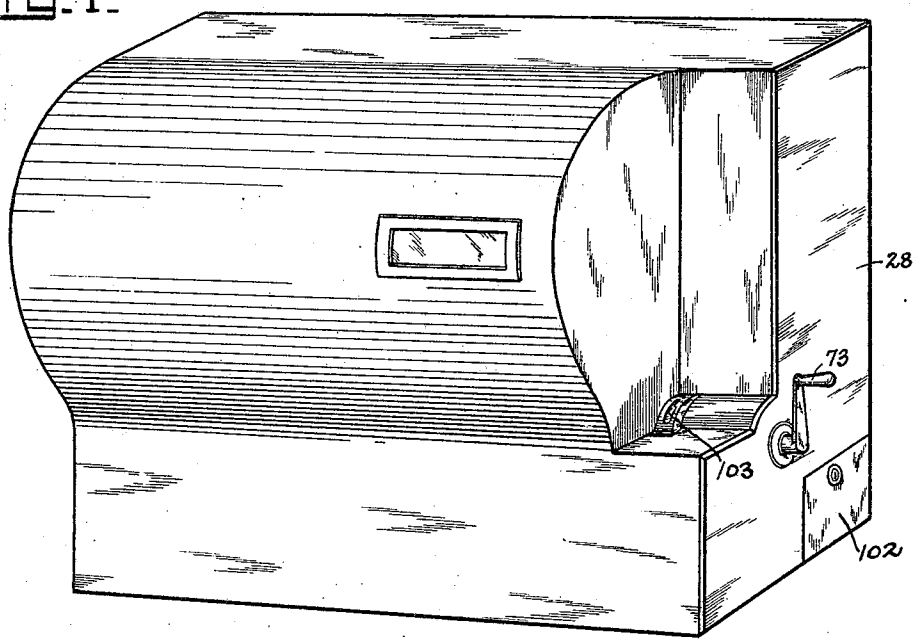
Aug. 6, 1929. A. BOOMERSHINE 1,723,325

DISPENSING MACHINE

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Fig. 1.



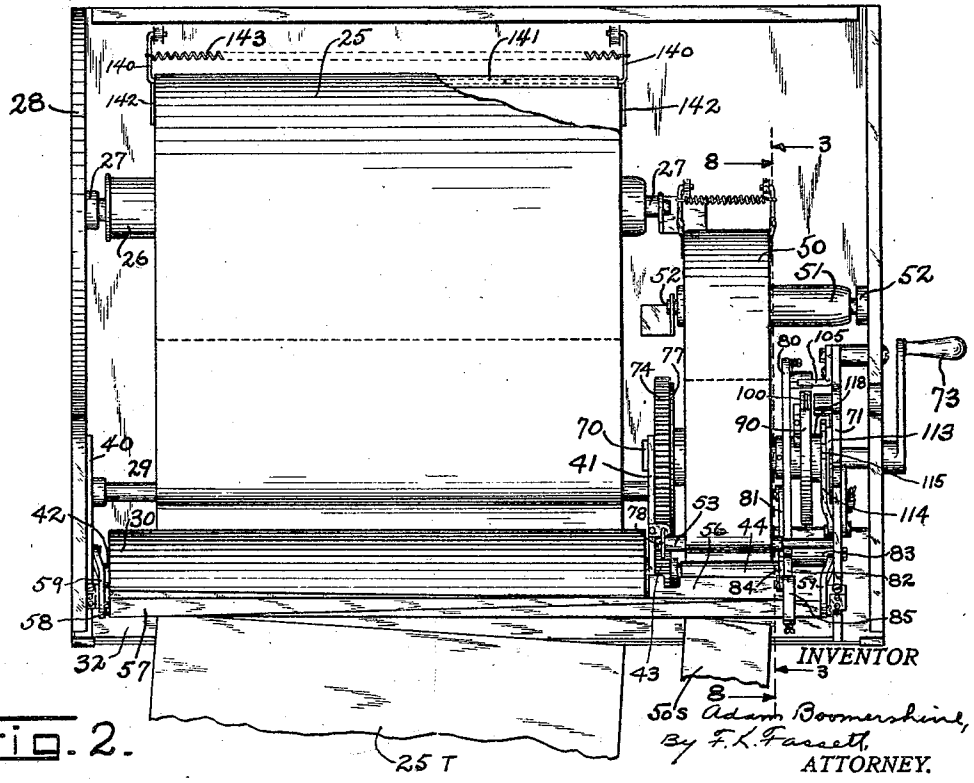


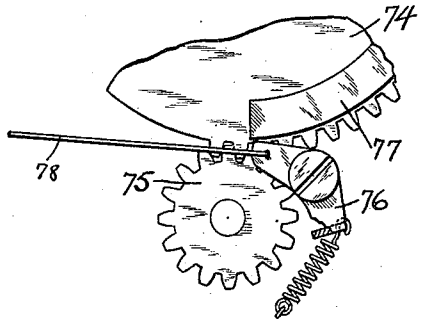
Fig. 2.

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DISPENSING MACHINE

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Fig. 4.



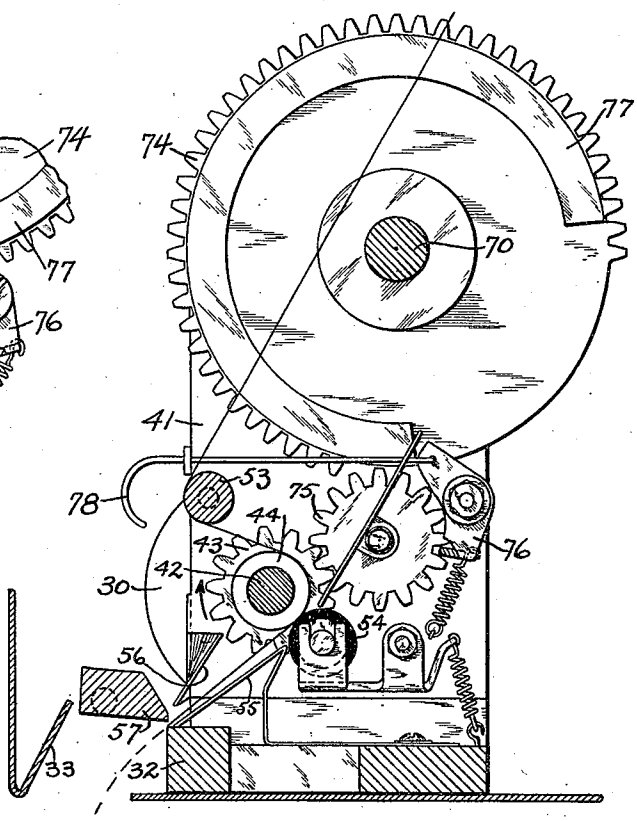
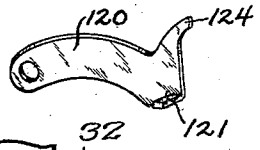


Fig. 3.

Fig. 6.



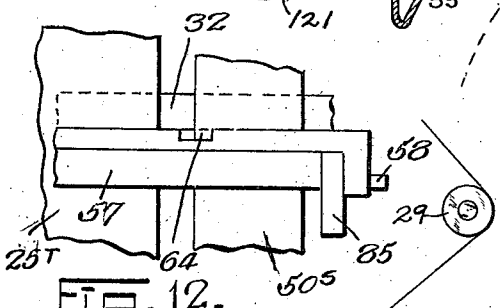


Fig. 12.

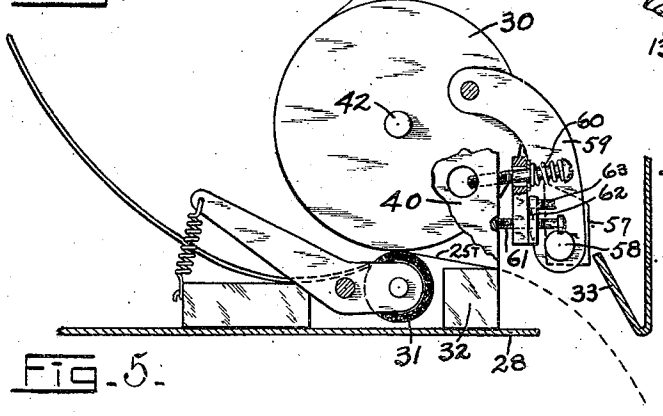


Fig. 5.

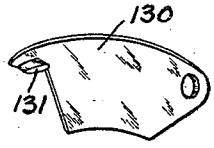


Fig. 7.

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Fig. 8.

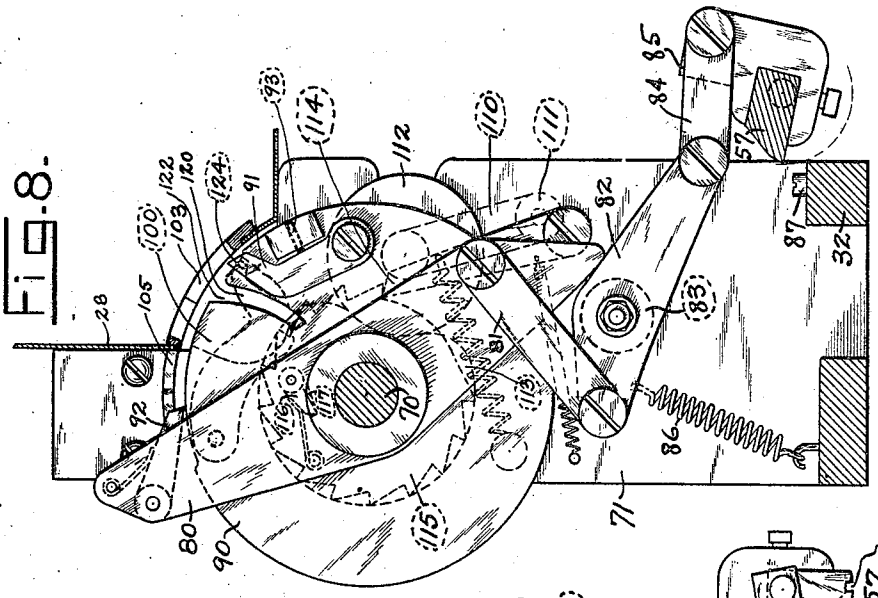


Fig. 9.

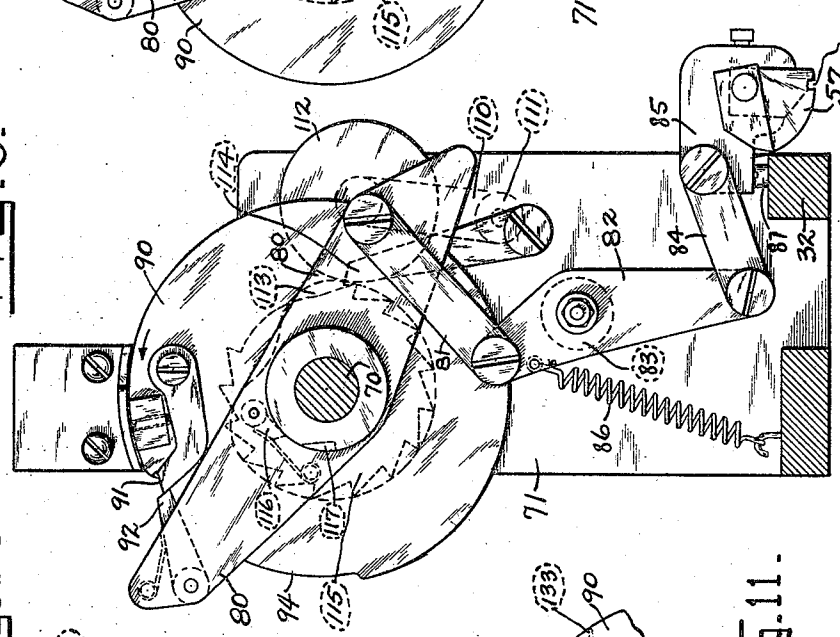


Fig. 10.

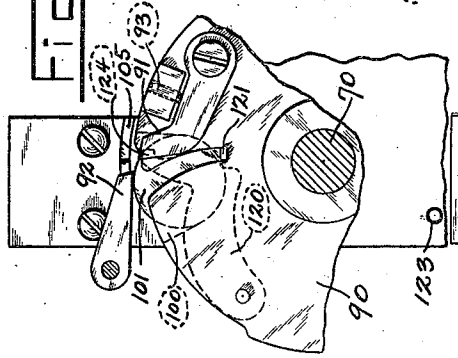
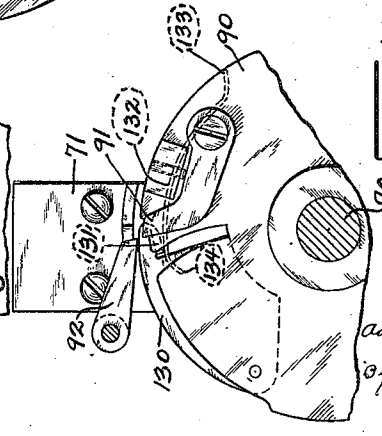


Fig. 11.



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Patented Aug. 6, 1929. 1,723,325

UNITED STATES PATENT OFFICE.

ADAM BOOMERSHINE, OF DAYTON, OHIO, ASSIGNOR OF ONE-HALF TO GRANT W. NICHOLAS, OF DAYTON, OHIO.

DISPENSING MACHINE.

Application filed February 8, 1926. Serial No. 86,743.

This invention relates to machines for dispensing commodities, and in its present embodiment it is adapted to dispense pieces of paper of a size suitable for use as towels, together with small pieces of paper coated with soap and suitable for use as a substitute for a cake of soap in washing one's hands.

Briefly, the present embodiment of my invention comprises a cabinet or casing adapted to house a roll of towel paper and a roll of soap-coated paper, or soap paper, as I shall call it. Projecting from the casing is a shaft which carries a crank for operating the machine. To operate the machine the user turns this crank about a revolution and a quarter, causing a piece of the towel paper (one towel) to emerge from the casing, which towel is nearly severed from the roll, only a small portion remaining attached which serves to sustain the towel until the operator detaches it by a slight pull. Simultaneously a piece of the soap paper emerges from the casing and is likewise nearly severed from the roll. As soon as the operator removes his hand from the crank the crank automatically moves backward to the extent of the fraction of a revolution it has been moved forward, and therefore the crank is always in the same position in its circle of rotation at the beginning of an operation or cycle of movement. In the preferred form here shown the crank can only be operated effectively after a coin has been deposited in a slot, but a modification of this arrangement is shown wherein the crank can be operated without the use of a coin. In either case the crank encounters a positive stop when it has moved the requisite distance forward and it cannot be moved past this stop until after it has been allowed to recede to its starting point.

I shall now proceed to describe my machine and its operation, referring to the accompanying drawings, in which,

Fig. 1 is a perspective view of my machine, enclosed in its cabinet;

Fig. 2 is a front elevational view with the cabinet open;

Fig. 3 is an end elevational view of the mechanism for dispensing and cutting off the paper, as seen on line 3—3 of Fig. 2;

Fig. 4 is a view of portions of Fig. 3, but with the parts in different positions from those they occupy in Fig. 3;

Fig. 5 is a view of a portion of the paper dispensing mechanism, seen from the left hand side of Fig. 2, the casing being removed;

Figs. 6 and 7 are parts of the operating mechanisms, Fig. 6 being used when the mechanism is controlled with a coin, Fig. 7 being used when the machine is not coin controlled, i. e., when it is a free dispensing machine;

Fig. 8 is an elevational view of the operating mechanism as seen on line 8—8 of Fig. 2. Note: lines 3—3 and 8—8 are identical, but are distinguished by arrows indicating which is one and which the other.

Fig. 9 is the same as Fig. 8, but with the parts in a different position, i. e., the positions they occupy at the end of the paper cutting operation;

Fig. 10 shows one position of certain parts when the machine is coin controlled;

Fig. 11 shows the same parts when the machine is arranged for free dispensing;

Fig. 12 shows the manner of notching the shear blade, so as to leave the strip of soap paper attached to the roll by a small unsevered section.

Referring now to Fig. 2, a large roll of paper, 25, is mounted on a core or spool 26, this spool being revolubly supported at 27—27 by the walls of the cabinet 28. Running downward from the roll 25, the paper passes over an idle roller 29, and thence around the propelling roller 30, against the lower side of which the paper is pressed by a spring actuated pressure roller 31, see Fig. 5, in which figure it will be seen that immediately after passing the bite of rollers 30 and 31 the paper, then marked 25T, passes across the top of the fixed shear blade 32. In front of this blade the bottom of the cabinet is cut away to form an opening for the egress of the paper, and attached to the lower edge of the front of the cabinet is an upwardly-inwardly extending guide 33 to deflect the paper and guide it downward should that be needed. The approximate path of the paper as it issues from the machine is indicated with a dotted line in Fig. 5.

The rollers 29 and 30 are journaled in vertical plates 40 and 41, the former being seen at the left and the latter at the right hand end of the rollers in Fig. 2. The axis of roller 30, in the form of a shaft 42 rigidly secured in the roller, passes through the plate 41 and carries a pinion 43, which lies close to

the plate and is rigidly secured to the shaft. Beyond the pinion a sleeve 44 is secured to the shaft. See also Fig. 3. This sleeve serves as the propelling roller for the soap paper.

The roll 50 of soap paper is mounted on a core or spool 51, which is revolubly supported at 52—52. Running downward from the roll 50 the soap paper passes over the idle roller 53 and thence around the roller 44, against which it is pressed by a spring actuated pressure roller 54. See Fig. 3. After passing the bite of rollers 44—54 the paper passes between guides 55 and 56, whereby it is directed between the fixed shear blade 32 and the movable blade 57, the approximate path of the soap paper as it emerges from the opening in the bottom of the cabinet being indicated by a dotted line in Fig. 3.

Associated with the stationary blade 32 is a revoluble shear blade 57, the cross-section of which is shown in Figs. 3 and 8. Referring to Fig. 2 it will be seen that this blade is of helical form, like the blade of a lawn mower. This helical form is also indicated in Fig. 9. The mounting for the left hand end of the blade 57 is shown in Fig. 5, where it is seen that the trunion 58 formed on the end of the blade is mounted in the lower end of an arm 59, the upper end of which arm is pivotally attached to the wall of the plate 40, a fragment of which plate is shown in Fig. 5. In this figure the pivot carrying the arm 59 is shown in section. The free end of the arm 59 is yieldingly pressed toward the stationary blade 32 by a spring 60, while the distance the spring can move the arm is limited by a set screw 61. When the proper adjustment has been effected this set screw is locked by a nut 62 which is tightened by being tilted with a set screw 63. The right hand end of the shear blade 57 is supported by a similar yielding arm arrangement, as can be seen in Fig. 2.

When the pinion 43 is rotated a predetermined amount in the direction indicated by the arrow, by means which will be described presently, a certain length of paper will be drawn from the roll 25 and delivered through the opening in the cabinet. Simultaneously a predetermined length of paper will be removed from the roll 50 and delivered. Obviously the length of the paper 25T (T meaning towel) will be to the length of the paper 50S (S meaning soap), as the diameter of the roller 30 is to the diameter of the roller 44. After the pinion 43 stops rotating the shear blade 57 begins to rock and it first shears the paper 50S from the roll 50 and it next shears the paper 25T from the roll 25. A small portion of the edge of the blade 57 is cut away at 64. This is best seen in Fig. 12. As this figure is diagrammatic the spiral form of the blade is not indicated in the fragment of the blade shown. It is obvious, however, that because of this notch 64 in the blade a short section of the paper 50S will remain unsevered, allowing the paper to hang by a corner as in Fig. 2, The user completes its detachment by a slight pull and thus its fall to the floor is avoided. By means which will be described presently the paper 25T is also left attached by a small section, by which it hangs, as in Fig. 2, until detached by the user.

I shall now describe the mechanism for rotating the pinion 43. A horizontal operating shaft 70 is journaled in the plates 41 and 71, which shaft extends through the right hand wall of the cabinet and carries an operating crank 73. Contiguous to plate 41 a large gear wheel 74 is secured to this shaft. The teeth of this wheel are adapted to enmesh with those of a pinion 75 which is revolubly mounted on the plate 41, this pinion being enmeshed with the pinion 43. See Fig. 3. About one-fourth of the teeth of the gear 74 are cut off, so that rotation of the pinion 75 by the gear is intermittent. To insure retention of the pinion 75 in a position which will permit the entrance of the first tooth on gear 74 between two of its own teeth, a spring-actuated pawl 76 is provided. This pawl locks the pinion against rotation, and at about the moment the first tooth of gear 74 engages pinion 75, a mutilated ring 77 secured to one side of the mutilated gear 74 engages and lifts the pawl out of engagement with the pinion, thus freeing the pinion. The operation of the pawl is illustrated in Fig. 4. Should it be necessary to rotate the roller 30 by hand the pawl 76 can be lifted by a pull on the hook 78.

I shall now describe the mechanism for operating the shear blade 57. Loosely mounted on the shaft 70 is a lever 80. This lever is connected by a link 81 to one end of a lever 82 pivotally mounted on a stud 83 extending horizontally from the plate. The other end of lever 82 is connected by a link 84 to an arm 85 which is secured to the shear blade 57. A spring 86, see Fig. 8, whose tension is exerted on lever 82, moves this series of levers and links to retract the shear blade, i. e., open the shear, as in Figs. 2, 3 and 8. Movement of these parts by the spring is limited by one end of the lever 80 impinging on lever 82, as in Fig. 8. Preferably, the blade 32 is hardened and the blade 57 is unhardened. With this arrangement the backward movement of the latter blade serves to sharpen it, on the principle that a lawn mower is sharpened by backward rotation of the roll, as is well known. Movement of these parts in the opposite direction is arrested by the lever 85 impinging on the screw stud 87, as in Fig. 9.

Secured to the shaft 70 is a disk 90, which carries a lug 91. A pawl 92, pivotally attached to the free end of the lever 80, is normally pressed against the periphery of the disk 90, and when in this position the end of this pawl lies in the path of the lug 91,

and when the crank is turned so as to rotate the disk 90 in the direction of the arrow drawn on the disk in Fig. 9 the lug 91 engages the end of the pawl 92 and rocks the lever to the position shown in Fig. 9, and thus the shear is operated. By proper adjustment of the screw-stud 87 the shear blade 57 is arrested before the paper 25T is entirely severed from the roll, leaving the towel hanging by one corner as in Fig. 2. The relative angular position on the shaft 70 of the gear 74 and the disk 90, is such that movement of the disk from the position it occupies in Fig. 8 to the position it occupies in Fig. 9 occurs while the toothless portion of the gear 74 is passing the pinion 75. Therefore, the paper dispensing rollers 30 and 44 are not rotating at this time. But it is necessary that the rollers shall have been operated and the required lengths of towel and soap paper drawn from the rolls of paper previous to the operation of the shears above described. I shall now describe mechanism for lifting the pawl 92 to let the lug 91 pass under it, so as to permit rotation of the crank one full revolution before it rotates the fraction of a revolution during which the shears are operated as described.

The disk 90 is provided with a pocket 100 adapted to receive a coin 101. This pocket is shown with dotted lines in Figs. 8 and 10. See also Fig. 2. When the crank is turned after a coin has been deposited in this pocket through the slot 103, Fig. 1, the coin raises the pawl 92 sufficiently to let the lug 91 pass under the end of the pawl. See Fig. 10. By means of a screw 93 the radius of movement of the lug 91 may be varied, so that a coin of predetermined diameter will be required to allow the lug to pass the pawl 92. As the disk rotates, the coin drops out of the pocket and into a coin box 102. See Fig. 1. Having turned the crank one revolution, which brings the disk 90 to the position it occupies in Fig. 8, and during which revolution the required length of towel and soap paper having been drawn out of the cabinet, the operator continues turning the crank until it is arrested by the lever 85 impinging on the stop stud 87. Thus the crank is turned about one and one-fourth revolutions forward. When the operator removes his hand from the crank the crank automatically recedes a distance equal to the fraction of a revolution it has moved forward. The spring 86, acting through the lever 82 and associated parts, serves to turn the disk 90 a portion of this distance, that is, until the lever 80 is arrested by engaging the lever 82, as in Fig. 8, after which the recession of the crank is effected by a spring actuated arm 110, pivotally attached to the plate 71 at 111, carrying a roller 112 which acts on a cam 113 carried by the shaft 70. Backward movement of the crank, other than that mentioned, is prevented by a pawl 114 engaging the teeth of a ratchet wheel 115 carried by the shaft 70. A few teeth removed from this wheel permit the required backward movement. Mounted on the lever 80 is a pawl 116, which, when the parts are in their normal positions, as in Fig. 8, abuts the radial end of a notch 117, see Fig. 8, in a collar 118 secured to the shaft 70 between the lever 80 and disk 90. See Fig. 2. Should the shear blade 57 stick and fail to return it can be forced back by the crank. This is a mere safety device as the contingency it provides for is not liable to occur. Pivotally mounted on the disk 90 is a coin ejector 120. See Fig. 10. This device is shown alone in Fig. 6. It has a finger 121 extending laterally from its free end and lying in curved slots 122 cut in the walls of the coin pocket 100. Mounted on the plate 71 is a stud 123, and should the coin fail to drop out of the pocket it will be forced out by the finger 121 when the ejector encounters the stud 123 and is thereby rocked outward. Should a coin be dropped into the slot too small to unlock the crank, the coin can be removed with a small wire hook inserted in the slot 103 in the casing. Getting the hook under the nose 124 which projects from the ejector 120 the ejector can be lifted and the coin with it. The lower portion of the slot 103 is broadened to provide room for the wire. See Fig. 1. A guard 105 is provided to prevent the pawl 92 being lifted by a wire or the like inserted through the slot 103. In Figs. 9 and 10 it will be seen that the periphery of the disk 90 runs close to the guard leaving no space for any implement between the disk and guard. In order to provide for the lug 91 passing the guard and yet permit the extension of the lug beyond the periphery of the disk, a portion of the disk is reduced in diameter, this part being indicated by the numeral 94 in Fig. 9.

To convert the machine into a free dispenser the ejector 120 is removed from the disk 90 and in its place is put a cam 130. See Figs. 7 and 11, which has a lug 131 extending laterally from its free end. Then a deflector 132 is secured to the plate in the path of the lug 131. At the beginning of a cycle of operation, that is, when the disk 90 is in the position it occupies in Fig. 8, the lug 131 lies on the top of this deflector, at a point near its upturned end 133. As the disk 90 is moved to the position it occupies in Fig. 11 the cam 130 raises the pawl 92 and this allows the lug 91 to pass the pawl. The disk is then free to rotate one revolution. At the end of this revolution, however, the lug 131 passes under the deflector 132; therefore the deflector does not lift the pawl 92. Therefore the lug 91 engages the pawl and rocks the lever 80 in the manner already described and operates the shear in the usual way. The left hand end of the deflector is bent down at 134 to form a

ramp, and as this ramp 134 is in the path of the lug 131 the deflector is made flexible so the left hand end can yield to let the lug pass. But immediately after the lug has passed, the deflector springs back to its normal position, so when the disk returns the lug slides up the ramp and is then in position to lift the pawl 92 when the crank is next rotated forward.

As a full roll of paper 25 has considerable weight, to keep it from over-rotating and possibly disarranging the machine in case the crank is turned too rapidly, I provide a novel braking device. This comprises two arms 140, pivotally attached to the back of the cabinet and extending to the top of the roll. The ends of these arms, which arms are preferably made of stiff wire, are bent toward each other and these opposed ends are united by a piece of tubing 141, slipped loosely on them. Secured to each of these arms is a flat plate 142 adapted to lie against the end of the roll, and these plates are pressed against the roll by a spring 143 which draws the arms toward each other. The end of the roll of paper passes over the tube 141 and pressing the tube down on the roll helps to retard the roll. When the roll is reduced to the point where the lower edges of the plates 142 rest on spool 26 the tube 141 is held off of the roll and the only friction remaining is that of the plates 142 against the ends of the roll. A similar arrangement is used on the roll 50 of soap paper.

An extended review of this invention is not necessary. As a vending device it has a large field in railway stations, libraries, theaters and other public places. As a free dispenser it also has a large field of usefulness. The use of soap coated paper in lieu of soap has certain obvious advantages in public or semi-public places. Attempts at obtaining these advantages by the use of liquid soap have not been altogether successful. Paper towels also are highly desirable in public and semi-public places; they are a permanent institution. My machine offers a novel means for simultaneously dispensing a towel and a piece of soap-paper, or sheet soap, as it might properly be called, and in that connection it offers certain novel and useful details, for example, the slight attachment to the rolls by which the towel and soap are supported until detached by the user. Another novel and useful detail is the fact that the towel and soap are delivered unfolded, saving the user the trouble of unfolding the towel.

Having fully described my invention and its preferred embodiment, what I claim and desire to protect by a patent is as follows:

1. A machine for dispensing paper, comprising means for mounting two rolls of paper, an operating crank with a cycle of operation consisting of a revolution plus a fraction of a revolution forward, followed by recession to the extent of said fraction of a revolution, a roller revolved by said crank during a portion of its cycle, said roller having two zones, each of which zones draws paper from one of said rolls, the diameter of one zone being smaller than that of the other, thereby drawing less paper than the other zone, and means for partially severing the portions of paper which have been drawn from the rolls.

2. In a dispensing machine, means for mounting a roll of towel paper and means for mounting a roll of soap-coated paper, an operating crank, a roller revolved by said crank during a portion of its cycle of operation, said roller having zones of unequal diameters, means whereby the zone of larger diameter withdraws towel paper and the zone of smaller diameter withdraws soap-coated paper, said withdrawals being proportional to said diameters, and means for partially severing the portions of paper thus withdrawn.

3. A machine for dispensing paper, comprising means, for mounting two rolls of paper, an operating crank having a cycle of operation consisting of one revolution plus a fraction of a revolution forward, followed by recession to the extent of said fraction of a revolution, means operated by said crank during each cycle of its operation, for drawing a predetermined length of paper from each of said rolls, the length drawn from one roll being considerably less than that drawn from the other.

4. A dispensing machine having an operating crank with a cycle consisting of one revolution plus a fraction of a revolution forward, and recession to the extent of said fraction of a revolution; a shear comprising a rectilineal stationary blade and an oscillatory helical blade, means whereby the latter blade is rotated in cutting direction during said fractional forward motion of the crank, means whereby said blade is rotated backward during said recession of the crank, a stop whereby the crank is arrested at the end of its forward movement, and means compelling said recessive movement of the crank before the crank can again be moved forward.

5. A dispensing machine having an operating crank with a cycle consisting of one revolution plus a fraction of a revolution forward, and recession to the extent of said fraction of a revolution; a shear comprising a rectilineal stationary blade and an oscillatory helical blade, means whereby the latter blade is rotated in cutting direction during said fractional forward motion of the crank, means whereby said blade is rotated backward during said recession of the crank, a stop whereby the crank is arrested at the end of its forward movement, means compelling said recessive movement of the crank before the crank can again be moved forward, yield-

ing means for pressing said blades together, and means for limiting the operation of the last mentioned means.

6. In a machine for dispensing paper, means for mounting a roll of paper therein, and means for retarding the roll as paper is drawn from it, comprising a rod lying parallel to the axis of the roll between the outside and the next layer thereof and maintained in such a position that when the end of the paper is pulled to remove some of the paper the tension put on the paper presses the rod down on the roll and thereby retards its rotation.

7. In a dispensing machine, two rolls of paper, the paper of one roll being much narrower than that of the other roll and coated with soap, mechanism whereby to dispense paper from both rolls simultaneously, and means whereby a shorter piece of the soap-coated paper is dispensed than of the other at each operation.

8. In a machine for dispensing paper, means for mounting two rolls of paper therein at one time, mechanism for simultaneously dispensing predetermined lengths of paper from both rolls and means for substantially severing said lengths from their respective rolls.

9. In a machine for dispensing paper, means for mounting two rolls of paper at one time, mechanism for dispensing a predetermined length of paper from each roll at each cycle of operation of said mechanism, said mechanism including means for partially severing said lengths of paper from their respective rolls, leaving each severed piece attached to its roll by a small unsevered section.

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