A. S. VOSE.

SHOE TRIMMING MACHINE.

APPLICATION FILED MAY 14, 1909.

942,987.

Patented Dec. 14, 1909.

3 SHEETS—SHEET 1.

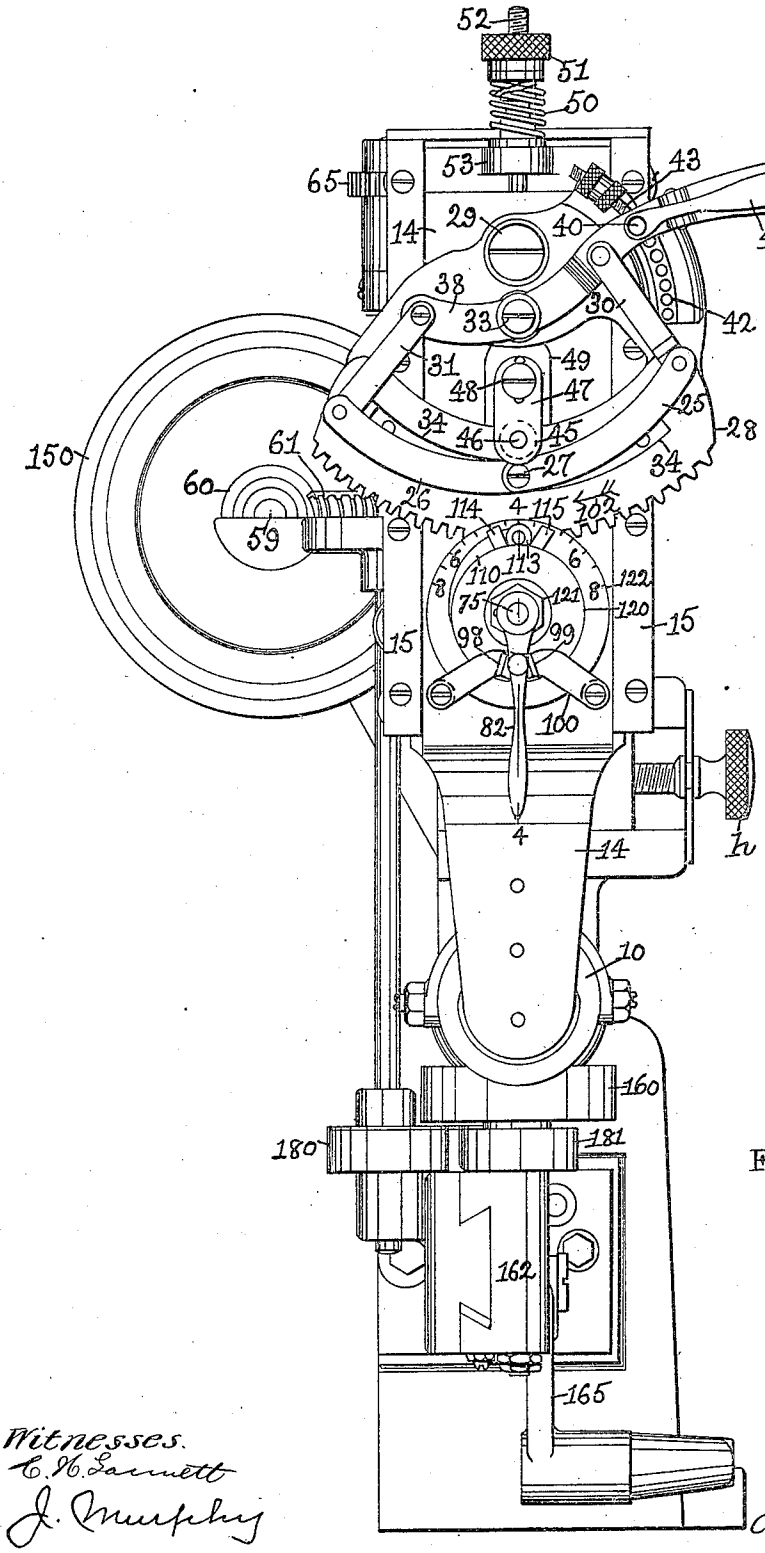

Fig. 1.

Witnesses.
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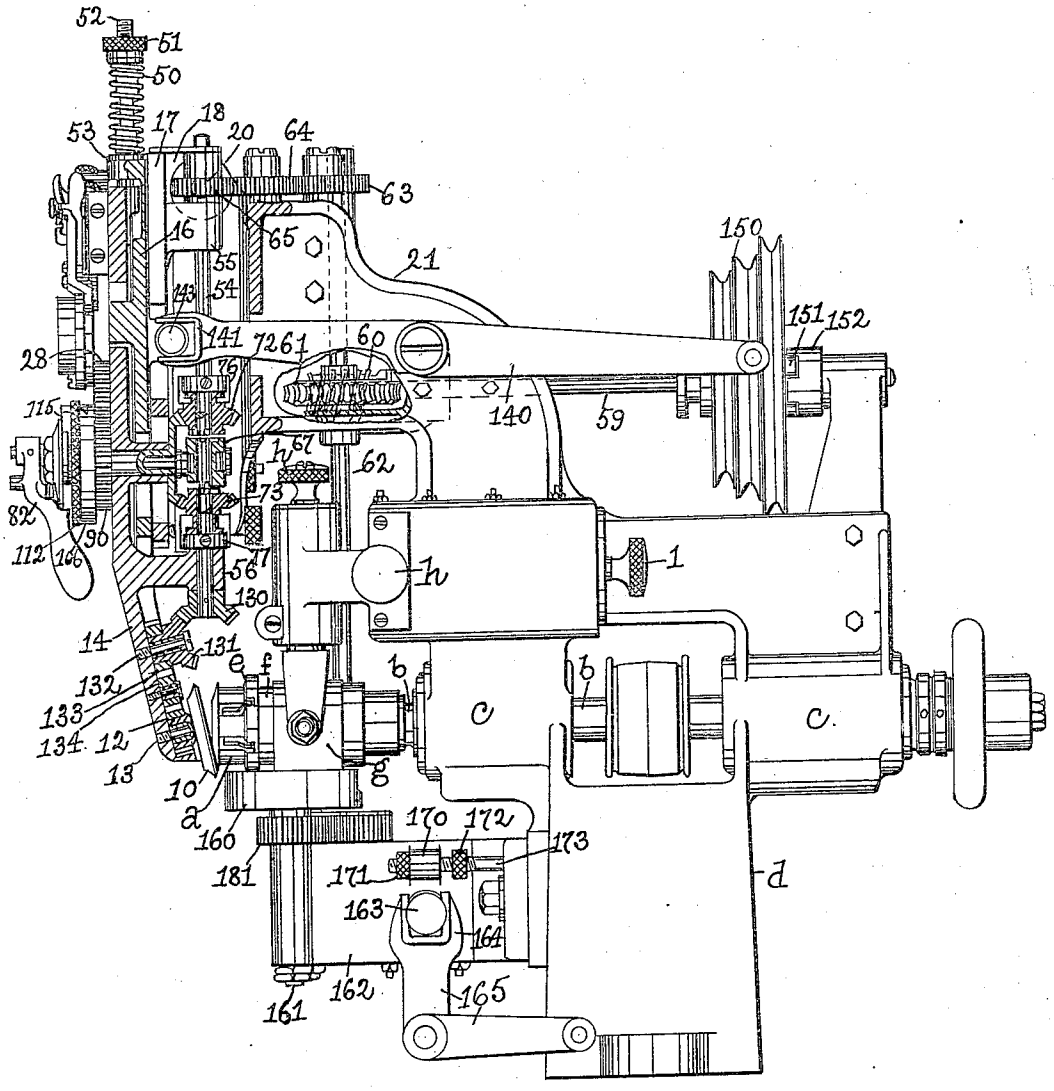

Fig. 2.

Witnesses.
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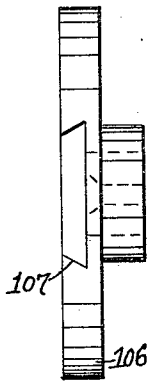

Fig. 5.

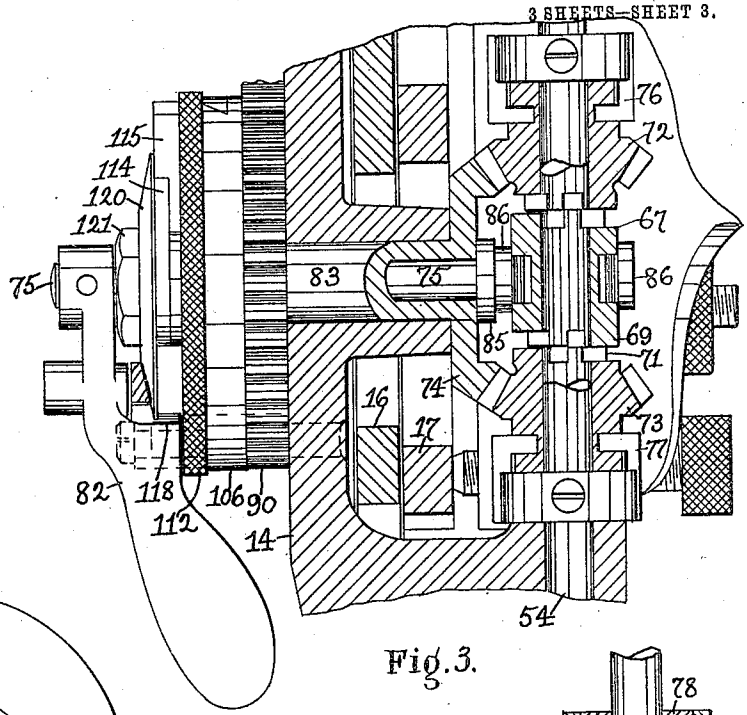

Fig. 3.

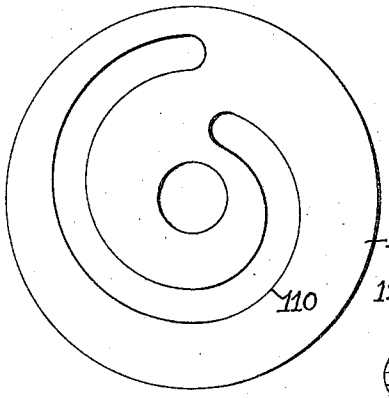

Fig. 7.

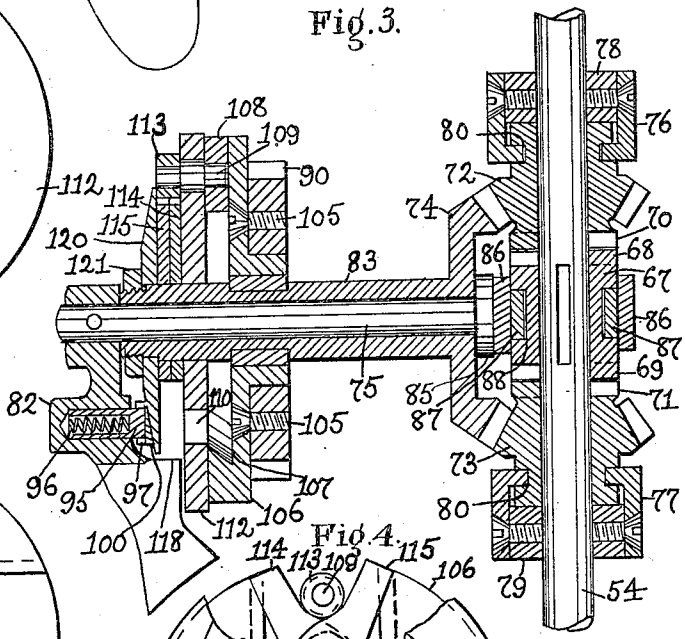

Fig. 4.

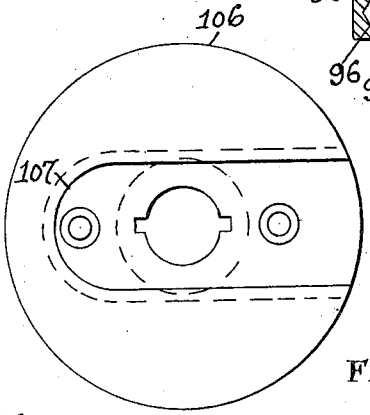

Fig. 6.

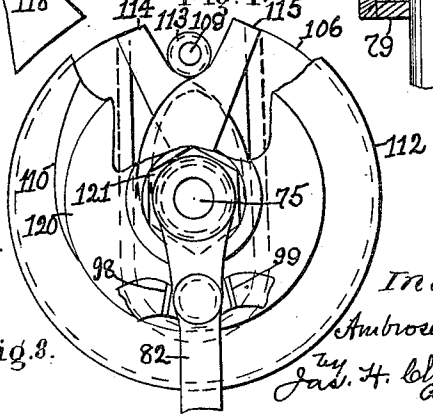

Fig. 8.

Witnesses.
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UNITED STATES PATENT OFFICE.

AMBROSE S. VOSE, OF BROOKLINE, MASSACHUSETTS, ASSIGNOR TO RUTH L. VOSE, OF BROOKLINE, MASSACHUSETTS.

SHOE-TRIMMING MACHINE.

942,987. Specification of Letters Patent. Patented Dec. 14, 1909.

Application filed May 14, 1909. Serial No. 495,877.

To all whom it may concern:

Be it known that I, AMBROSE S. VOSE, a citizen of the United States, residing in Brookline, county of Norfolk, and State of Massachusetts, have invented an Improvement in Shoe-Trimming Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to a machine for trimming the edges of the soles and heels of boots and shoes, and is an improvement upon machines of the character shown and described in U. S. Patent 883,684 dated April 7, 1908, wherein a rotatable guard is bodily moved with relation to a rotary cutter by a movable pattern so as to vary the shape of the outer sole according to the style or shape of the sole desired.

The present invention has for one of its objects to provide simple and efficient means for effecting movement of the pattern in opposite directions, and for automatically stopping the movement of the pattern after it has accomplished its work. Provision is also made for moving the guard away from the rotary cutter to enable the latter to be put on and removed from its shaft in a substantially short time. Provision is also made for manually moving the rotary guard with relation to the rotary cutter and independently of the pattern, to enable the shank portion of the outer sole to be cut, as will be described. Provision is also made for feeding the work by a novel feed mechanism as will be described. These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a front elevation of a sufficient portion of a machine embodying this invention to enable it to be understood. Fig. 2, a side elevation with parts in section of the machine shown in Fig. 1. Fig. 3, an enlarged detail in section and elevation to be referred to. Fig. 4, an enlarged sectional detail on the line 4—4, Fig. 1. Figs. 5, 6, 7 and 8, details to be referred to.

Referring to the drawing, *a* represents a rotary cutter fast on a shaft *b* mounted in bearings *c* in a supporting frame *d*, and *e* represents a bed attached to a sleeve *f* rotatable in a bearing hub *g*, which is capable of radial and longitudinal movements with relation to the shaft *h* by the thumb-screws *h*, *i*, substantially as shown and described in the patent referred to.

The rotary cutter *a* has coöperating with it a rotatable guard 10, fast to a pinion 12 mounted on a shaft 13 supported by a sliding plate or frame 14, which is arranged to slide in guideways formed by the side pieces 15 attached to a supporting plate 16, which in turn is mounted to slide on a plate 17, which latter under normal conditions is practically stationary and forms part of the framework of the machine. The plate 17 is provided at its upper end on its rear side with ears 18, which are pivotally connected at 20 (see Fig. 2) to an upright arm 21 forming part of the supporting frame *d*. The plate 17 is capable of being turned on its pivot 20, so as to move the lower part carrying the rotary guard 10 away from the end of the shaft *b* and the rotary cutter *a* thereon, so as to afford ample room for the rotary cutter to be put on and removed from its shaft, and also to adjust the guard 10 axially with relation to the cutter *a*.

The slide plate 16 under normal conditions is stationary and the slide plate 14, which may be designated the guard-carrying plate, is movable on the stationary plate 16. The guard-carrying plate 14 is moved in one direction to vary the position of the guard 10 with relation to the rotary cutter *a* by one or more patterns, herein shown as two, 25, 26, which are mounted at one end on the pivot pin 27 secured to a segmental gear 28 mounted on a shaft 29 carried by the plate 14, said patterns having their opposite or free ends joined by links 30, 31, to a lever 38 on opposite sides of the pivot 33 therefor, which is secured to the gear 28. The patterns 25, 26, are capable of being adjusted with relation to a fixed pattern 34 fast to the segmental gear 28, by the operator turning the lever 38 on its pivot, and said movable patterns may be locked in their adjusted positions by a pin or stud 40 carried by a finger lever 41 and adapted to enter one of a series of holes 42 in the segmental gear, the finger lever being pivoted to the pattern operating lever 38. The gear 28 carries a set screw 43, which coöperates with and forms a stop for the lever 38 to limit its movement in one direction.

The movable and fixed patterns 25, 26, 34 coöperate with a roller 45 on a stud 46, carried by an arm 47 on a stud or pin 48, ex-

tended through a vertical slot 49 in the guard carrying plate 14 and secured to the plate 16. The patterns 25, 26, 34 are held up in engagement with the roller 45 by a spring 50 interposed between a nut 51 on a threaded rod 52 and a lug 53 on the plate 16, through which the rod 52 is loosely extended and secured to the guard-carrying plate 14.

The patterns 25, 26, govern the position of the guard with relation to the rotary cutter, so as to produce the wide outer sole on the right or left shoe.

As herein represented, the patterns engage the roller 45 at their inner ends substantially in line with the pivot 27, and provision is made for rotating the segmental gear 28 to the left or right according to whether the right or left shoe is being trimmed or acted upon, and for effecting this rotation of the gear 28 from a shaft 54 which is designed to be in continuous rotation.

The shaft 54 is supported in bearings 55, 56, attached to the stationary plate or frame 17 and the movable plate 14, and is driven from a shaft 59 which is designed to be continuously driven while the machine is in operation.

The shaft 59 is provided as shown with a worm 60 (see Fig. 2), which meshes with and drives a worm gear 61 on a vertical shaft 62, supported by the framework and having on it at its upper end a gear 63, which meshes with a gear 64, which in turn meshes with and drives a gear 65 mounted on the shaft 54 so as to rotate therewith and yet permit longitudinal movement of the shaft 54 for a purpose as will be described.

The shaft 54 may be designated the driving shaft for the segmental gear 28 and is provided with a clutch member 67, splined thereon to rotate therewith and to move longitudinally thereon (see Figs. 3 and 4).

The clutch member 67 is shown as a sleeve having teeth or projections 68, 69, at its opposite ends which coöperate with teeth or projections 70, 71, on bevel gears 72, 73, loosely mounted on the shaft 54 and both engaged with a bevel gear 74 on a shaft 75. The bevel gears 72, 73, are supported by yokes 76, 77 secured to collars 78, 79, fast on the shaft 54, said yokes having fingers which enter grooves 80 in the hubs of the gears 72, 73 (see Figs. 3 and 4). The clutch member 67 is normally disengaged from the bevel gears 72, 73, but is adapted to be engaged therewith by means of a handle 82 fast on the shaft 75, extended through the hub 83 of the gear 74 and provided at its end with a crank 85 connected with a yoke 86 having studs 87, which engage an annular groove 88 in the clutch member 67.

The hub 83 of the bevel gear 74 forms a hollow shaft and is extended through and supported by the guard carrying plate 14, (see Figs. 2 and 3), and has fast on it in front of the said plate, a gear 90 which meshes with the segmental gear 28, whereby rotation of the segmental gear in one direction is effected by the engagement of the clutch member 67 with one bevel gear 72, and in the other direction by the engagement of the clutch member with the other bevel gear 73.

Provision is made for holding the clutch member 67 in engagement with either of its coöperating gears until the pattern 25 or 26 has been moved the desired distance to effect the particular shape of the sole desired, and when this is accomplished to automatically disengage the clutch member from the gear with which it is engaged and return it to its central position, from which it is moved by the operator into engagement with the other bevel gear to effect the return movement of the pattern.

The clutch-operating shaft 75 is provided with the handle 82 carrying a dog 95, which is normally pressed forward by a spring 96 (see Fig. 4) into one of three notches or teeth 97, 98, 99, in a stationary cross bar 100 attached to the plate 14.

The front face of the dog 95 and the teeth 97, 98, 99 are suitably shaped so as to hold the handle 82 stationary, while at the same time permitting the ready disengagement of the dog from the teeth or notches by a blow struck upon the handle.

When the dog 95 is engaged with the central notch 97 in the cross bar 100, the clutch member 67 is in its central position. When the handle 82 is turned to the right (viewing Fig. 1), and engaged with the tooth 99, the clutch member 67 is engaged with one of the bevel gears, as for instance the gear 72, and as a result the segmental gear 28 is rotated in the direction of the arrow 102, Fig. 1, so as to bring the pattern 25 into operation, and when the handle is turned to the left and the dog 95 is engaged with the notch 98, the clutch member is locked in engagement with the other bevel gear 73, with the result that, the segmental gear 28 is rotated in the reverse direction to move the pattern 25 into inoperative relation to the roller 45.

Provision is made for controlling the rotation of the segmental gear according to the particular kind or size of shoe being trimmed or cut by the rotary cutter, and for this purpose, the gear 90 has fastened to it as by the screws 105 a disk 106 having a dove-tailed radial slot 107 (see Fig. 6), which is shown as extended from the periphery of the disk beyond the center, and in which moves a dove-tailed slide or block 108 carrying a stud or pin 109, which is extended through a cam slot 110 in a disk 112 mounted on the hollow shaft 83.

The stud or pin 109 projects through the

cam disk 112 and is provided with a roller 113, which extends between and is adapted to enter two arms or levers 114, 115, mounted to turn on the shaft 83 and suitably shaped to be separated by radial movement of the roller 113 and its stud or pin 109, so as to position the ends of the said arms or levers, which may be designated the clutch disengaging arms, with relation to a projecting portion 118 of the handle 82, which extends into the path of movement of the arms 114, 115, so that when the gear 90 is rotated in one direction, one of the arms as 114 is engaged with the handle 82 and the latter is disengaged from the notch 98 and engaged with the central notch 97, and when the gear 90 is rotated in the opposite direction the other arm 115 strikes the handle and disengages it from the notch 99 and engages it with the central notch 97. The arms 114, 115 may be held on the shaft 83 by a disk 120 and nut 121. The cam disk may be provided with graduations or numbers 122 indicative of different sizes of shoes, with which the arms register. For instance, if the operator is about to work on a Number 8 shoe, the cam disk 112 is rotated by hand so as to cause the roller 113 to spread apart the arms 114, 115 until they register with the numeral 8 on said disk, in which position they remain as long as this size of shoe is being trimmed or cut. If a smaller size shoe, such as a Number 6 is to be cut or trimmed next, the cam disk is turned backward to bring the roller 113 into proper position to cause the arms to register with the numeral 6 when the arms strike the handle 82. In the present instance the gear 90 is shown as fastened to the disk 106, which is keyed to the shaft 83.

In operation, the pattern 25 may be used in conjunction with the fixed pattern 34, so that on the movement of the segmental gear 28 in the direction indicated by the arrow 102, the sole of a right shoe may be trimmed or cut so as to give the wide effect on one side of the sole, and on the reverse movement of the said gear and patterns the sole of a left shoe may be cut or trimmed. When the machine is used as thus described, the right and left shoes are alternately trimmed. If it is desired to trim all rights, the shoes are trimmed while on the movement of the segmental gear 28 in the direction indicated by the arrow 102, and no trimming is done on the return movement of the said gear. If it is desired to trim all left shoes, the lever 38 may be turned on its pivot so as to lower the pattern 25 below the fixed pattern 34 and to elevate the pattern 26 above the pattern 34, with the result, that the left shoes are trimmed while the gear 28 is moving in the direction opposite to that indicated by the arrow 102 and are not trimmed on the reverse movement of said gear, or said lefts may be trimmed with the pattern 25 elevated as above described, on the reverse movement of the segmental gear. The rotary guard 10 is also driven from the shaft 54, (see Fig. 2), by a bevel gear 130 thereon, which meshes with a bevel gear 131 on a shaft 132 carried by the guard plate 14 and provided with a pinion 133, which meshes with a pinion 134 in mesh with the pinion 12.

Provision is made for moving the supporting plate 16 upward so that the rotary cutters may make a deep cut, as for instance at the shank of the shoe, and this result may be accomplished as shown (see Fig. 2), by a lever 140 pivoted to the frame and having its front end provided with a fork 141 which engages a projection 143 on the plate 16, the said lever being designed to be connected to a foot treadle, (not shown).

The shaft 59 is provided as shown with a pulley 150, which is suitably driven by a belt (not shown) and said pulley is provided with a clutch member 151, which is adapted to be engaged with and disengaged from a coöperating member 152 fast on the said shaft, by moving the said pulley longitudinally on the shaft by a suitable shipper (not shown). The machine is also provided with a feed wheel 160, which coöperates with the rotary guard 10 and which is fast on a shaft 161 journaled in a movable slide 162 provided with a stud 163 engaged by the forked end 164 of an elbow lever 165, which is operatively connected with a foot treadle (not shown).

The slide 162 is provided with an adjustable stop, shown as a stud 170, which cooperates with nuts 171, 172, on a threaded stud or rod 173 extended from the frame *d*. The feed wheel shaft 161 is driven from the shaft 62 by gears 180, 181.

In practice, the pivoted portion 17 of the frame will be detachably secured to the main frame in any suitable manner so as to render the portion 17 stationary except when it is desired to move the guard 10 away from the cutter axially.

Claims.

1. In a machine of the class described, in combination, a rotary cutter, a rotatable guard coöperating therewith, a movable plate carrying said guard, a supporting plate for said guard carrying plate, a segmental gear pivoted to the guard carrying plate, a pattern movable with said segmental gear, means carried by the supporting plate and coöperating with said pattern to effect movement of said guard carrying plate, a hollow rotatable shaft extended through said guard carrying plate, a gear on said hollow shaft meshing with the segmental gear, a driving shaft, normally loose gears thereon, a gear on the hollow shaft meshing with said loose gears, a clutch mem-

ber slidable on the driving shaft and coöperating with said loose gears, a clutch-operating shaft extended through said hollow shaft and connected with said clutch member, a handle on said clutch-operating shaft, means coöperating with said handle to retain the clutch in engagement with one of said loose gears, and means coöperating with said handle for disengaging the clutch member from the loose gear with which it is engaged, for the purpose specified.

2. In a machine of the class described, in combination, a rotary cutter, a rotatable guard coöperating therewith, means to rotate said guard, a movable support for said guard, a segmental gear mounted on said support, a pattern movable with said segmental gear, means coöperating with said pattern for moving said support, a gear carried by said support and meshing with said segmental gear, a driving shaft carried by said movable support, normally loose gears on said driving shaft, gearing carried by said movable support for connecting the segmental gear with said loose gears, a clutch member on said driving shaft coöperating with said loose gears, a shaft to operate said clutch member, a handle on said shaft, means to hold said clutch member in engagement with one of the said loose gears, and means movable with said segmental gear for disengaging said clutch member from the loose gear with which it is engaged, substantially as described.

3. In a machine of the class described, in combination, a rotary cutter, a rotatable guard coöperating therewith, a sliding support for said guard, a sliding frame carrying said support, and a pivoted frame carrying said sliding support to permit said guard to be moved axially toward and away from said rotary cutter, means for rotating said guard, and a pattern to effect bodily movement of said guard with relation to said cutter, substantially as described.

4. In a machine of the class described, in combination, a rotary cutter, a rotatable guard coöperating therewith, a support for said guard, a pattern, a movable support for said pattern, means coöperating with said pattern for moving said guard with relation to said rotary cutter, a driving shaft carried by said support and rotatable in one direction, and power-operated mechanism carried by said support and operatively connected with said driving shaft for moving said pattern in opposite directions, substantially as described.

5. In a machine of the class described, in combination, a rotary cutter, a rotatable guard coöperating therewith, a support for said guard, a pattern, a movable support for said pattern, means coöperating with said pattern for moving said guard with relation to said rotary cutter, a driving shaft carried by said support and rotatable in one direction, power-operated mechanism carried by said support and operatively connected with said driving shaft for moving said pattern in opposite directions, and means carried by said support to automatically render said power-operated mechanism inoperative, substantially as described.

6. In a machine of the class described, in combination, a cutter, a guard coöperating therewith, a movable support for said guard, a segmental gear mounted on said support, a pattern carried by said segmental gear, means coöperating with said pattern to effect bodily movement of said guard with relation to said cutter, a driving shaft carried by said support and rotatable in one direction, and power-operated mechanism carried by said movable support and operatively connected with said driving shaft for moving said segmental gear in opposite directions, substantially as described.

7. In a machine of the class described, in combination, a cutter, a guard coöperating therewith, a movable support for said guard, a segmental gear mounted on said support, a pattern carried by said segmental gear, means coöperating with said pattern to effect bodily movement of said guard with relation to said cutter, a continuously rotating driving shaft for said segmental gear carried by said support, gears normally loose on said driving shaft, a clutch member on said driving shaft intermediate said gears and normally disengaged therefrom, gearing carried by said support connecting said loose gears with said segmental gear, and a shaft carried by said support and connected with said clutch member, substantially as described.

8. In a machine of the class described, in combination, a cutter, a guard coöperating therewith, a movable support for said guard, a pattern, a gear to which said pattern is secured, a driving shaft for said gear carried by said support, gearing carried by said support for connecting said driving shaft with the gear carrying said pattern, and normally disconnected from said driving shaft, and means carried by said support for connecting said gearing with said driving shaft, substantially as described.

9. In a machine of the class described, in combination, a cutter, a guard coöperating therewith, a movable support for said guard, a pattern, a gear to which said pattern is secured, a driving shaft for said gear carried by said support, gearing carried by said support for connecting said driving shaft with the gear carrying said pattern, and normally disconnected from said driving shaft, means carried by said support for connecting said gearing with said driving shaft, and means carried by said support for automatically

disconnecting said gearing from said driving shaft, substantially as described.

10. In a machine of the class described, in combination, a rotary cutter, a rotary guard coöperating therewith a movable support for said guard, a driving shaft carried by said support, gearing carried by said support for connecting said driving shaft with said rotary guard to rotate the same, a pattern to effect bodily movement of said guard with relation to said cutter, gearing operated from said driving shaft for effecting movement of said pattern in opposite directions, and means carried by said support to connect the gearing which operates the pattern with and from said driving shaft, substantially as described.

11. In a machine of the class described, in combination, a rotary cutter, a rotary guard coöperating therewith a movable support for said guard, a driving shaft carried by said support, gearing carried by said support for connecting said driving shaft with said rotary guard to rotate the same, a pattern to effect bodily movement of said guard with relation to said cutter, gearing operated from said driving shaft for effecting movement of said pattern in opposite directions, a clutch member to connect the gearing which operates the pattern with said driving shaft, and means carried by said support for automatically operating said clutch member to disconnect said gearing from said driving shaft, substantially as described.

12. In a machine of the class described, in combination, a cutter, a guard coöperating therewith a movable support therefor, a pattern to effect bodily movement of said guard with relation to said cutter, power-operated means carried by said support for effecting movement of said pattern in opposite directions, a driving shaft rotatable in one direction, and means carried by said support to connect said power-operated means with said driving shaft to effect movement of said pattern in opposite directions, substantially as described.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

AMBROSE S. VOSE.

Witnesses:
JAS. H. CHURCHILL,
J. MURPHY.