for feeding tops of approximately a given length is provided for by employing a pattern wheel 50 of corresponding size, which wheel merely determines the fixed interval elapsing in such case between the regular operations of the other parts of the machine; the machine thereafter operating the same as though it were adapted exclusively for such class of tops, the shaft 6, because of the mutilated gear 7, being merely allowed to rest a fixed time while the normal feeding of the fabric goes on. After such fixed interval of feed, the mutilated gear is thrown into action about the time a rib or welt comes into contact with the lowered rib-engaging stop-plate 41; while the forward feed mechanism continues its regulated pulling action upon the fabric, against the stop-plate 41, the shearing blade 10 is depressed by the cam 14 to sever the stretched fabric just forward of said rib-engaging stop; the continued action of the forward feed-rolls after contact of the rib with said stop-plate merely serving to properly square-up the rib against the latter and thereafter becoming ineffective through slippage of the rolls upon the detained fabric owing to the limited regulated pressure thereon, such slippage taking place only to a sufficient extent to provide for the comparatively slight difference in the lengths of the tops which would otherwise prevent the cutting of them uniformly close to the rib as is essential to satisfactory work. As soon as the cutting operation is effected, the rib-engaging stop-plate 41 is raised by the cam 32 and lever 49, and the rear feed rolls 25 and 23 push forward the ribbed end of the fabric into engagement with the continuously operating forward feed rolls for a repetition of the described operation upon the succeeding top.

Having thus fully described my invention I do not desire to limit myself to the specific mechanism particularly described for carrying it into effect, but:

What I claim is:—

1. A machine for cutting connectedly-formed stocking legs having transverse ribs, to lengths determined by the spacing of the ribs, comprising a regularly reciprocated shearing device, a fabric-detaining device or stop arranged to engage each rib during a cutting operation, and feed rolls arranged to stretch the portion of the fabric operated upon by the cutting device, substantially as set forth.

2. A machine for cutting connectedly-formed stocking legs having transverse ribs, to lengths determined by the spacing of the ribs, comprising a regularly reciprocated shearing device, continuously acting feed rolls in advance of said shearing device and a rib-engaging and disengaging stop located to the rear of said shearing device and arranged to detain the fabric against the stretching

action of said feed-rolls during the shearing operation.

3. A machine for cutting connectedly-formed stocking legs having transverse ribs, to lengths determined by the spacing of the ribs, comprising a regularly reciprocated shearing device, continuously acting feed-rolls in advance of said shearing device, a rib-engaging and disengaging stop located to the rear of said shearing device and arranged to detain the fabric against the continued action of said feed rolls during the shearing operation, and means for regulating the feed-pressure of said continuously acting rolls so as to vary the stretching effect upon the fabric.

4. A machine for cutting connectedly-formed stocking legs having transverse ribs, to lengths determined by the spacing of the ribs, comprising a regularly reciprocated shearing device, continuously acting feed-rolls in advance of said shearing device, a rib-engaging and disengaging stop located to the rear of said shearing device and arranged to detain the fabric against the continued action of said feed rolls during the shearing operation, and intermittently acting auxiliary feed mechanism to the rear of said shearing device.

5. A machine for cutting connectedly-formed stocking legs having transverse ribs, to lengths determined by the spacing of the ribs, comprising a regularly reciprocated shearing device, continuously acting feed-rolls in advance of said shearing device, a rib-engaging stop located to the rear of said shearing device and arranged to detain the fabric against the continued action of said feed-rolls during the shearing operation and thereafter release the same, and auxiliary feed mechanism to the rear of said shearing device arranged to temporarily operate upon the fabric after it is released from said rib-engaging stop.

6. In a machine for cutting ribbed fabrics having a shearing device, means for operating the same at regular intervals, and a continuously acting feed mechanism in advance and an intermittently acting feed mechanism to the rear of said shearing device, a rib-engaging stop mechanism for the fabric located to the rear of said shearing device and comprising a bottom support for the latter, a coöperating rib-engaging device, and means for moving said device at regular intervals into and out of the path of the ribbed portions of the passing fabric.

7. In a machine for cutting ribbed fabrics having a shearing device, means for operating the same at regular intervals, and a continuously acting feed mechanism in advance and an intermittently acting feed mechanism to the rear of said shearing device, a rib-engaging stop mechanism for the fabric comprising a horizontally adjustable bottom support for the fabric, a coöperating rib-engaging device carried by said bottom support, and means for vertically moving said device at regular intervals into and out of the path of the ribbed portions of the passing fabric.

8. A machine for cutting ribbed fabrics comprising a shearing device, continuously acting feed rolls in advance thereof having a regulated feed-pressure as desired, an intermittently acting feed mechanism to the rear thereof, a horizontally fixed and vertically movable rib-engaging fabric-stop located adjacent said shearing device, and means for coöperatively moving said shearing device, intermittent feed mechanism, and rib-engaging fabric stop at regular feed intervals, substantially as set forth.

9. A machine for cutting ribbed fabrics comprising a shearing device, continuously acting feed rolls in advance thereof having a regulated feed-pressure as desired, an intermittently acting feed mechanism to the rear thereof, a horizontally fixed and vertically movable rib-engaging fabric-stop located adjacent said shearing device, means for coöperatively moving said shearing device, intermittent feed mechanism and rib-engaging fabric-stop at regular feed intervals, and means for varying such feed intervals, substantially as set forth.

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

FRANK W. ROBINSON.

Witnesses:
D. M. STEWART,
W. G. STEWART.