

1,348,976.

I. ANTMAN.
MACHINE FOR MEASURING AND CUTTING RIBBON.
APPLICATION FILED SEPT. 5, 1919.

Patented Aug. 10, 1920.
2 SHEETS—SHEET 1.

Fig. 1.

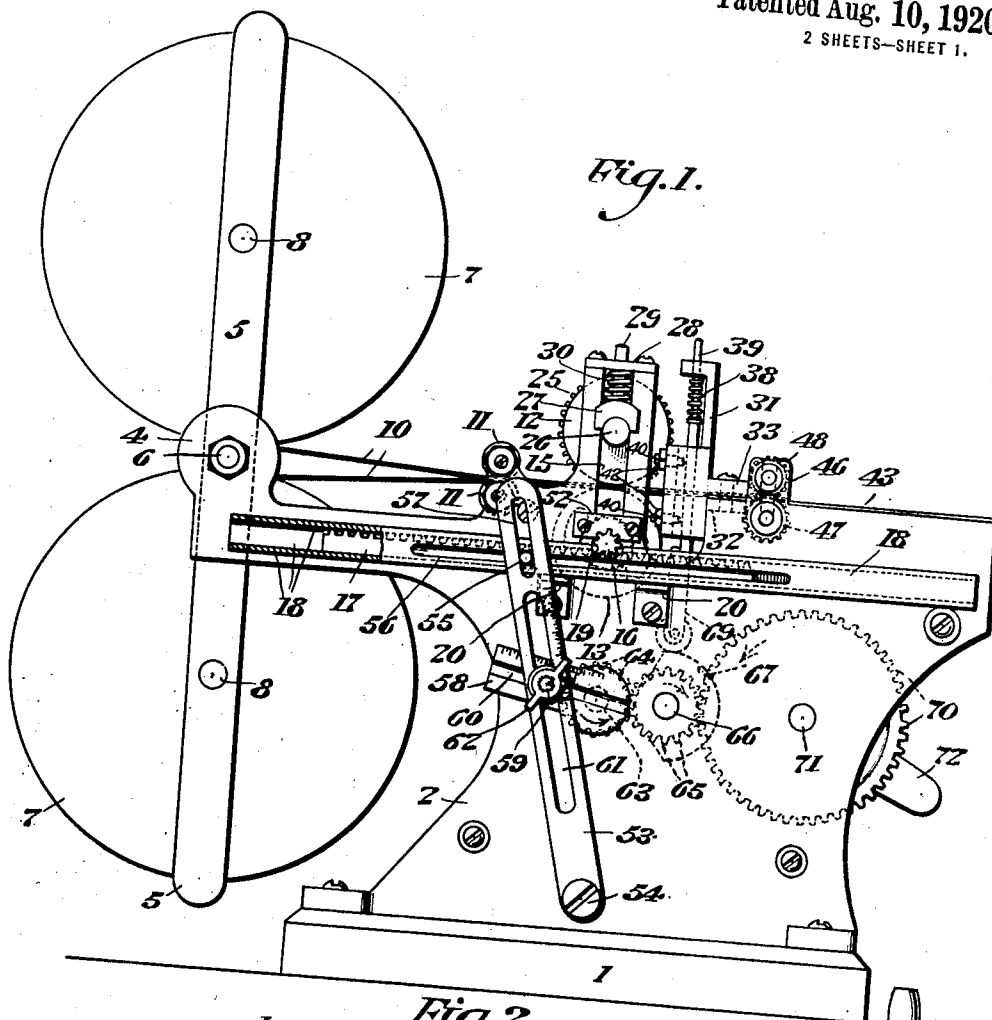
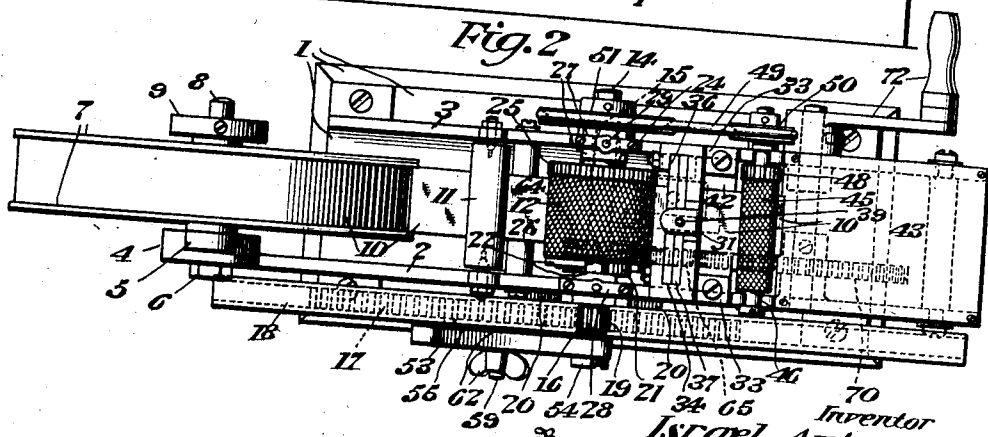


Fig. 2.



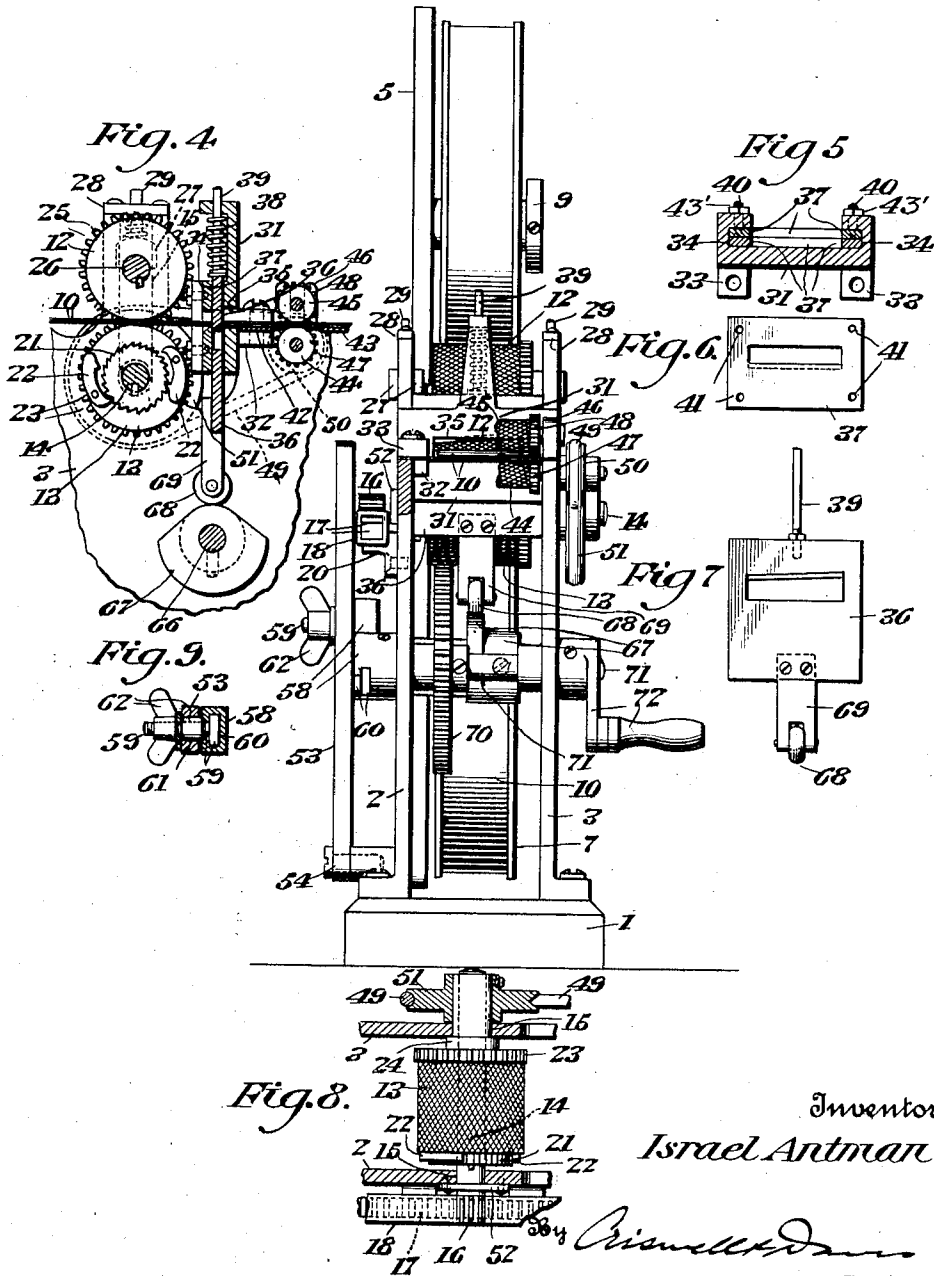
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Fig. 3.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR MEASURING AND CUTTING RIBBON.

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Specification of Letters Patent. Patented Aug. 10, 1920.

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To all whom it may concern:

Be it known that I, ISRAEL ANTMAN, a citizen of the United States, and resident of the borough of Bronx, county of New York, city and State of New York, have invented certain new and useful Improvements in Machines for Measuring and Cutting Ribbon, of which the following is a specification.

This invention relates to improvements in ribbon-cutting machines, and more particularly to machines for cutting a continuous web of ribbon into strips of equal length.

The invention has for its objects the provision of a simple and inexpensive machine adapted to advance a continuous web of ribbon step by step and automatically cut off strips thereof of equal length; to provide improved means for mounting and driving the feeding rolls whereby the rolls may be readily removed; to provide improved cutting mechanism bodily removable from the machine; to provide cutting mechanism embodying a fixed knife and a movable knife and means for supporting the same so constructed that either or both knives may be readily removed for sharpening or substitution of new knives; and to provide simple and durable means for feeding one or more webs of ribbon past the cutting mechanism step by step, the feeding means being adjustable to vary the distance the ribbon is fed.

In the drawings, Figure 1 is a side elevation of the machine;

Fig. 2 a plan view;

Fig. 3 an end elevation looking toward the left of the machine as shown in Fig. 1;

Fig. 4 a fragmentary vertical longitudinal sectional view;

Fig. 5 a horizontal sectional view showing the means for supporting and guiding the knives;

Figs. 6 and 7 detail views showing the fixed and movable knives, respectively;

Fig. 8 a detail view showing the lower roll 13 and its shaft with the parts mounted thereon; and

Fig. 9 a detail view showing the means for varying the throw of the rack operating crank.

The frame of the machine comprises a base 1 upon which two parallel upright frame plates 2 and 3 are rigidly mounted.

The side plate 2 of the frame is provided with an extension or arm formed with a

boss 4 having a vertical channel in which a ribbon reel supporting bar 5 is rigidly held by means of a bolt 6. In order to increase the capacity of the machine, the bar 5 is made of sufficient length to support two ribbon reels 7 one above the other. The reels 7 are rotatable about stub shafts 8 held to bar 5 and are removably held on said shafts by collars 9 which are locked in place by suitable set screws, as shown in Figs. 1 and 2. Suitable spacing washers may be placed on each shaft 8 between the sides of reel 7 and the bar 5 and collar 9, as shown in Figs. 2 and 3.

The two superimposed webs of ribbon are drawn from the reels 7 by the main feed rolls 12 and 13 between a pair of idle guiding rolls 11 rotatably supported at their ends on suitable bearing screws threaded through the frame plates 2 and 3. The feed rolls 12 and 13 are preferably formed of vulcanized fiber and provided with knurled gripping surfaces. Either or both feed rolls may, however, be formed of steel if desired. The roll 13 is loosely mounted on a shaft 14 rotatably supported at the bottom of vertical slots 15 in the frame plates 2 and 3. Shaft 14 has a pinion 16 fixed on one end thereof, which meshes with a rack 17 slidably confined in a hollow rectangular casing or guideway 18 the upper part of which, adjacent pinion 16, is cut away at 19 to permit the pinion to mesh with the teeth of the rack. The casing or rack guide 18 is rigidly held to brackets 20 secured to the frame plate 2.

A ratchet wheel 21 keyed on shaft 14 at one end of roll 13 is adapted to intermittently rotate said roll through the medium of pawls 22 pivotally held to the adjacent end of the roll. A gear 23 loose on shaft 14 is fixed to the opposite end of roll 13 and is provided with a suitable hub or shouldered sleeve 24 the reduced portion of which extends outwardly through slot 15 in plate 3, said shouldered hub 24 serving in connection with the ratchet wheel 21 to prevent lateral movement of the roll. Gear 23 meshes with a gear 25 fixed on one end of feed roll 12 which is keyed on a shaft 26 the ends of which project through the slots 15 in the frame plates. Roll 12 is yieldably held against roll 13 by vertically slidable bearing blocks 27 the sides of which are grooved to receive the edges of the frame plates at each side of slots 15. The upper

ends of slots 15 are closed by removable plates 28, and the bearing blocks 27 are formed with stems or posts 29 which extend through apertures in said plates. Coil springs 30 surround stems 29. It will be obvious that by removing plates 28 and bearing plate 52 the rolls 12 and 13 with their shafts and parts mounted thereon may be readily removed from the frame.

10 The cutting mechanism is mounted in a removable frame 31 held to bosses 32 on the frame plates 2 and 3 by means of suitable screws passing through lugs 33 on the knife frame and threaded into said bosses 32. The knife frame 31 is formed with channels 34 at opposite sides thereof. The face of said frame adjacent the feed rolls 12 and 13 is open while the opposite face thereof is provided with a horizontal slot 35 through which the ribbon passes as it is advanced by the feed rolls. The movable cutting knife 36 is slidably guided in the ways 34 and is normally forced downwardly to carry its cutting edge past the cutting edge of the fixed knife 37 by a coiled spring 38 surrounding a post or stem 39 held to the upper edge of the knife 36 and extending through a lug on the knife frame 31. The fixed knife 37 and movable knife 36 are provided with apertures or slots through which the ribbon passes, the lower edge of the slot in the fixed knife and the upper edge of the slot in the movable knife being beveled to form cutting edges. The fixed knife is held in place by headless screws 40 threaded through the knife frame and having their reduced inner ends engaging in apertures or sockets 41 in the fixed knife. By tightening screws 40 the fixed knife may be forced against the face of the movable knife to take up wear. Suitable lock nuts 43' may be threaded on the outer ends of the screws to lock the fixed knife in its adjusted position. After the ribbon passes the knives it is passed over a plate 42 held to the frame plates 2 and 3 and is then drawn between a pair of knurled rolls 44 and 45 fixed on shafts journaled in slots 46 in frame plates 2 and 3. Meshing pinions 47 and 48 are fixed on the shafts of rolls 44 and 45. The shaft of roll 44 is driven intermittently by a belt 49 passing over a pulley 50 fixed on said shaft and over a pulley 51 fixed on the outer end of the hub 24 of gear 23. The shouldered hub 24 of gear 23 and the hub of pulley 51 engage opposite sides of frame plate 3 and prevent endwise movement of the shaft 14 and parts mounted thereon. A bearing plate 52, removably held to frame plate 2 by suitable screws, may be provided for maintaining pinion 16 in mesh with rack 17.

The rack 17 is reciprocated by a lever 53 pivotally held at its lower end at 54 to the frame plate 2. A pin 55 on rack 17 extends through a horizontal slot 56 in the rack guide 18 and engages in a slot 57 formed in the upper end of lever 53. Lever 53 is vibrated by a crank arm 58 having an adjustable crank pin 59 provided with a square head slidable in an undercut T-shaped channel or way 60 in the crank arm. The pin extends through a slot 61 in lever 53 and is rigidly clamped in its adjusted position to the crank arm by a thumb screw 62 having a reduced sleeve extending loosely through slot 61 in lever 53, said sleeve being slightly longer than the thickness of lever 53 and bearing against the crank arm 58, as clearly shown in Fig. 9. The crank arm may be provided with suitable graduations as shown in Fig. 1 to indicate the effective length of the crank arm. It will be obvious that by adjusting the crank pin the length of the strips cut from the web or webs of ribbon may be varied. The crank arm 58 is fixed on a shaft 63 journaled in the frame plates 2 and 3. A pinion 64 fixed on shaft 63 meshes with a pinion 65 fixed on a cam shaft 66 journaled in the frame plates 2 and 3. A cam 67 fixed on shaft 66 engages a roller 68 journaled in a bearing 69 depending from the lower edge of the movable knife 36. Said cam is adapted to raise the knife 36 against the pressure of spring 38 as the high point of the cam passes under the roller 68, and permits the spring to force the knife 36 downwardly between each step-by-step movement of the web of ribbon and thus sever a strip from the web. The pinion 65 on the cam shaft meshes with a large gear 70 fixed on a shaft 71 journaled in the frame plates 2 and 3. Shaft 71 is adapted to be rotated manually by a crank handle 72 fixed on one end thereof. The feed rolls 44 and 45 serve to deliver the severed strips of ribbon upon the table 43 and also serve in conjunction with feed rolls 12 and 13 to hold the ribbon taut during the cutting operation.

What I claim is:

1. In a machine of the class set forth, the combination of a frame, a lever pivotally held at one end to the frame, a crank shaft journaled in the frame, a crank arm held to said crank shaft, a crank pin adjustably held to the crank arm and engaging in a longitudinal slot in said lever, a rack, means on the frame for guiding the rack, means forming a pin and slot connection between the rack and the free end of the lever, a feed roll shaft journaled in the frame, a pinion fixed on the feed roll shaft meshing with the rack, a feed roll loosely mounted on the feed roll shaft, a ratchet wheel fixed on the feed roll shaft adjacent one end of the feed roll, a pawl pivotally held to the end of said feed roll and engaging the teeth of the ratchet wheel, a second feed roll journaled in the frame and cooperating with the first

mentioned feed roll, meshing gears fixed to said feed rolls, a fixed knife supported in the frame, a movable knife, a spring normally tending to force the cutting edge of the movable knife past the cutting edge of the fixed knife, a cam shaft journaled in the frame, a cam fixed on the cam shaft adapted to shift the movable knife against the pressure of its spring, meshing gears fixed on the cam shaft and crank shaft, and means for rotating the cam shaft.

2. In a machine of the class set forth, the combination of a main frame, a reel rotatably supported on the frame, a knife supporting and guiding frame removably held to the main frame, a movable knife slidably held in said knife frame, a fixed knife removably held in the knife frame, two pairs of feed rolls located at opposite sides of the knife frame, automatically operated means for intermittently rotating said pairs of feed rolls in unison to feed predetermined lengths of a web from the reel past the knives, and means for automatically reciprocating the movable knife once during each period of stoppage of the feed rolls.

3. In a machine of the class set forth, the combination of a frame, a knife support on said frame, a fixed knife in said frame having a slot therein one edge of which is beveled, a movable knife slidably held in said support against one face of the fixed knife and having a slot therein one edge of which

is beveled, spring means normally tending to shift the movable knife to carry its beveled edge past the beveled edge of the fixed knife, means for intermittently shifting the movable knife to bring the slots in the knives in register, and means driven from said knife shifting means for automatically feeding a predetermined length of material through the slots in the knives while the slots are in register.

4. In a machine of the class set forth, the combination of a frame, a knife support on said frame, a fixed knife in said frame having a slot therein one edge of which is beveled, a movable knife slidably held in said support against one face of the fixed knife and having a slot therein one edge of which is beveled, spring means engaging the movable knife for shifting the same to carry its beveled edge past the beveled edge of the fixed knife, means for intermittently shifting the movable knife to bring the slots in the knives in register, two pairs of feed rolls journaled in the frame at opposite sides of the knife support, and automatically operating means for simultaneously rotating the rolls of each pair in opposite directions while the slots in the knives are in register to feed a predetermined length of material through the slots in said knives.

This specification signed this 2d day of September, A. D. 1919.

ISRAEL ANTMAN.