

No. 835,430.

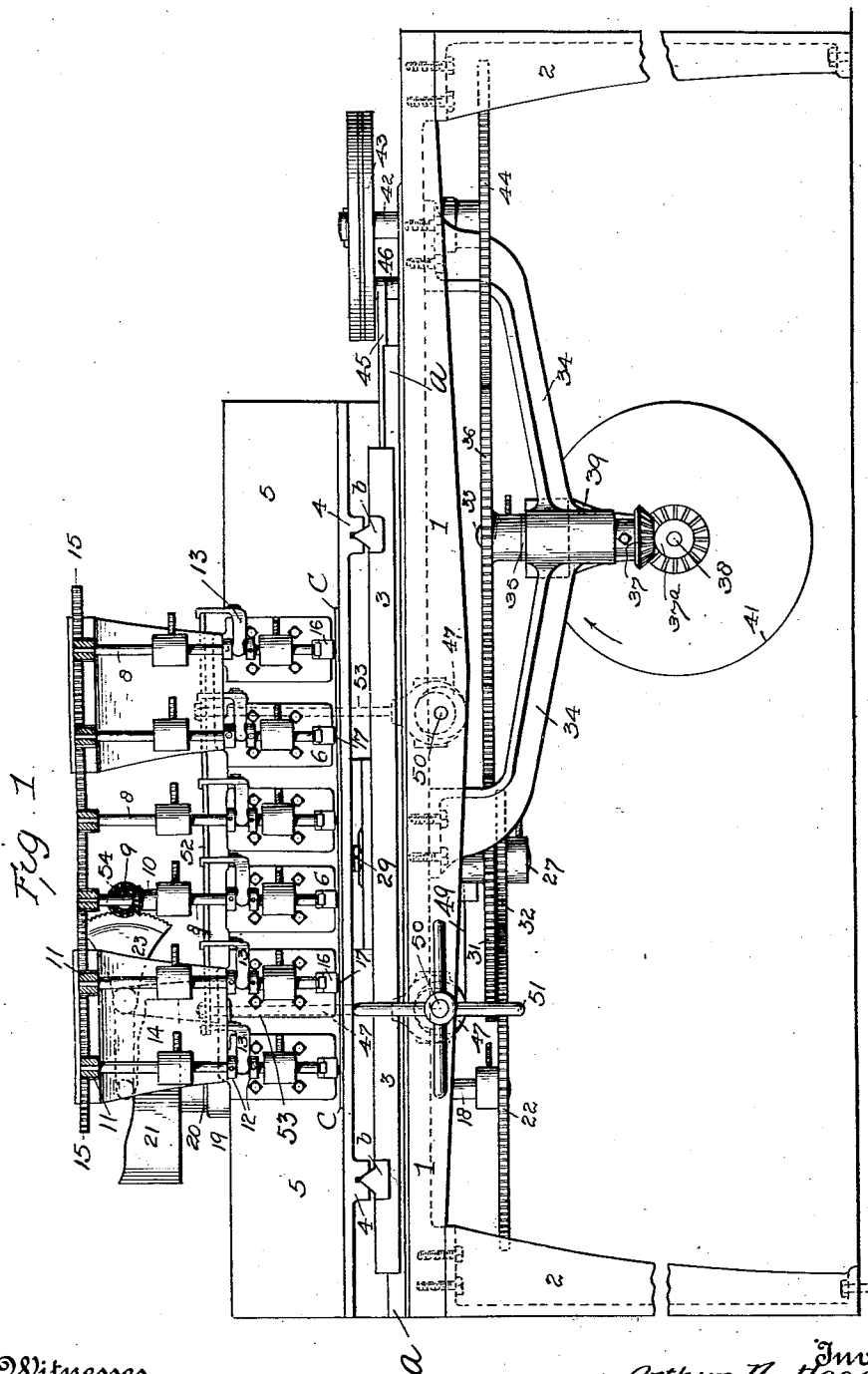
PATENTED NOV. 6, 1906.

A. N. HOOD.

MACHINE FOR CUTTING OUT RUBBER SOLES OR SIMILAR ARTICLES.

APPLICATION FILED JAN. 18, 1904.

3 SHEETS—SHEET 1.



Witnesses
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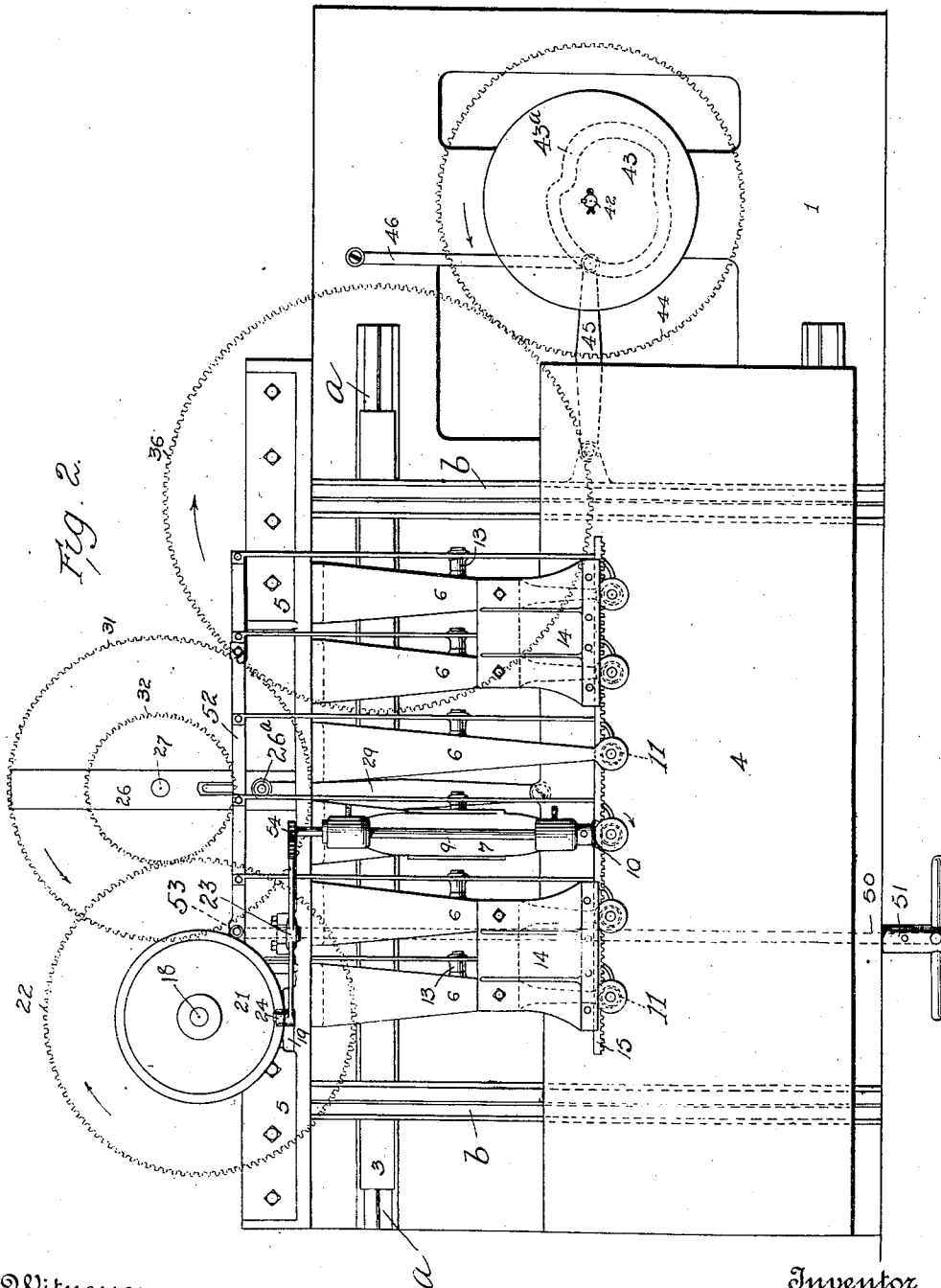
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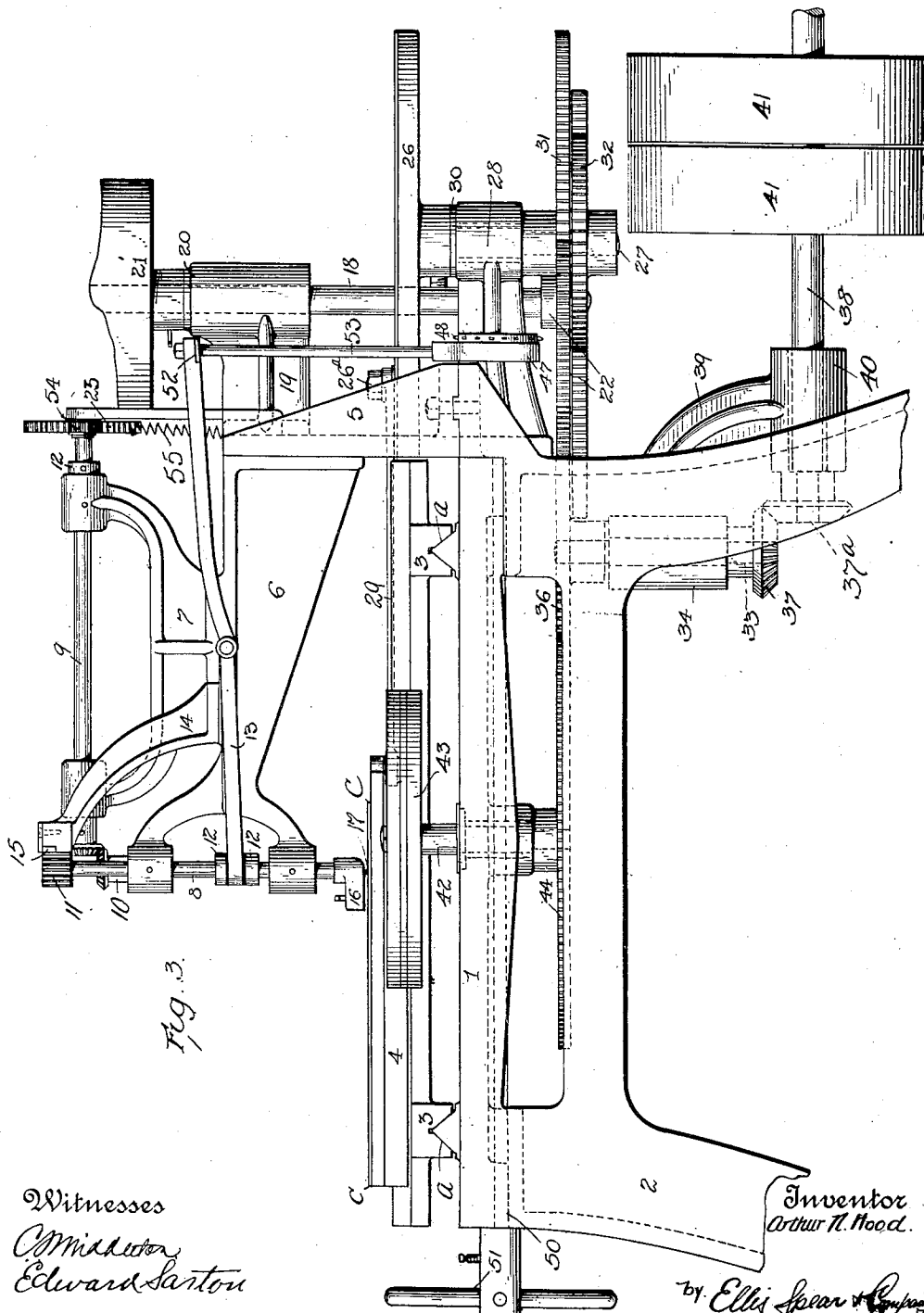
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

ARTHUR N. HOOD, OF BOSTON, MASSACHUSETTS.

MACHINE FOR CUTTING OUT RUBBER SOLES OR SIMILAR ARTICLES.

No. 835,430.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed January 18, 1904. Serial No. 189,479.

To all whom it may concern:

Be it known that I, ARTHUR N. HOOD, a citizen of the United States, residing at Boston, Massachusetts, have invented certain new and useful Improvements in Machines for Cutting Out Rubber Soles or Similar Articles, of which the following is a specification.

My invention herein described is embodied in a machine for cutting rubber soles for boots or shoes from a sheet of material prepared for that purpose. The principle of construction permits the application of the machine to the cutting of a single sole or multiple soles from the same sheet by one operation, and one set of mechanism moves the sheet to the knife or knives, while another set moves the knife or knives to keep it or them always parallel with the line of movement of the sheet.

The general features of the invention and the details thereof are set forth in the specification and indicated in the claim appended thereto and are illustrated in the accompanying drawings, in which—

Figure 1 is a front view, partly in section, of a machine embodying my invention. Fig. 2 is a plan view of the invention, and Fig. 3 is a side elevation of the invention.

In the drawings, which show the embodiment of my invention, the numeral 1 indicates the bed of the machine, which is supported upon legs 2. Upon this bed are parallel guideways *a a*, on which moves the lower sliding plate 3. This carries parallel guideways *b b*, arranged at right angles to the ways *a a*, and on the ways *b b* moves the upper sliding plate 4. The lower plate 3 is reciprocated by means of a cam 43, to which it is connected by a link 45 and intermediate link 46. These parts are shown in front elevation in Fig. 1 and more clearly in plan in Fig. 2. Link 46 is pivoted on the bed, and its free end is pivoted to the free end of link 45, which latter is pivoted to the plate 3, and at the junction of the links a pin connects them with the path of the cam, (shown at 43^a.) The cam-wheel 43 is fixed on a shaft 42, which has its bearing in the bed and carries on its lower end a gear-wheel 44, in mesh with the main driving-gear 36 on the upper end of a shaft supported in bracket 34. This shaft is driven through bevel-gears 37 and 37^a by the main driving-shaft 38, which bears in bracket 39 and has pulleys 41 41. The cam-path is made to conform to the lateral movement required by the shape of the sole to be cut and

operates in connection with a crank which gives the movement longitudinally of the sole, the combined movements determining the precise path of the material to the knife or knives.

Driving-gear 36 (see Fig. 3) is in mesh with a gear-wheel 31, fixed on vertical shaft 27, turning in bushing 30 in supporting-brackets 28. On the upper end of shaft 27 is fixed a crank-wheel 26, to which is connected by a crank-pin the rod 29, also connected with and transmitting longitudinal reciprocating motion to the upper plate 4. The position of the crank-pin and consequent movement of the plate are determined by the length of the sole to be cut.

As plate 4 moves upon plate 3 and in direction transverse to that of plate 3, and simultaneously therewith the sheet of rubber carried on the upper surface of plate 4 will have a movement the resultant of these two movements, and the shape of the cam-path 43^a and its adjustment to the movement given the upper plate by the crank-pin 26^a will determine the line of movement of the sheet coincident with the shape of the sole.

The knives occupy stationary positions, but must be turned to maintain tangential position relative to the sole at every point in the progress of the sheet.

While, as before intimated, one knife may be used alone, it is a great advantage of my invention that several at once may be used as well, and such multiple knives are shown herein. They are indicated at 17 fixed to holders 16, secured to the lower ends of spindles 8. These spindles are vertically movable in bearings on a bracket 6, fixed to a support 5, fixed upon the bed. The spindles turn also in their supports and have splined on the upper ends of each a pinion 11, all of which are in mesh and properly connected with a rack-bar 15, arranged to slide and reciprocate in bearings, so that when one of the spindles is turned all turn with it with the same motion and to the same extent. Proper motion is imparted to one of the spindles by means of a bevel-gear 10, splined thereon, which is turned by a companion gear on the shaft 9. This shaft is mounted in brackets, as shown in Fig. 3. On its rear end it carries a pinion 54 and is turned by a segment-lever 23, meshing with 54 and pivoted on a suitable support, as shown in Fig. 2. The free end of the segment-lever rests on and is moved by a cam 21, mounted on a

shaft 18. This cam-shaft is mounted in bearings, as shown in Fig. 3, with a bushing 20 and has fixed on its lower end a gear 22, in mesh with gear 32 on the shaft 27, whereby it is driven simultaneously with the other mechanisms hereinbefore described. The free end of the segment-lever is held to its cam by means of a spring 55, and the parts are so adjusted in connection with the shape of the face of cam 21 that the knife is always kept in position tangential to the edge of the sole in process of cutting and in exact imitation with the process of hand cutting.

The knife may be set at any desired angle. The sole sheets or sheet of rubber from which the soles are to be cut lies on the upper plate, as indicated at *c c*. The machine either by hand or by any suitable mechanism is made to stop and start at a desired point and in its motion the sheet is moved against the lowered knives, each of which cuts a sole of the same size and shape and by one movement of the machine, the direction of movement being indicated by the arrows.

In order that the knives may be raised when the cut is completed and lowered on a fresh sheet, I have provided levers 13, pivoted to the brackets and engaging with collars fixed on the spindle 8 and extending back to a connecting-bar 52, which is pulled down to raise the spindles by means of a rod 53, which is strapped to an eccentric 47 on a shaft 50, Figs. 1 and 3, operated by a hand-wheel 51 or by any suitable connections with the main driving mechanism.

I claim as my invention—

1. In a machine for cutting rubber shoe-blanks from rubber sheets, a plate for supporting the sheet, a cutting-blade pivoted on an axis perpendicular to the plane of the sheet, one of said elements being relatively stationary to the other, means for moving said other element with relation to the first to effect the severance of the blank from the sheet while the cutting-blade is held constantly in contact with the supporting-plate, and means for turning the blade on its axis to maintain its cutting edge tangential to the edge of the blank as the cutting progresses, substantially as described.

2. In a machine for cutting rubber shoe-blanks from rubber sheets, a movable plate for supporting the sheet, a relatively stationary cutting-blade pivoted on an axis perpendicularly to the plane of the sheet with means for maintaining it constantly in contact with the plate during the cutting action, and means for moving the plate to cause the cutting-blade to sever the blank from the sheet, said means including a changeable cam whereby blanks of different shapes may be cut by the same machine, substantially as described.

3. In a machine for cutting rubber shoe-

blanks from rubber sheets, a movable plate for supporting the sheet, a relatively stationary cutting-blade pivoted on an axis perpendicular to the supporting-plate, the edge of the cutter acting through the sheet against the plate to sever the blank, means for moving the plate to cause the cutting-blade to sever the blank from the sheet, and means for turning the blade on its axis to keep its cutting edge tangential to the edge of the blank as the cutting progresses, substantially as described.

4. In a machine for cutting rubber shoe-blanks from rubber sheets, a movable plate for supporting the sheet, a plurality of cutting-blades arranged above said plate and relatively stationary thereto and having their edges bearing against the plate during the cutting action to sever the blank, means including a changeable cam for moving said plate in a horizontal plane, and means for simultaneously turning said knives to maintain the cutting edge tangential to the edge of the blanks as the cutting progresses, substantially as described.

5. In combination, a plate for supporting the blank to be operated upon with means for imparting a compound reciprocating motion thereto, a plurality of blade-carrying spindles rotatably mounted above said plate, a single rack meshing with gears carried by said spindles and operating connections therefor, substantially as described.

6. In combination, a plate for supporting the blank to be operated on, with means for imparting a compound reciprocating motion thereto, a plurality of spindles located above said plate and adapted to cut through the material supported thereby, connections between said spindles whereby they are rotated in unison, a cam having operating connections to one of said spindles, and means for rotating said cam in unison with the movement of the supporting-plate, substantially as described.

7. In combination, a plate for supporting the material to be operated on, with means for moving the same, a plurality of knife-carrying spindles arranged in line above said plate, gears carried on the upper ends of said spindles, a rack meshing with all of said gears, a rocking lever having connections with one of said spindles whereby the rocking of the lever rotates said spindle and a cam bearing against the other end of the lever with means for operating the cam in unison with the movement of the supporting-plate, substantially as described.

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

ARTHUR N. HOOD.

Witnesses:

ROBERT L. RICE,
CATHERINE A. ROCHE.