June 20, 1950 L. SABO 2,511,999

HEEL BREAST FLAP TRIMMING MACHINE

Filed Oct. 5, 1946 7 Sheets-Sheet 1

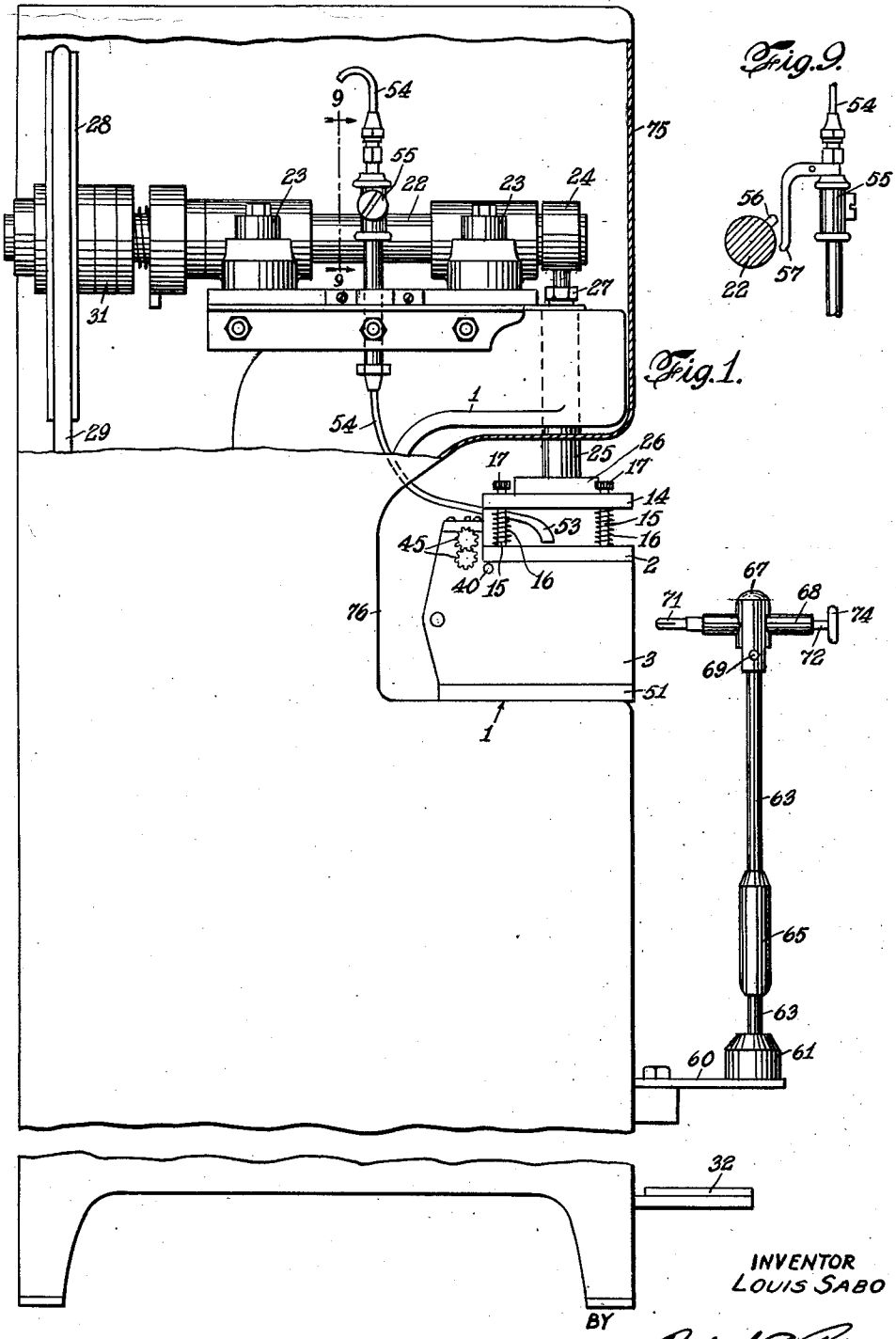

Fig. 1.

Fig. 9.

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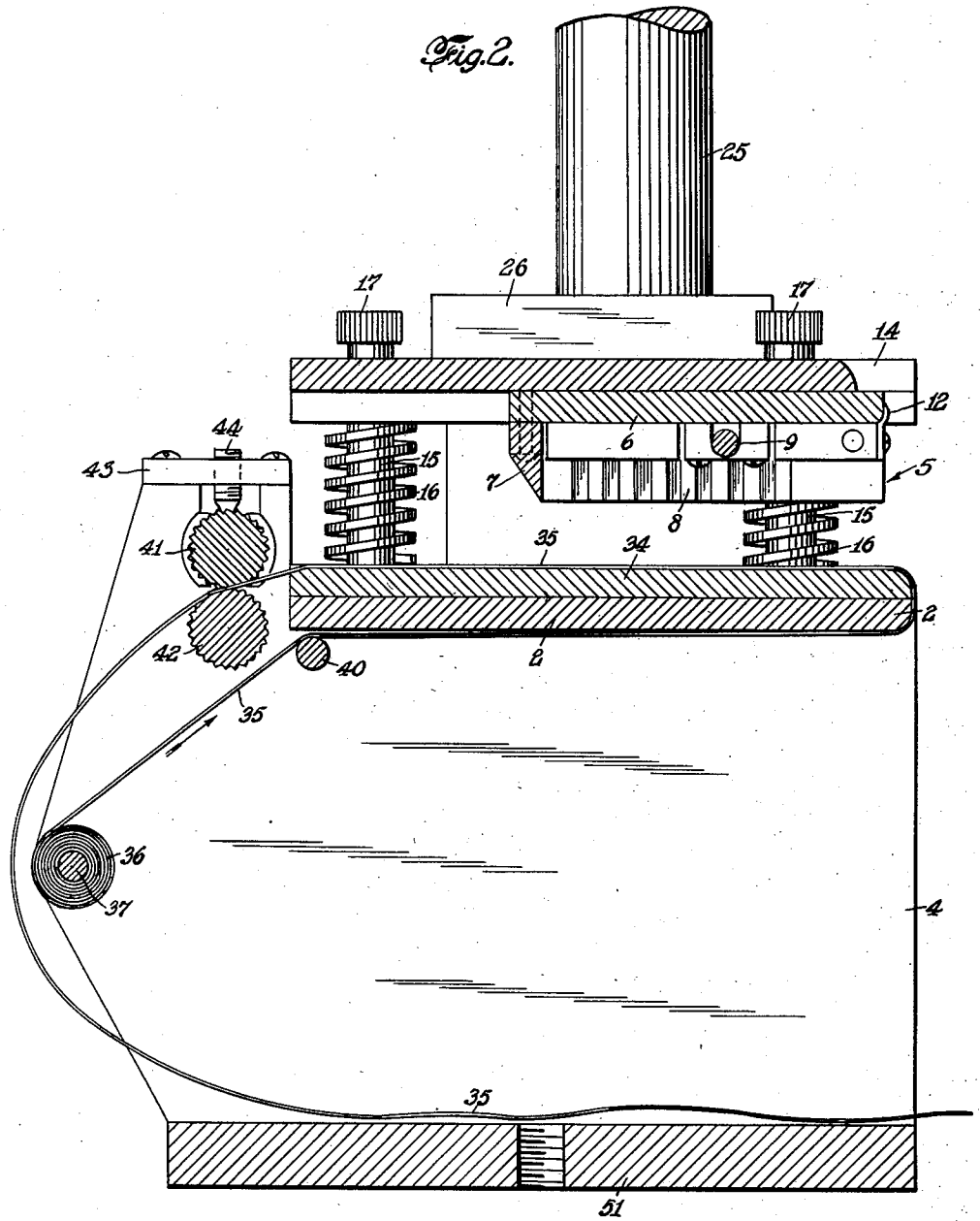
HEEL BREAST FLAP TRIMMING MACHINE

Filed Oct. 5, 1946 7 Sheets-Sheet 2

Fig. 2.



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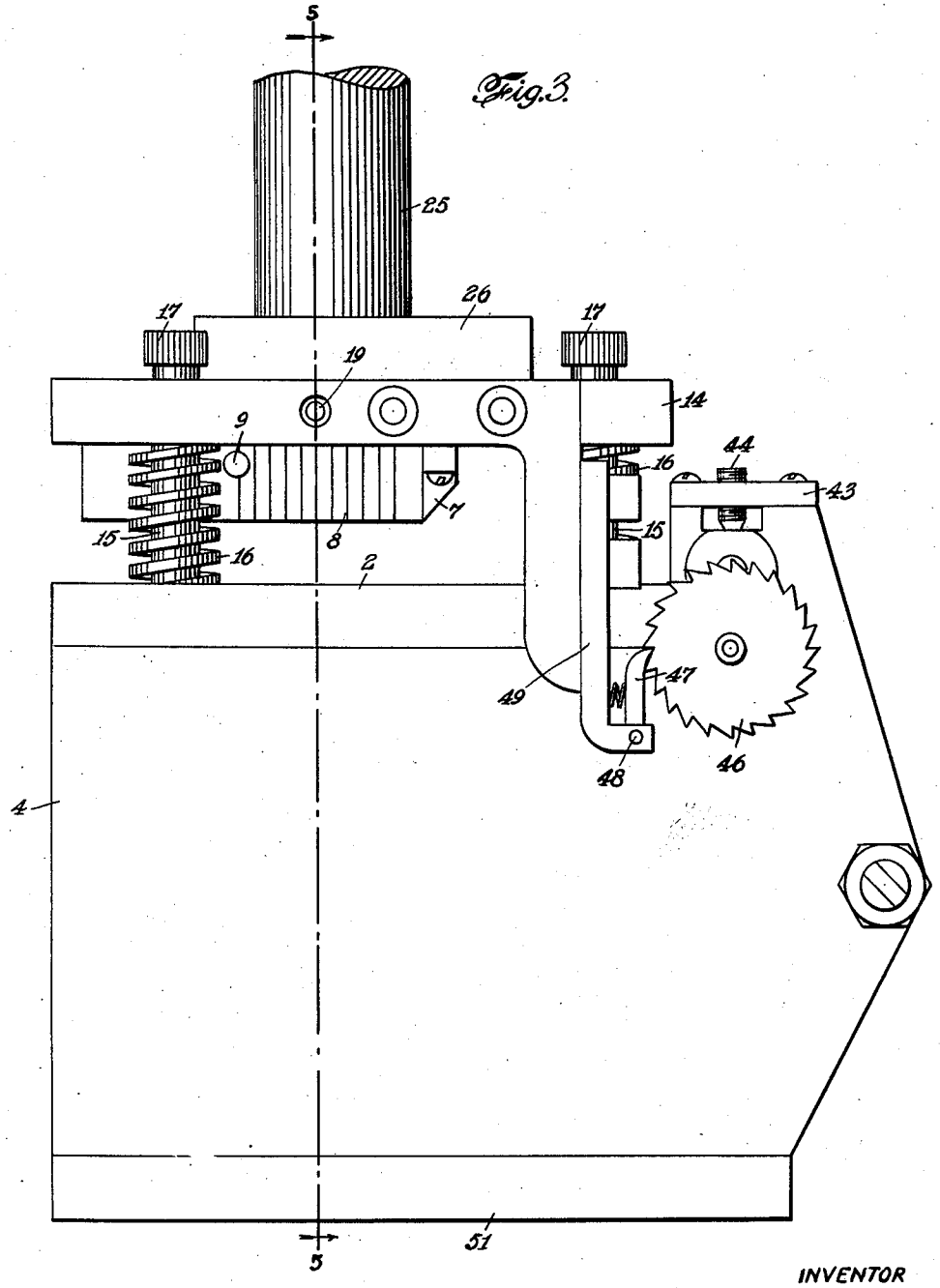
HEEL BREAST FLAP TRIMMING MACHINE

Filed Oct. 5, 1946 7 Sheets-Sheet 3

Fig. 3.



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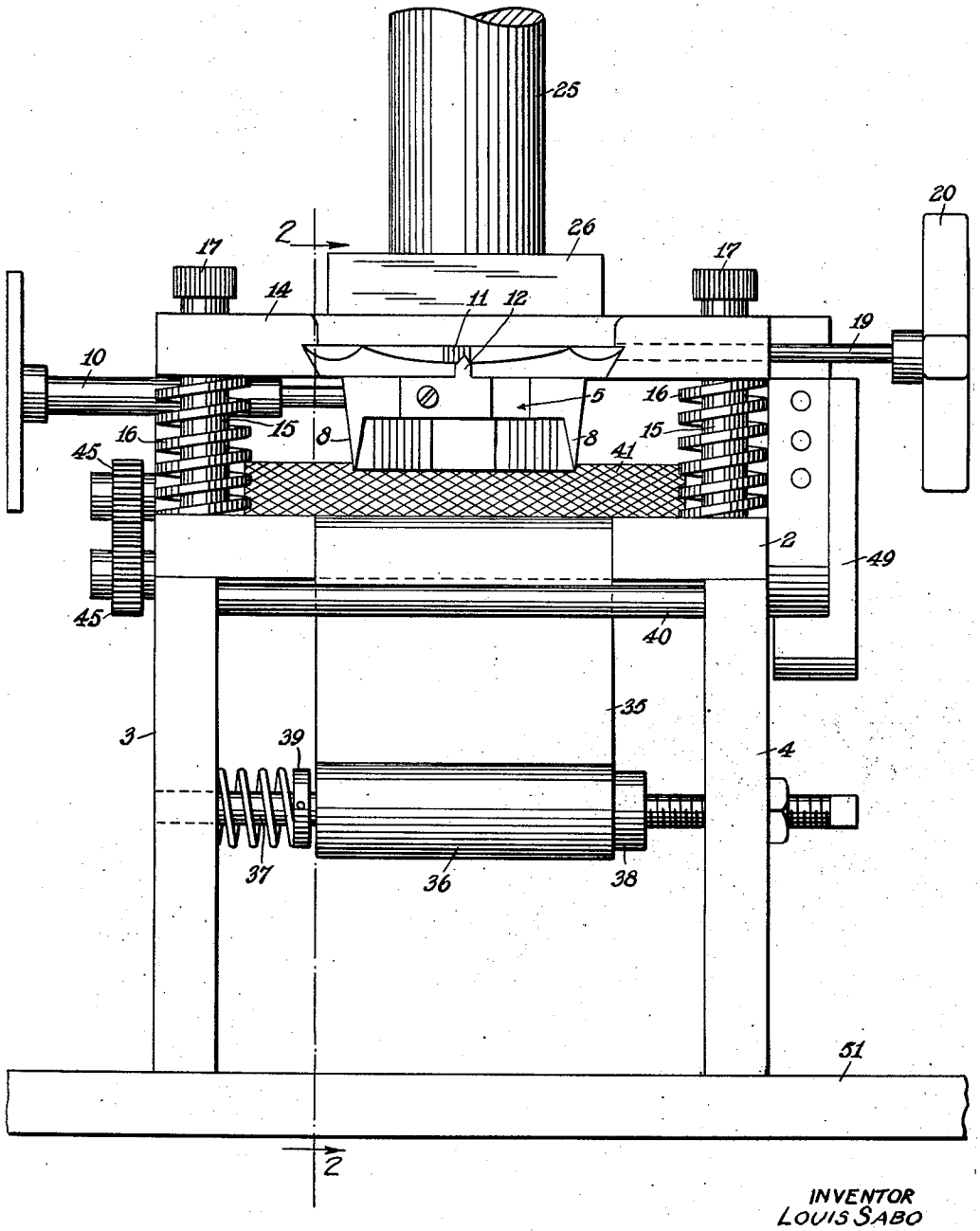
HEEL BREAST FLAP TRIMMING MACHINE

Filed Oct. 5, 1946 7 Sheets-Sheet 4

Fig. 4.



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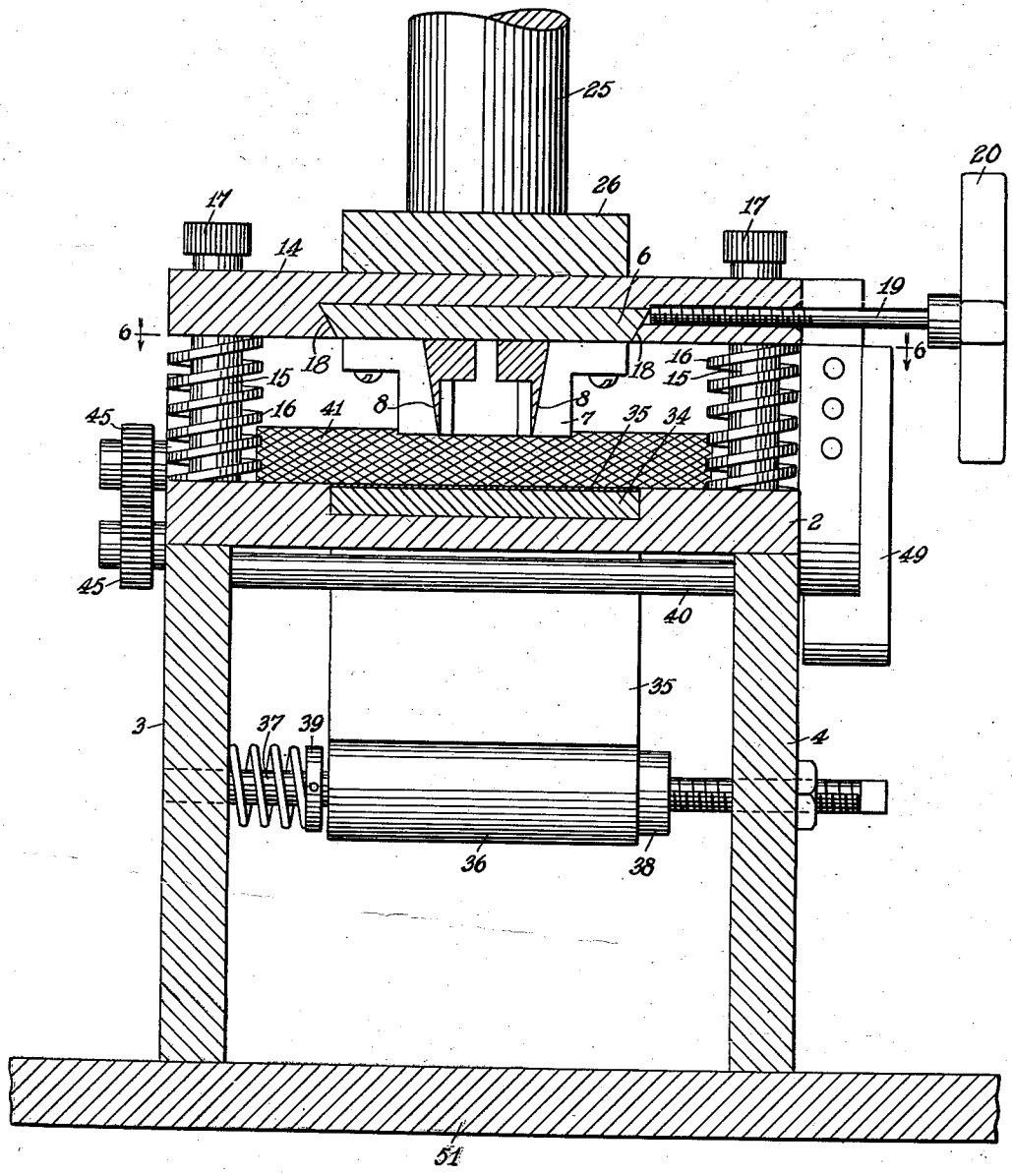
HEEL BREAST FLAP TRIMMING MACHINE

Filed Oct. 5, 1946 7 Sheets-Sheet 5

Fig. 5.



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June 20, 1950 L. SABO 2,511,999

HEEL BREAST FLAP TRIMMING MACHINE

Filed Oct. 5, 1946 7 Sheets-Sheet 6

Fig. 6.

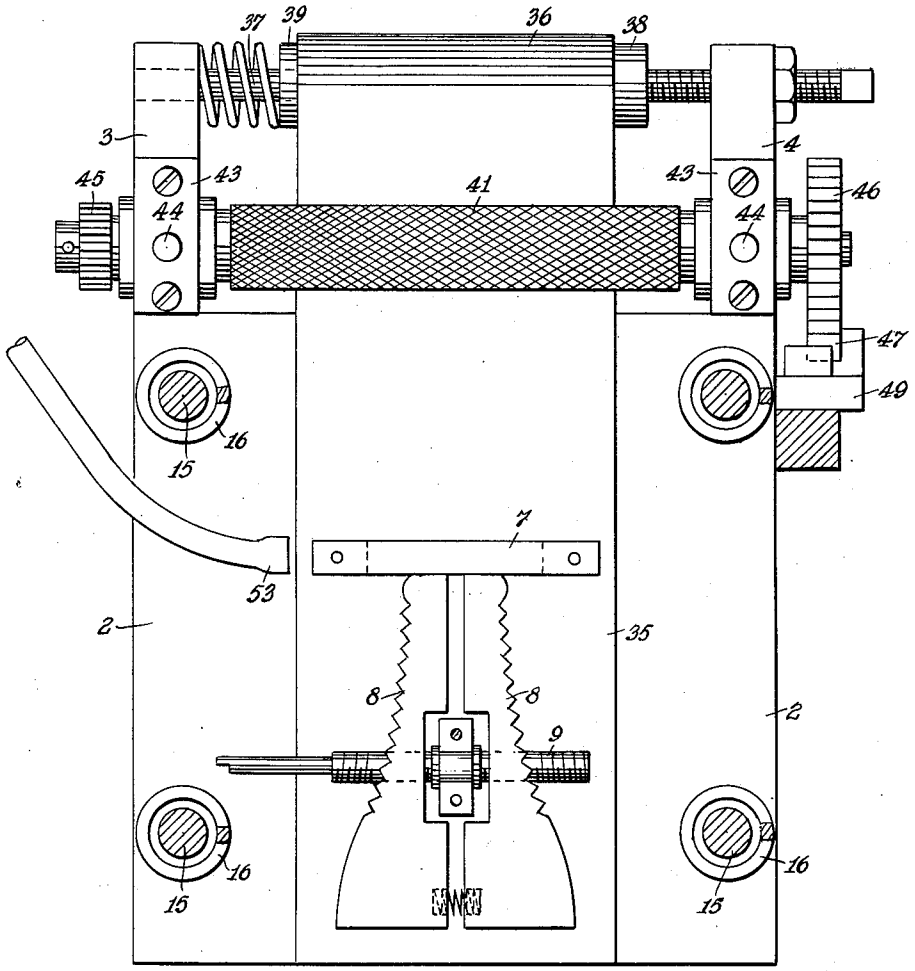
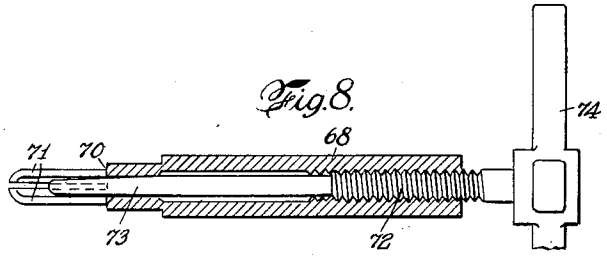


Fig. 8.



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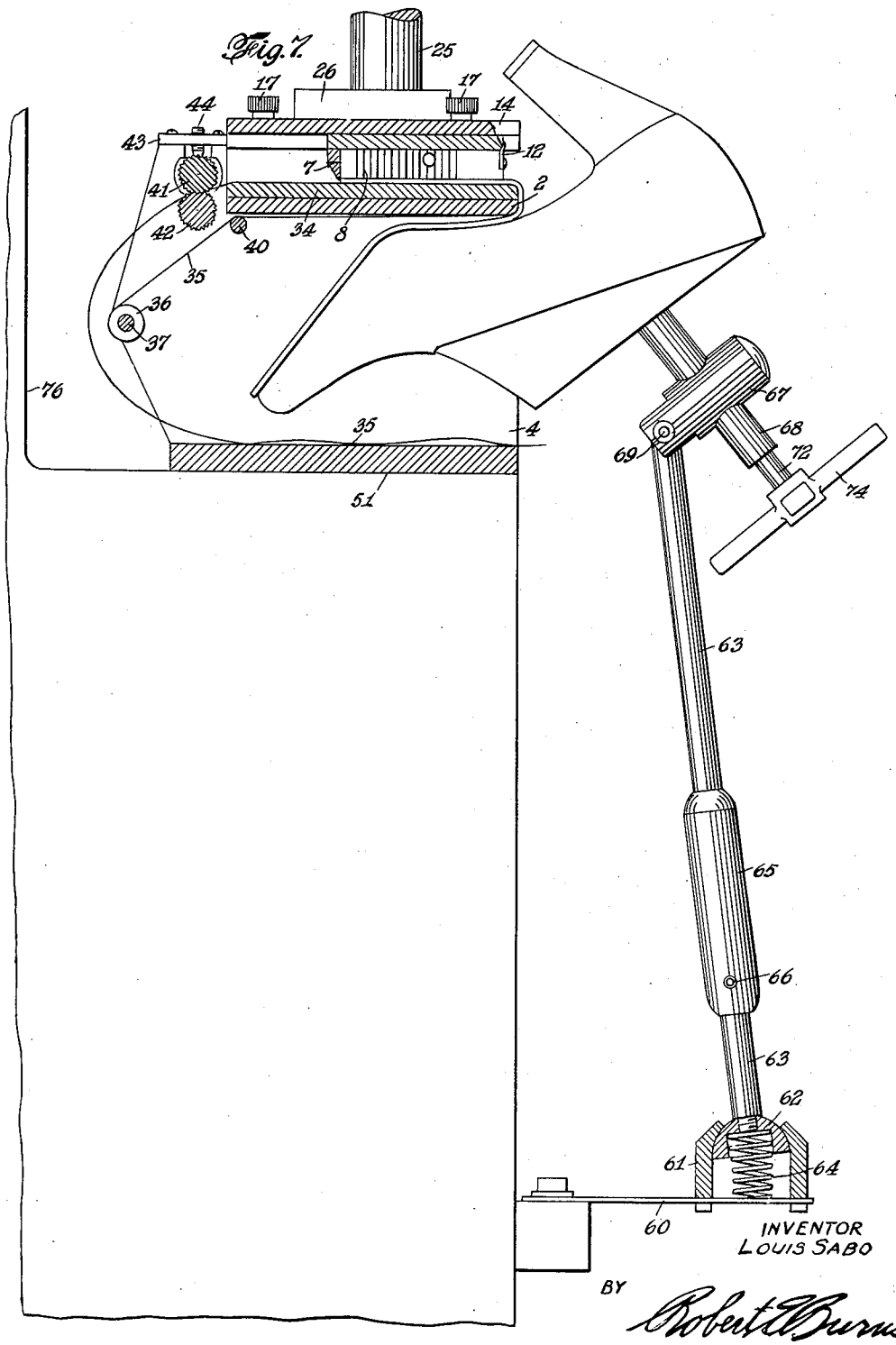
HEEL BREAST FLAP TRIMMING MACHINE

Filed Oct. 5, 1946 7 Sheets-Sheet 7

Fig. 7.



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Patented June 20, 1950

2,511,999

UNITED STATES PATENT OFFICE

2,511,999

HEEL BREAST FLAP TRIMMING MACHINE

Louis Sabo, Astoria, N. Y., assignor to Del-Sab Corporation, New York, N. Y., a corporation of New York

Application October 5, 1946, Serial No. 701,531

1 Claim. (Cl. 12—16.6)

1

The present invention relates to a machine for cutting blanks of leather or similar material to predetermined shape and size. The invention is particularly applicable to a machine for trimming an attached heel breast flap blank of a shoe having a heel fixed in place, and is shown and described by way of example embodied in such a machine.

While the cutting of blanks to predetermined shape by means of two coacting dies operating with a shearing action has been proposed, it has been found much more economical and satisfactory to use a die having a sharp cutting edge working against a work-supporting surface, hereinafter referred to generically as a platen. The latter type of die is less expensive to make, can more readily be made to cut a blank to ornamental shape as disclosed in my Patents Nos. 2,383,514 and 2,383,515, and can be made adjustable to cut different sizes of blanks of similar shape, for example in accordance with my Patent No. 2,368,571, and my pending application, Serial No. 701,532. However, difficulty has been encountered in assuring a perfectly clean cut edge at all times. This difficulty is especially troublesome when, as in trimming an attached heel breast flap blank of a shoe having a heel attached in position, it is necessary or desirable to cut the blank from the flesh side of the leather. As the surface of the platen becomes chewed or scored by the cutting edge of the die, it becomes progressively more and more difficult to avoid producing improperly cut blanks. A ragged or torn edge is unsightly and is intolerable in high grade shoes. The trimming of defectively cut blanks by hand is not feasible, since it would prohibitively increase the cost of production. Moreover, it would be difficult, if not impossible, to trim by hand a serrated, scalloped, or other fancy edge as produced in accordance with my above mentioned Patents Nos. 2,383,514 and 2,383,515.

It is an object of the present invention to overcome these difficulties and to provide a trimming machine that will at all times produce a clean cut edge and will continue to produce such edges even after extended periods of operations.

In accordance with the present invention a clean cut edge is assured by the combination of three coacting features, which comprise:

1. Providing means for clearing the platen after each cutting operation of any scraps of material or other foreign particles which might otherwise damage the cutting edge of the die, or the cutting face of the platen, or might, by being interposed between the platen and a subsequent blank,

2

prevent the blank from lying flat on the plate and thereby interfere with producing a clean cut in the succeeding cutting operation.

2. Providing an expendable platen which is intermittently moved between successive cutting operations so as to provide a fresh cutting surface for coaction with the cutting edge of the die each time a cut is made. Hence, although the die may cut into and thereby damage the cutting surface of the platen, a previously made cut will not interfere with the cutting operation, since a new increment of the platen is presented to the cutting edge of the die for each succeeding cut.

3. Providing improved means for supporting and positioning a shoe so that it is positioned accurately and held steady during the cutting operation. Improperly cut blanks resulting from improper positioning or from movement of the shoe while the cut is being made are thereby avoided.

A further feature of my invention is that, despite the provision of means for clearing the cutting surface of the platen, and for supplying a fresh cutting surface for each cutting operation, the shoe is held in such manner by the shoe supporting means that there is no obstruction to the positioning of a shoe in the manner illustrated in the drawings with the toe portion below the platen, the heel breast blank between the platen and the cutting edge of the die, and the attached heel of the shoe above and in front of the die. The aforementioned features of my invention thus cooperate in securing the desired result without mutual interference, restriction or compromise.

Other features of my invention will become apparent from the following description and appended claim, in conjunction with the accompanying drawings, in which there is shown by way of example, an embodiment of my invention in the form of a machine for trimming an attached heel breast flap of a shoe after the heel has been secured in place.

In the drawings,

Fig. 1 is a side elevation of the machine, a portion of the housing being broken away to show interior operating mechanism.

Fig. 2 is a vertical section through the platen, the die and associated mechanism taken approximately on the line 2—2 in Fig. 4.

Fig. 3 is an enlarged side elevation of the platen, die and associated mechanism taken from the side opposite to that shown in Fig. 1.

Fig. 4 is a front elevation of the portion of the machine shown in Fig. 3.

Fig. 5 is a vertical section taken approximately on the line 5—5 in Fig. 3.

Fig. 6 is a horizontal section taken approximately on the line 6—6 in Fig. 5.

Fig. 7 is a view similar to Fig. 2, but shows in addition the shoe supporting means and a shoe properly positioned in the machine with the die shown in cutting position.

Fig. 8 is an enlarged longitudinal section through the shoe supporting post shown in Figs. 1 and 7.

Fig. 9 is a detail sectional view taken approximately on the line 9—9 in Fig. 1.

The machine illustrated in the drawings is provided with suitable structure for supporting the various operating parts, the structure being herein referred to generically as a base or frame and designated by the reference numeral 1. The operating mechanism of the machine includes a reciprocable die having a cutting edge and a platen which supports the blank that is to be cut to shape and provides a cutting surface against which the cutting edge of the die acts. The platen is carried by a horizontal plate 2 which is supported at its sides by spaced vertical plates 3 and 4 (Fig. 5).

The die 5 is provided with a cutting edge of such configuration as to cut a blank of the desired contour in a single cutting operation. Except as may be otherwise indicated by the context, the term "contour" is herein used to designate the shape and size to which the blank is cut. The die 5 is preferably adjustable for cutting blanks of different sizes as described more fully and claimed in my copending application, Serial No. 701,532, and comprises a base plate 6, an end cutting edge 7 mounted on said base plate, and a pair of side cutting edges 8 which are slidably mounted on the base plate and are movable toward and away from one another by means of a right-left hand screw 9. A removable handle or knob 10 (Fig. 4) is provided for rotating the adjusting screw 9 to vary the distance between the side cutting edges 8 and thereby vary the width of the blank cut. The width to which the die is adjusted is indicated by a scale 11 on the base plate of the die and a cooperating pointer 12, which is movable with one of the side cutting edges 8.

The die 5 is carried by a horizontal plate 14 which is spaced above and approximately parallel to the platen supporting plate 2, and is movable toward and away from the latter plate, being guided in its movement by a plurality of bolts or posts 15 which project upwardly from the supporting plate 2. The movable plate 14 is resiliently supported by a plurality of helical compression springs 16 which surround the said posts. The posts 15 are preferably provided with heads 17 for limiting upward movement of the die carrying plate 14. The die is adjustably mounted on the lower face of the plate 14 by means of interengaging dove-tail surfaces 18 (Fig. 5) which permit adjusting the position of the die by sliding it forwardly or rearwardly relative to the plate. A screw 19 turned by a knob 20 is provided for releasably locking the die in adjusted position. The plate 14 is moved downwardly to press the die against the platen by means of punch press mechanism illustrated in Fig. 1. A shaft 22 rotatably supported by suitable bearings 23 carries an eccentric 24 adapted to engage the upper end of a plunger 25 which is vertically movable and engages at its lower end a reinforcing block 26 on the upper face of the plate 14.

An adjustable screw head 27 at the upper end of the plunger provides for adjusting the stroke of the plunger. A pulley 28 is rotatable on the shaft 22 and is driven by a belt 29 from a suitable power source, as for example an electric motor (not shown). A one revolution clutch 31 controlled by a foot pedal 32 through suitable linkage (not shown) provides a driving connection between the shaft 22 and the pulley 28. During operation of the machine the pulley 28 rotates continuously. When the operator steps on the pedal 32 the clutch 31 is engaged to rotate the shaft 22 one complete revolution. Rotation of the shaft causes the eccentric 24 to move the plunger 25 and plate 14 downwardly against the action of the springs 16 and presses the die against the platen to cut to the desired shape, as determined by the shape of the die, a blank positioned between the die and platen.

The plate 2, which is preferably formed from a hard, strong material such as steel, is recessed as indicated in Figs. 2 and 5, to receive an inlay or inset 34 which is formed of softer material, for example softer metal, fibre or plastic material, and is located below the die 5. The cutting surface of the platen, i. e., the surface against which the cutting edge of the die acts, is provided by a strip of flexible scissile material, such as paper, fabric, metal foil, plastic, or the like, supported by the plate 2 including the inset 34. The strip 35 is fed from a supply roll or spool 36 (Figs. 2 and 5) which is rotatably supported by a rod 37 extending across between the two side plates 3 and 4. The roll 36 is held between an adjustable collar 38 and a spring pressed collar 39 on the rod 37, so as to provide centering means and adjustable frictional resistance to rotation of the roll. The strip 35 passes upwardly over a guide-bar 40, forwardly along the underside of the plate 2, up over the front edge of the plate, and back over the upper face of the plate, as illustrated in Fig. 2. Step by step feeding movement of the strip 35 over the supporting plate 2 is effected by opposed feed rollers 41 and 42 which are rotatably supported at their ends by suitable bearings 43 (Fig. 6). Means are provided for resiliently or adjustably pressing the two rollers 41 and 42 together so as to grip the strip 35 firmly between them. Adjustable screws 44 (Fig. 2) are illustrated in the drawings for this purpose. At one end the rollers 41 and 42 are provided with intermeshing gears 45 for rotating the rollers in unison. At the opposite end one of the rollers, preferably the lower roller 42, is provided with a ratchet wheel 46 (Figs. 3 and 6), which is engaged by a spring pressed pawl 47 pivotally mounted at 48 on a bracket 49, which extends downwardly from the plate 14 that carries the die 5. When the plate and die are moved downwardly to make a cut, and then upwardly, the pawl 47 engages a tooth of the ratchet 46 to turn the rolls 41 and 42 through a predetermined angle and thereby advance the strip 35 one step forwardly. The amount the strip is moved is adjustable by forming the bracket 49 of relatively adjustable sections whereby the pawl 47 can be positioned to pass over one, two or three teeth of the ratchet 46 during downward movement of the plate 14, and hence turn the ratchet a corresponding amount on the upstroke of the plate. As the rotation of the rolls 41 and 42 and the movement of the strip occur only during the upward movement of the die, the strip 35 is stationary during each cutting operation and is advanced an adjustable amount immediately after a

cut has been made. The substantially positive feed of the rollers 41 and 42 pulls the strip forwardly against the resistance offered by the friction applied to the supply spool or roll 36 and the friction resulting from the strip passing over the guide rod 40 and the front edge of the plate 2, and results in the portion of the strip that is beneath the die being maintained under tension. The tension is adjustable by varying the amount of friction applied to the supply roll, as described above. The strip is thus kept taut and lies flat on the insert 34 of the platen supporting plate 2. The upper surface of the insert 34 is preferably slightly lower than that of the adjacent side portions of the plate 2 so as to provide a slight edge or channel for guiding the strip 35. After passing beneath the die 5 and between the feed rolls 41, 42, the strip 35 passes rearwardly behind the supply spool 36 and hence downwardly and forwardly along the upper face of a plate 51 which is part of the supporting structure for the platen. The expended strip can, if desired, be collected on a suitable reel or in a suitable receptacle and can be periodically torn off by the operator.

With prior art machines the difficulty has been experienced that when the machine has been operated for some time and the surface of the platen has been scored or chewed up by the die, the machine no longer produces a clean cut edge. The difficulty is aggravated when the die is adjusted either as to position or to size, so that the new cut intersects or is adjacent to the old scoring of the platen, since a considerable area of the platen may thereby become mutilated and an uneven surface is presented to the cutting edge of the die. The use of the expendable strip 35 in place of the usual platen and the step by step movement of the strip over the supporting plate 2 in accordance with the present invention has been found to overcome these difficulties since a fresh cutting surface is presented to the cutting edge of the die for each successive cutting operation. This amounts in effect to providing a new platen for each cut. An accurate and clean cut edge is thereby assured on each blank that is trimmed. Moreover, the clean cutting characteristics of the machine do not deteriorate with continued use and are not disturbed by adjustment of the die either by moving the said cutting edges 8 toward or away from one another, or by adjusting the position of the die relative to the base plate 14.

An accurately and cleanly cut blank is further assured in accordance with the present invention by the provision of means for clearing the cutting surface of the platen between successive cutting operations. When a blank is trimmed, small pieces of scrap leather or other material may be left on the platen. When a new blank is positioned in the machine to be trimmed, the particles of foreign matter may prevent the blank from lying flat on the platen, and thereby prevent the die from making a clean cut.

In accordance with my invention the cutting surface of the platen is cleared by a stream or blast of air directed across the platen immediately after each cutting operation. The air flow may be produced by any suitable means, as by air pressure or by suction. In the embodiment illustrated in the drawings, a nozzle 53 is located at one side of the platen just above its upper surface and is constructed and arranged to blow scraps or other foreign matter off the platen. The term "nozzle" is herein used generically to

designate any suitable means for providing an air-flow as required. Air under pressure is supplied to the nozzle by an airline or conduit 54, the supply of air to the nozzle being controlled by a normally closed spring valve 55. A projection 56 on the shaft 22 (Figs. 1 and 9) is adapted to engage a valve actuating lever 57 to open the valve 55 momentarily each time the shaft 22 revolves. The angular relation of the projection 56 and the eccentric 24 that actuates the cutting die are such that air is supplied to the nozzle 53 immediately after the die has made a cut and during the upstroke of the die. The clearing action of the air stream and the step by step movement of the platen strip 35 thus cooperates to present a clear and fresh cutting surface to the cutting edge of the die for each cutting operation.

A further factor that has in the past contributed to producing unsatisfactorily cut blanks has been the difficulty of properly positioning a shoe and holding it perfectly steady while the heel breast flap blank is being trimmed. This difficulty is overcome in accordance with the present invention by a new and improved shoe support. A bracket 60 (Figs. 1 and 7) projecting forwardly from the base of the machine a substantial distance below the platen and the cutting die carries a socket 61 which receives a ball 62 on the lower end of an upwardly extending member or shaft 63. This ball and socket connection provides a universal mounting for the shaft 63 so that the shaft can be rotated and tilted in any direction. The lower portion of the ball 62 is cut away and is centrally recessed to receive one end of a compression spring 64, the other end of which bears against a portion of the bracket 60. By pressing upwardly on the bell 62, the spring 64 tends to hold the shaft in an upright position, while at the same time pressing the ball against the socket to provide frictional resistance for maintaining the shaft in any position to which it is moved by the operator. The shaft 63 is longitudinally extendable by means of a telescopic joint 65 and can be locked in any adjusted position by a set screw 66. At the upper end of the shaft 63 there is frictionally pivoted a tiltable split fitting 67. A hollow post 68 extends through and is held by the fitting 67 so as to be frictionally rotatable relative to the fitting. A screw or bolt 69 is provided for tightening the fitting 67 so as to hold the fitting and the post 68 in the angular positions to which they are adjusted. The inner end of the post 68 is of reduced diameter to provide a shoulder 70 and is split longitudinally to provide a plurality of fin fingers 71 (Fig. 8). The reduced end portion of the post 68 is of such diameter as to fit into the usual hole that is provided in a shoe last. The outer end portion of the hollow post 68 is internally threaded to receive an externally threaded shaft 72 which has a rounded or tapered inner end portion 73 adapted to engage the spring fingers 71 and spread them out when the shaft 72 is rotated so as to be moved longitudinally of the hollow post 68 by interengagement of the above mentioned threads. A handle 74 is provided for rotating the shaft 72 to screw it into and out of the hollow post 68.

With the upper end of the upright shaft or column 63 swung out away from the platen and the die and with the threaded shaft 72 screwed out sufficiently to permit contraction of the split inner end of the hollow post 68, a lasted shoe having an attached heel and heel breast flap blank is

mounted on the post 68 slipping the inner end of the post into the usual hole provided in the shoe last. The handle 74 is then turned to screw the shaft 72 inwardly to expand the fingers 71 and secure the lasted shoe firmly on the post 68. The shoe and support are then swung forwardly by pivotal movement of the shaft 63 in the ball and socket joint 61, 62, while guiding the heel breast flap blank into position between the platen 35 and the cutting edge of the die. With the shoe properly positioned as shown in Fig. 7, the toe portion is accommodated in the space beneath the platen supporting plate 2, while the attached heel is disposed forwardly of and above the die. With the shoe thus properly positioned, the operator steps on the pedal 32 (Fig. 1) to engage the one revolution clutch 31 and thereby actuate the die to cut the heel breast blank in the shape and size determined by the contour of the cutting edge of the die.

The machine is preferably enclosed by a housing 75 which is recessed as indicated at 76 to afford access to the cutting die and platen. The housing encloses the driving motor, the pulley 28, the shaft 22 and associated mechanism and not only improves the appearance of the machine, but also protects the mechanism and increases the safety with which the machine can be operated.

While a specific machine has been shown and described by way of example to illustrate my invention, it will be understood that the invention is not limited to the specific form shown, and that various changes can be made in the structural form and details of the machine, without departing from the spirit of the invention as defined in the appended claim.

What I claim and desire to secure by Letters Patent is:

A machine for trimming heel breast flaps comprising a frame, a platen support having a rounded front edge and carried by the frame, a roll of expendable platen material rotatably carried by the frame on the rear side thereof, the platen material adapted to extend under the bottom surface of the platen support around the rounded front edge and over the top surface thereof, a ratchet and pawl and opposed feed rollers

actuated thereby, the rollers positioned on opposite sides of the platen material to intermittently effect the movement thereof a distance sufficient to expose a fresh portion of the expendable platen for contact with the die, but less than a distance equal to the length of the heel breast flap, a cutting die having a generally U-shaped cutting edge, a rotatably supported power shaft, operator controlled means for intermittently rotating said shaft one revolution, an eccentric carried by the shaft for moving the die, a reciprocable support for the cutting die actuated by the eccentric, adjusting means carried by the reciprocable support for varying the position of the cutting die over the surface of the reciprocable support, resilient means for returning the support to an upward position away from the platen after it has been actuated downwardly, the ratchet and pawl being adapted to be actuated in timed relation with the reciprocation of the die after each cutting operation, and means for supporting a shoe having a heel breast flap blank attached thereto with said blank positioned between said platen and said cutting die.

LOUIS SABO.

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