E. A. & W. L. HAMILTON.

VENDING MACHINE.

APPLICATION FILED APR. 4, 1914.

1,133,640.

Patented Mar. 30, 1915.

2 SHEETS—SHEET 1.

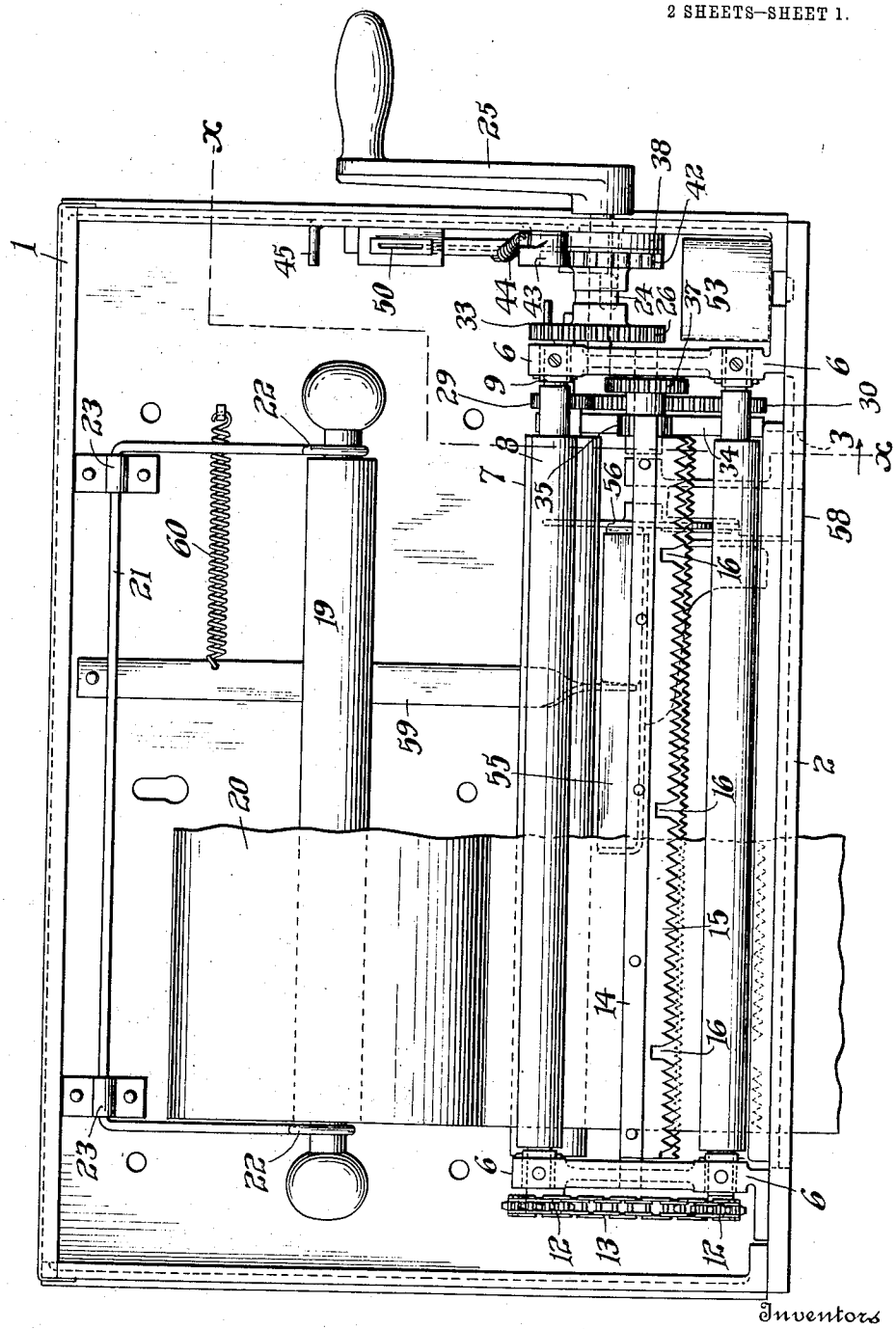


FIG. 1.

Witnesses

Daniel Webster, Jr.

E. W. Smith.

Inventors

Ernest A. Hamilton and

Walter L. Hamilton

By

Attorney

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2 SHEETS—SHEET 2.

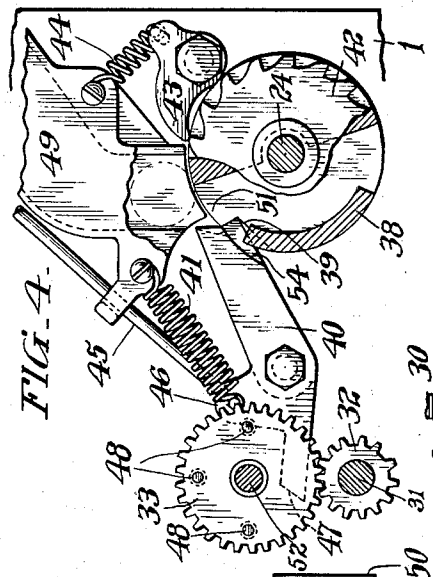


FIG. 4.

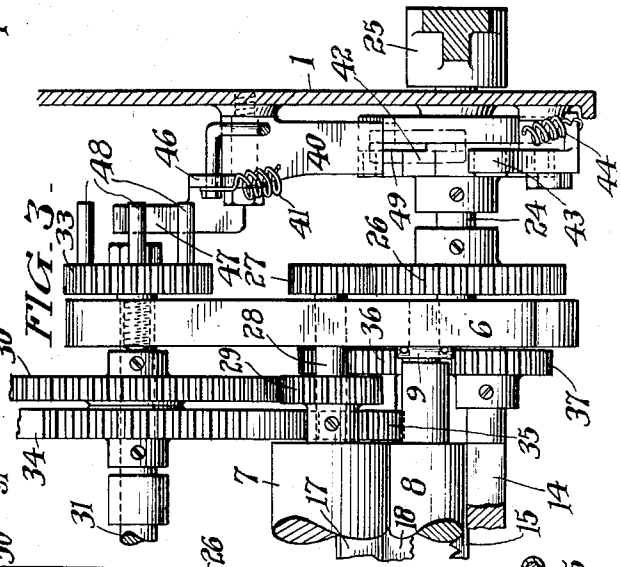


FIG. 3.

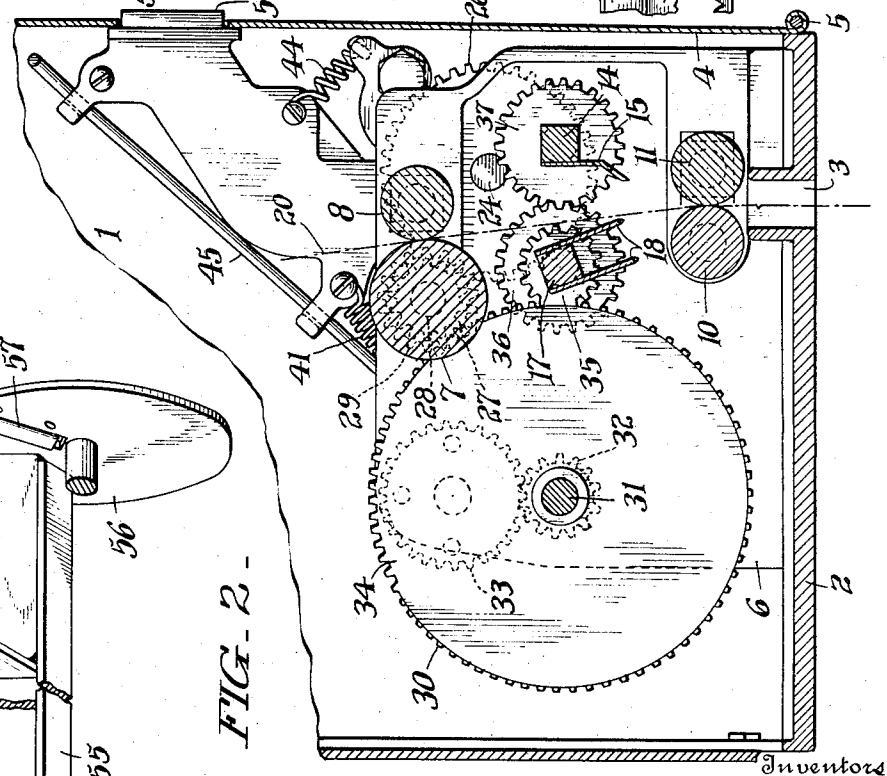


FIG. 2.

FIG. 5.

Witnesses

Daniel Webster, Jr.

E. W. Smith.

Inventors

Ernest A. Hamilton

Walter L. Hamilton

By

Attorneys

UNITED STATES PATENT OFFICE.

ERNEST A. HAMILTON, OF PHILADELPHIA, PENNSYLVANIA, AND WALTER LOOMIS HAMILTON, OF HOLYOKE, MASSACHUSETTS.

VENDING-MACHINE.

1,133,640. Specification of Letters Patent. Patented Mar. 30, 1915.

Application filed April 4, 1914. Serial No. 829,466.

To all whom it may concern:

Be it known that we, ERNEST A. HAMILTON and WALTER LOOMIS HAMILTON, citizens of the United States, and residents, respectively, of Philadelphia, county of Philadelphia and State of Pennsylvania, and Holyoke, county of Hampden, State of Massachusetts, have invented an Improvement in Vending-Machines, of which the following is a specification.

The present invention relates to vending machines for material such as paper toweling or the like, and has reference more particularly to an improvement upon the construction shown in the patent to W. L. Hamilton, No. 1,053,912, granted February 18, 1913.

The invention has for an object to provide a mechanism adapted to deliver a predetermined length of the material from the machine, and automatically sever or partly sever the said material into the aforesaid predetermined lengths which correspond to suitable towel sizes.

It has for a further object to provide an automatic timing mechanism for controlling the actuation of the material delivery and severing mechanism which permits free operation of the machine for a definite length of time and automatically locks the operation at the expiration of the aforesaid time.

It has as a further object to provide as a component part of the operating mechanism a soap dispensing device whereby a suitable quantity of soap is delivered from the machine as each length of material is discharged therefrom.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating our invention, we have shown in the accompanying drawings one form thereof which is at present preferred by us, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which our invention consists can be variously arranged and organized and that our invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a front elevation of the machine with the door open to show the interior mechanism; Fig. 2 represents a section on line x—x of Fig. 1, the upper portion of the machine, however, being omitted for convenience; Fig. 3 represents a plan of the control mechanism and the driving mechanism; Fig. 4 represents a detail in side elevation of the control mechanism embodying both a manual and coin control; Fig. 5 represents a detail of the soap dispensing mechanism.

1 designates the main casing of the machine having a bottom 2 of a substantial material, provided with a slot 3 which serves to permit the discharge of the contents of the machine at the proper time.

4 designates the door for the casing which is preferably of a size to close the entire front of the casing, and it is preferably hinged as shown at 5 to the bottom so that it may be lowered and give free access to the parts of the mechanism within the casing.

6 designates a pair of brackets fixed to the bottom of the machine and suitably spaced apart to receive the material feed rolls 7 and 8 which are journaled at their ends in the respective brackets 6. The roll 8 is preferably mounted in suitable spring pressed bearings 9 in order to yield during the feeding action and permit the free movement of the material. The feed roller 7 is the driven roller while the roller 8 is an idle roller in contact therewith and receives its movement by frictional contact with the roller 7 or through the interposed material.

10 and 11 designate respectively rollers journaled in the brackets 6 beneath the pair of rollers just described, the former being driven in the present instance from the roller 7 by means of sprockets 12 and chain 13 and transmitting its movement to the roller 11 by frictional engagement, the latter being an idle roller and mounted in a similar manner to the roller 8. Between the aforesaid pairs of rollers there is a rotatable member 14 journaled in the brackets 6 and carrying thereon a toothed cutting blade 15, the teeth of which are substantially radially disposed and except for the omission of a tooth or teeth, as indicated at 16, extend continuously for a distance corresponding to the length of the adjacent rollers 7 or 10 or a sufficient distance with respect to the width of the material dispensed by the machine to insure the said material being properly sev-

cred. 17 designates a second rotatable member journaled in the brackets 6 and located adjacent the member 14 with which it is arranged in parallel relation. This latter member 17 carries a pair of blades 18 suitably spaced apart and each preferably having an edge provided with gripping teeth to engage the material as it passes between the members 14 and 17. A pocket or groove is thus formed into which the cutting blade 15 is adapted to fit at the proper time in the operation and thus sever or partially sever the material.

19 designates a suitable mandrel, preferably rectangular, for supporting the roll of material 20, the said mandrel being removably mounted in the casing by means of the hanger 21 which, as here represented, is substantially U-shaped and terminates in a hook 22 at each end adapted to receive the projecting ends of the mandrel. This hanger 21 is hinged or journaled in suitable bearings 23 attached to the casing 1, as will be apparent.

The material, which in the present case is a roll of paper toweling, is adapted to be passed through the feed rolls 7 and 8, thence between the two rotatable members 14 and 17 and between the lower rollers 10 and 11 from which it is discharged by way of the slot 3 to the outside of the machine. The actuation and feeding of the material is preferably accomplished by a mechanism which operates at a certain time to cause the material to be unreeled and fed through the pairs of rollers, and at the same time is controlled or regulated in such a manner that a definite length of material is delivered from the machine at one operation thereof. The mechanism for carrying out the above mentioned step preferably consists as follows: 24 designates the main driving shaft of the machine journaled between one of the brackets 6 and the casing 1 and carrying on its outer end the operating lever or crank 25. To this shaft there is keyed or otherwise secured a gear 26, meshing with a pinion 27 keyed to the end of the shaft 28 of the feed roller 7, and by which the latter is continuously rotated during the actuation of the lever or crank 25. The motion of the shaft 28 is in turn transmitted by a pinion 29 to a gear 30 on a countershaft 31, suitably journaled, and carrying a pinion 32 which drives the timing gear 33, which is mounted on the stud shaft 52 and will later be described. Adjacent the gear 30 the counter shaft 31 carries a mutilated or intermittent gear 34 in mesh with a similar type of pinion 35 fixed to the member 17 so that the latter is intermittently actuated to operate the severing mechanism at certain times only. This intermittent movement of the member 17 is transmitted to the member 14 by a pair of gears 36 and 37, as will be understood by reference to Fig. 2. It will thus be apparent that unless means are provided for controlling the actuation of the crank 25, a continuous movement thereof is possible which will cause both the upper and lower pairs of feed rollers to rotate and feed the material, while at the same time the intermittent mechanism will cause the actuation of the cutting mechanism and consequent severing of the paper into lengths. The crank 26 is, however, preferably controlled by a mechanism which not only locks the crank at certain times, but also positively governs the number of revolutions made by the crank between the time the lock is released and when it again becomes effective. This control mechanism, in the preferred form, comprises a disk 38 fixed to the shaft 24 and provided with a notched portion 39 which forms a seat for a pivoted tumbler or latch 40 normally held in contact with the periphery of the disk 38, by means of the spring 41. The function of this tumbler is to seat in the notch 39 and lock the disk against movement at the proper time. 42 designates a ratchet wheel fixed to the disk 38 and controlled by the pivoted pawl 43 which is actuated by the spring 44 to prevent the shaft 24 from movement in the opposite direction. In order to release the disk 38 so that the shaft 24 may be rotated we have provided one form of mechanism comprising the push-rod 45 fixed at one end to a lug 46, preferably formed integral with the tumbler 40 and located on the opposite side of the pivot from the main portion of the tumbler. Thus by depressing the rod 45 the tumbler 40 will swing upon its pivot against the tension of the spring 41 and be withdrawn from the notch 39, thereby releasing the parts controlled by the disk. As it is desirable to unreel a substantial quantity of the material at one operation, we have provided a means for automatically preventing the tumbler returning to locking engagement with the disk at the end of each revolution of the shaft 24, this construction embodying in the preferred form a finger 47 formed as an extension of the tumbler 40 and projecting into the path of movement of a pin or pins 48 carried by the gear 33. Thus, when the tumbler 40 is released, and one revolution of the disk 38 brings the notch 39 back to its initial position, one of the pins 48 will contact with the finger 47 and again withdraw the tumbler out of the path of the notch, thereby permitting the disk to continue to rotate. In the present instance, we have shown three pins upon the gear 33 so that the disk 38 may make four revolutions before it is automatically locked by the return of the tumbler 40 to locking position, and during these four revolutions of the driving shaft 24, a length of material equal to two towel lengths is discharged

from the machine. While this operation is in progress, the severing devices have made two revolutions through the action of the intermittent gearing, thus not only severing or puncturing the desired length of material, but also puncturing it intermediate its length so that two towels of equal length are discharged.

If desired the release of the crank shaft 24 may be accomplished by means of a coin-controlled mechanism consisting of a coin chute 49 having the inlet slot 50 projecting through the casing at a suitable point such as through the door 4, and its lower end terminating adjacent the circumference of the disk 38. In this form of the device the disk 38 is provided with a slot 51 into which the coin is adapted to seat and where it is held until the disk has been rotated to bring the slot 51 to its lowermost position when the coin may drop by gravity into the receptacle 53 provided for the purpose. It will further be noted that the coin is supported in and projects from the slot 51 in order to contact with the end of the tumbler 40 and thus force the latter out of locking engagement with the disk so that the crank shaft may be rotated. Preferably the tumbler is provided with a cut-away portion 54 into which the coin is received to afford proper actuation of the parts. Attention is directed further to the first position of the coin when it is placed into the chute 49 as it initially assumes a position upon the periphery of the disk 38 adjacent the slot 51 and in order to bring the latter into alinement with the coin the crank must be turned slightly in the reverse direction to allow the coin to properly seat, after which the crank may be operated in the proper direction to actuate the parts. This reverse movement of the crank is made possible by providing sufficient play or backlash in the crank shaft which is effected by so locating the latch opening 39 as to stop the disk 38 with the pawl 43 raised out of the ratchet wheel and normally resting as shown in Fig. 4.

55 designates a guide trough or receptacle for soap suitably mounted on the main casing and having the open end thereof located adjacent a rotary cutter 56 carried by the counter-shaft 31. This cutter 56 is preferably radially apertured adjacent the blade 57 so that as the successive pieces of soap are cut off they will drop on the opposite side of the cutter from the trough 55 and be discharged through a suitable opening 58 in the bottom of the casing. The soap is normally pressed against the cutter 56 by a follower 59, here shown as pivoted to the rear wall of the casing and actuated by the spring 60 which tends to maintain the proper pressure of the soap upon the cutter.

In the operation of the machine a roll of material is placed in position upon the hanger hooks 22 and the weight thereof is sufficient to cause the necessary friction with the rear wall of the casing so that the material is not unreeled too freely from the mandrel. The material is then passed between the rolls 7 and 8, thence between the two rotatable members 14 and 17 carrying the severing devices, then through the lower rolls 10 and 11 and its end is finally inserted in the discharge slot 3. The machine is now ready to deliver a predetermined length of the material which is suitably severed or perforated in order that the desired length may be readily detached. To release the operating mechanism the tumbler 40 is withdrawn from the locking notch 39 by the operation of the devices controlling this member, and the crank 25 may then be turned to actuate the two sets of feed rolls between which the paper is fed. In this connection it will be noted that preferably the lower set of rolls 10 and 11 are so geared with respect to the main rolls 7 and 8 as to run at a somewhat greater speed in order to produce a slight tension of the material between the two sets of rolls, thus preventing the material looping or folding between these points and insuring the cutting devices operating in a proper manner. In our present arrangement of the mechanism we have so designed the gearing for the severing device that it is actuated intermittently and makes but one revolution for every two revolutions of the crank shaft 24, though it will be understood that we do not wish to be limited to this particular timing of the cutters, as obviously they may be arranged to come into operation at any time desired. Furthermore it will be noted that the driving means for the severing device actuates these parts at a speed slightly greater than the surface speed of the upper pair of feed rollers 7 and 8 so that whenever the severing device comes into operation it will have a tendency to draw the material taut and thus more readily and accurately cut the material. In addition, the holding portion of the severing device, comprising the spaced apart blades with the small teeth, serves as an efficient retaining means for preventing the material being pushed away from the cutting blade when the latter engages it at the proper time.

In the manner which we have here preferred, a length of material corresponding to a desired towel length will be discharged from the machine by two revolutions of the crank shaft and partially severed from the body of the material by the action of the cutter, and may readily be torn off since it is merely held by the tacks or strips of material caused by the omission of the teeth at the points 16. This length of material is followed by another length which is similarly partially severed so that two towels

are delivered by four revolutions of the crank arm before the latter is again locked by the tumbler 40 dropping into place. After the tumbler 40 has been initially released by the controlling mechanism therefor, it is automatically held out of latching engagement with the disk 38 through the medium of the pins 48, which successively strike the extension 47 at the end of each revolution of the crank arm, and thus permit the free continued movement of the disk 38. In connection with the severing device, it will be noted that the two members 18 which are spaced apart do not exert any severing action upon the material, but merely form a pocket across which the material is stretched and into which the cutting teeth 15 enter as the two members 14 and 17 are simultaneously rotated. Furthermore, the action of the severing device upon the material is preferably not such as to completely cut off a length of material, but leaves a portion of the material retained as an integral part by the tacks or strips of material left at intervals where the cutting teeth are omitted.

It will now be apparent that we have devised a novel and useful construction which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while we have in the present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described our invention, what we claim and desire to protect by Letters Patent is:—

1. In a device of the character stated, a casing, a supply of material therein, a feeding mechanism for said material, a severing device for cutting said material, means for actuating said feeding mechanism and said severing device, a locking mechanism normally preventing operation of said actuating means, means to release said locking mechanism, and means intermittently operated by said actuating mechanism for rendering said locking mechanism, when released, inoperative for a predetermined interval.

2. In a device of the character stated, a casing, a supply of material therein, a feeding mechanism for said material, a severing device for cutting said material, means for actuating said feeding mechanism and said severing device, a locking mechanism normally preventing operation of said actuating means, means to release said locking mechanism, and means intermittently operated by said actuating mechanism for intermittently engaging said locking mechanism, when released, for rendering the latter mechanism inoperative for a predetermined time.

3. In a device of the character stated, a casing, a supply of material therein, a feeding mechanism for said material, a severing device for cutting said material, means for actuating said feeding mechanism and said severing device, a locking mechanism normally preventing operation of said actuating means, means to release said locking mechanism, a rotatable member operable by said actuating means adjacent said locking mechanism, and means carried by said rotatable member for engaging said locking mechanism, when the latter is released to render said locking mechanism inoperative for a predetermined interval.

4. In a device of the character stated, a casing, a supply of material therein, a feeding mechanism for said material, a severing device for cutting said material, a main operating shaft, a member rotatable therewith provided with an abutment, actuating means controlled by said shaft for operating said feeding mechanism and said severing device, a latch member normally engaging said abutment to lock said shaft against movement, means to release said latch member, and means controlled by said actuating means for rendering said latch member, when released, inoperative for a predetermined interval.

5. In a device of the character stated, a casing, a supply of material therein, a feeding mechanism for said material, a severing device for cutting said material, a main operating shaft, a member rotatable therewith provided with an abutment, actuating means controlled by said shaft for operating said feeding mechanism and said severing device, a latch member normally engaging said abutment to lock said shaft against movement, means to release said latch member, a rotatable member operated by said actuating means, and means carried by said rotatable member for engaging said latch member, when released, after each revolution of said abutment, and for a predetermined number of revolutions.

6. In a device of the character stated, a casing, a supply of material therein, a feeding mechanism for said material, a severing device for cutting said material, a main operating shaft, a member rotatable therewith provided with an abutment, actuating means controlled by said shaft for operating said feeding mechanism and said severing device, a latch member normally engaging said abutment to lock said shaft against movement, means to release said latch member, a rotatable member operated by said actuating means, and a plurality of projections carried by said rotatable member and adapted to

successively engage said latch member when the latter is released, the respective projections coming into operation after each revolution of said abutment, whereby said latch is rendered inoperative for a predetermined number of revolutions of said driving shaft.

7. In a device of the character stated, a casing, a supply of material therein, a feeding mechanism for said material comprising an upper pair of feed rollers and a lower pair of feed rollers, a severing device for cutting said material located between said pairs of rollers, means for actuating said feeding mechanism and said severing device, said means embodying a mechanism for driving said lower pair of feed rollers faster than the upper pair of feed rollers, a locking mechanism normally preventing operation of said actuating means, means to release said locking mechanism, and means operated by said actuating mechanism for rendering said locking mechanism inoperative for a predetermined interval.

8. In a device of the character stated, a casing, a supply of material therein, a feeding mechanism for said material, comprising an upper pair of feed rollers and a lower pair of feed rollers, a severing device for cutting said material located between said pairs of rollers, means for driving said upper pair of feed rollers, and means for respectively rotating said lower pair of feed rollers and said severing device at a greater surface speed than the surface speed of said upper pair of feed rollers.

9. In a device of the character stated, a casing, a supply of material therein, a feeding mechanism for said material comprising an upper pair of feed rollers and a lower pair of feed rollers, cutting edge rollers for cutting said material located between said pairs of rollers, means for respectively actuating said upper pair of feed rollers and said severing device, and means for rotating said lower pair of feed rollers at a greater surface speed than the surface speed of said upper pair of feed rollers.

10. In a device of the character stated, a casing, a supply of material therein, a feeding mechanism for said material comprising an upper pair of feed rollers and a lower pair of feed rollers, a severing device for cutting said material rotatably mounted between said pairs of rollers, means for respectively actuating said upper pair of feed rollers and said lower pair of feed rollers, and means for rotating said severing device at a greater surface speed than the surface speed of said upper pair of feed rollers.

11. In a device of the character stated, a casing, a supply of material therein, a feeding mechanism for said material, means for actuating said feeding mechanism, a pair of rotatable members located adjacent said feeding mechanism, means for respectively rotating said members in opposite directions, a pair of blades secured to one of said rotatable members and suitably spaced apart to form a pocket extending substantially the length of the rotatable member, a plurality of teeth on each blade, a single blade on the remaining rotatable member juxtaposed with respect to each pair of blades and adapted to interfit therewith during the rotation of said members, and a plurality of teeth on said single blade.

12. In a device of the character stated, a casing, a supply of material therein, a feeding mechanism for said material, means for actuating said feeding mechanism, a pair of rotatable members located adjacent said feeding mechanism, a pair of blades secured to one of said rotatable members and suitably spaced apart to form a pocket extending substantially the length of the rotatable member, a plurality of teeth on each blade, a single blade on the remaining rotatable member juxtaposed with respect to said pair of blades and adapted to interfit therewith during the rotation of said members, and a plurality of teeth on said single blade, and means for rotating said blade members in opposite directions intermittently with respect to said feeding mechanism, said means being arranged to bring said rotatable members to rest out of interfitting position whereby said material is freely fed between said blades.

In testimony of which invention, I hereunto set my hand.

ERNEST A. HAMILTON.

Witnesses:
C. H. WISSMANN,
ROBERT M. BARR.

In testimony of which invention, I hereunto set my hand.

WALTER LOOMIS HAMILTON.

Witnesses:
GEORGE W. RITTER,
PATRICK J. GARVEY.