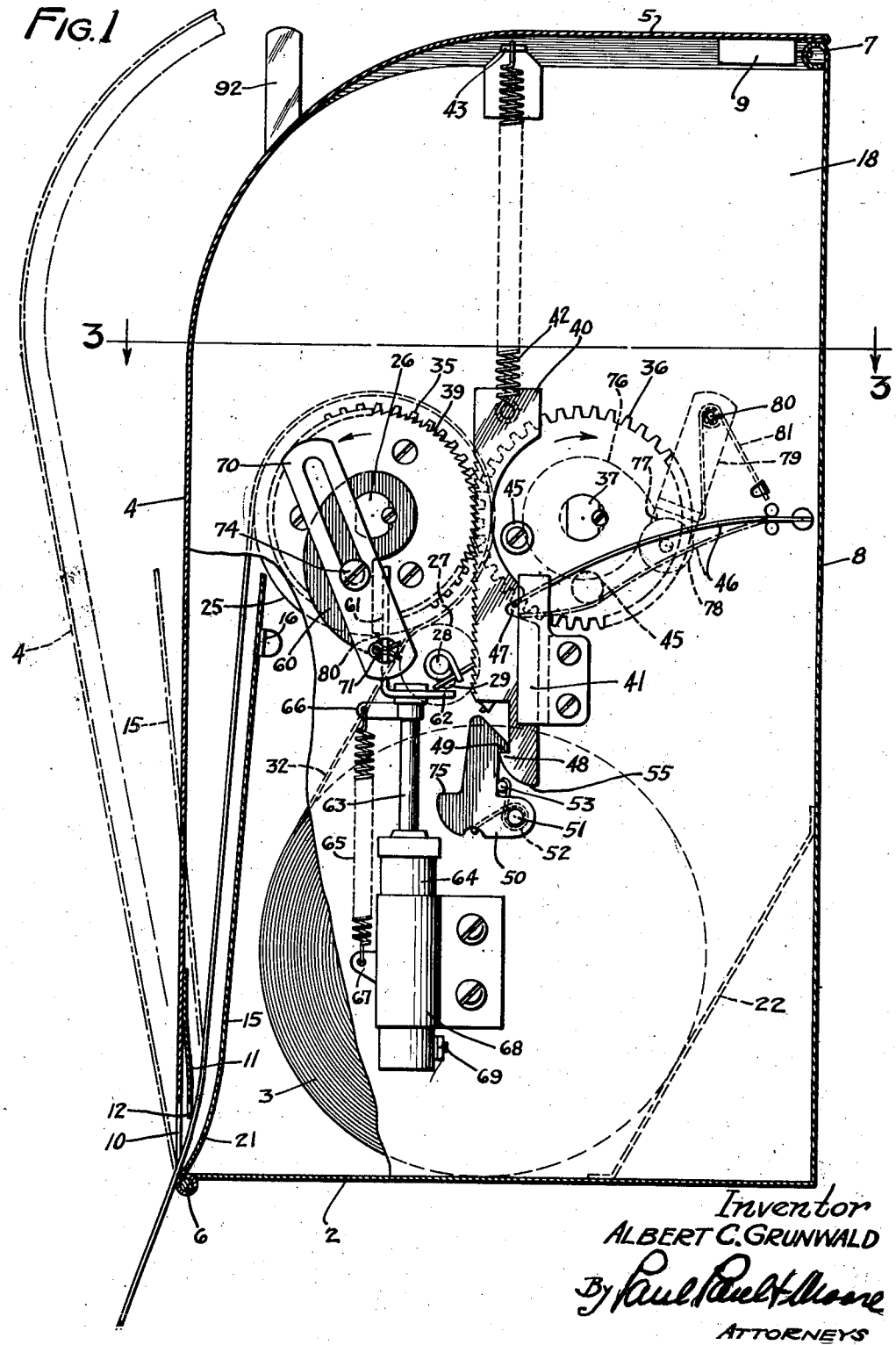
March 12, 1940. A. C. GRUNWALD 2,193,589

TOWEL CABINET AND MECHANISM THEREFOR

Filed Oct. 7, 1936 3 Sheets-Sheet 1

FIG. 1



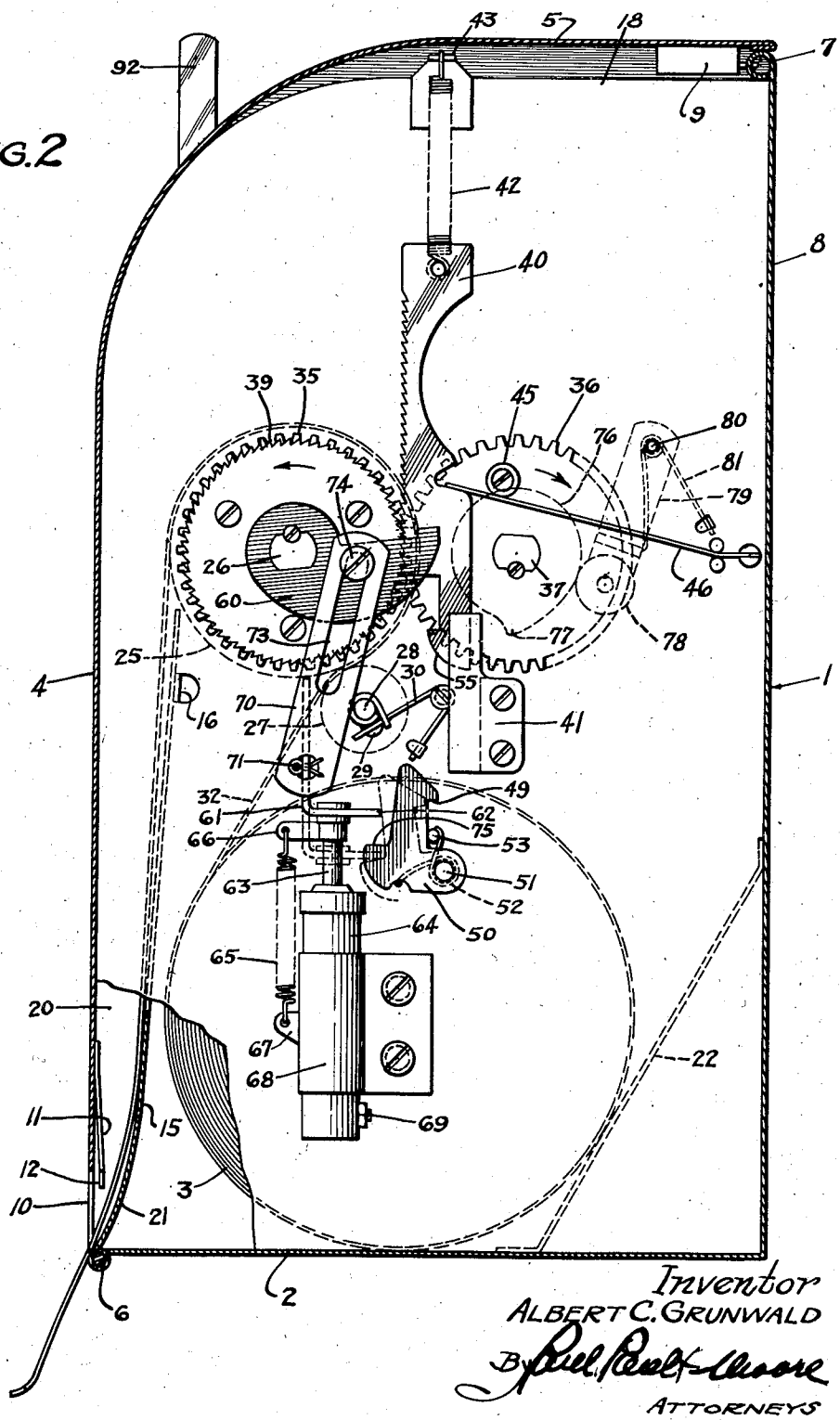
Inventor
ALBERT C. GRUNWALD
By Paul Paul & Moore
ATTORNEYS

March 12, 1940. A. C. GRUNWALD 2,193,589

TOWEL CABINET AND MECHANISM THEREFOR

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FIG. 2



Inventor
ALBERT C. GRUNWALD
By Paul Rule Moore
ATTORNEYS

March 12, 1940. A. C. GRUNWALD 2,193,589

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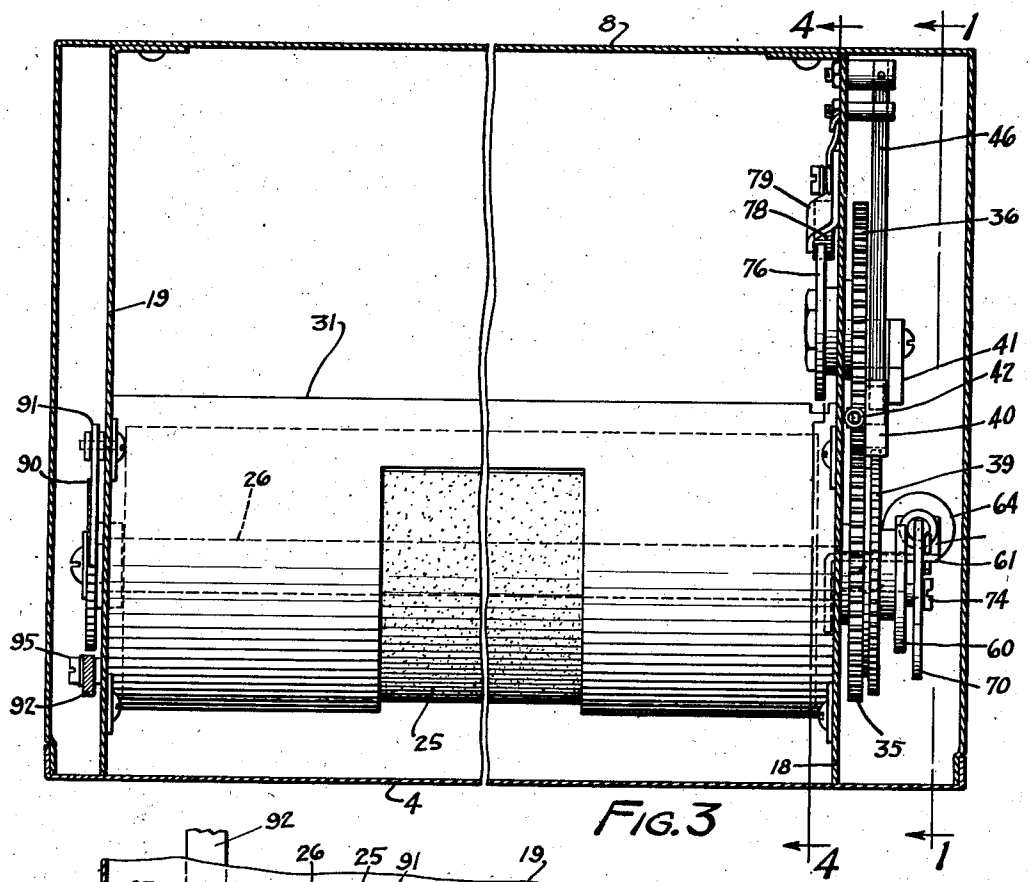


FIG. 3

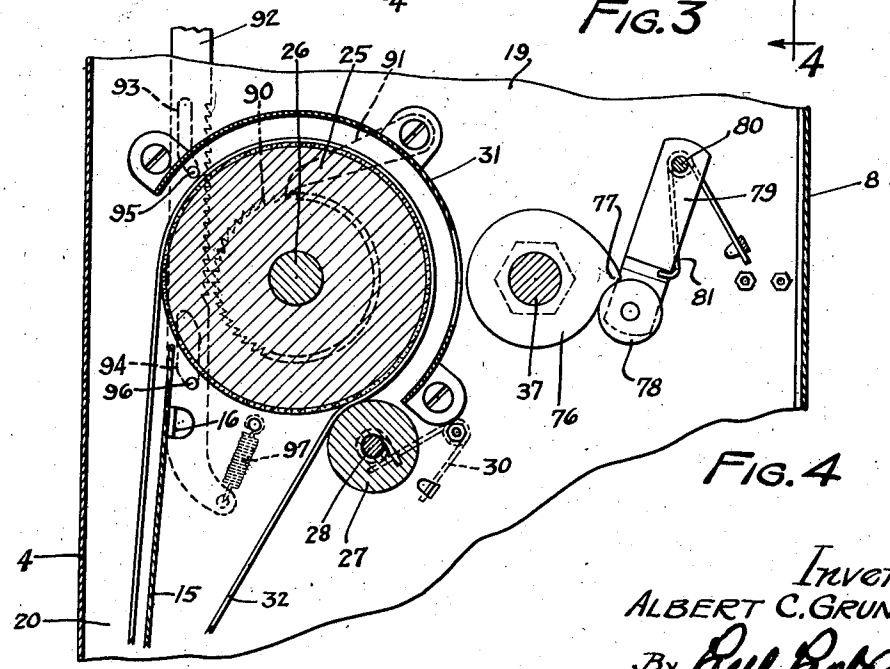


FIG. 4

Inventor
ALBERT C. GRUNWALD
By Bell, Boyd & Moore
ATTORNEYS

Patented Mar. 12, 1940 2,193,589

UNITED STATES PATENT OFFICE

2,193,589

TOWEL CABINET AND MECHANISM THEREFOR

Albert C. Grunwald, River Forest, Ill., assignor to Steiner Sales Company, Salt Lake City, Utah, a corporation of Utah

Application October 7, 1936, Serial No. 104,480

30 Claims. (Cl. 271—2.3)

This invention relates to improvements in sheet or web dispensing apparatus and provides devices which are applicable for handling either washable fabric material or paper or equivalent material. The invention has been herein embodied in a mechanism for handling paper, the supply of which is in the form of a roll, from which lengths of sheets are fed and then torn off by hand.

Objects are: to improve the automatic feeding means; to simplify the construction, and make it more compact; to dispose the time-stop and automatic feeding mechanisms at one side only of the cabinet; and to balance the mechanism and make it more positive in action.

Features of the invention also include, the specific scheme whereby the time-stop mechanism directly controls tripping to initiate feed-out action; the arrangement of throat-forming closure members hinged on a common pivot; the use of one of these members as a separate closure for the supply chamber and the use of the other for giving independent access to the feeding mechanism; the arrangement of these closures to form a throat downwardly through which the paper is fed to a delivery opening at the bottom of the cabinet; the use of a spring-controlled rack bar, and its control and operation for automatically feeding paper at the end of a time period; the use of intermeshed gears one of which is mounted on the measuring roll for controlling the setting of said rack bar; the operation of the back-off mechanism by the shaft of a gear which in turn carries means for setting the rack bar; and all details of construction shown, along with the broader ideas of means inherent in the disclosure.

Objects, features and advantages of the invention will appear in the description of the drawings forming a part of this disclosure and in said drawings:

Figure 1 is a vertical section taken approximately on line 1—1 of Figure 3 looking in the direction of the arrow, and showing the time stop mechanism and related parts positioned as at the beginning of timing and before tear-off;

Figure 2 is a view similar to Figure 1 with the parts positioned as immediately after feed-out action, at the end of the timing period;

Figure 3 is a plan section taken approximately on line 3—3 of Figure 1; and

Figure 4 is a vertical section taken on line 4—4 of Figure 3.

Although my invention is herein embodied in a paper dispensing apparatus, there is no intention to entirely limit this invention to the dispensing of paper, since it may be applied in dispensing textile fabrics.

In the drawings, numeral 1 generally indicates a casing upon the bottom 2 on which rests a supply roll of paper toweling indicated at 3. The casing has a closure member forming the front 4 of the cabinet and merging into a part 5 which forms the top of the cabinet. The part 4 is hinged at its bottom to the bottom 2 of the cabinet by means of a pintle 6 held in eyes suitably formed from the metal of the door and from the metal of the bottom 2. The top portion 5 of the closure, overlappingly engages a bead 7 of the rear wall 8 of the cabinet and a suitable lock 9 is provided having a tumbler which engages in a slot (not shown) of the bead 7.

The lower part of the front portion 4 of the closure is cut out to provide a bottom-delivery opening 10 for the paper, and arranged adjacent this opening and mounted on the part 4 is a tear-off knife 11 having its tear-off toothed edge 12 arranged as shown to project slightly below the top of the opening 10. Cooperating with the portion 4 of the closure to form a guide throat is a plate 15 also hinged on the pintle 6. The inward movement of this plate is limited by lugs 16 of vertical partition plates 18—19 (see Figure 3). The elements 4 and 15 form a downwardly leading guide throat 20. The lower part of the plate 15 curves outwardly and downwardly as indicated at 21 and is concave on its front side. The element 15 forms a closure for what may be considered the toweling supply chamber, and the back of this chamber is provided with a diagonal stop or wall 22 which provides slight friction and prevents the roll moving against the back 8 of the cabinet.

Arranged above and inwardly from the top of the swing-plate 15, with its forward part close to and overlying the plate, is a measuring roll 25 having a shaft 26 or equivalent means suitably journaling it in and between the plates 18—19. The plates extend from the front to the back of the cabinet and are secured by any suitable means preferably to the rear wall. The roll 25 has a suitable friction surface, and cooperating with this surface or with the paper lying thereagainst is a pinch roll 27. The pinch roll has a shaft or trunnions 28 which project at opposite ends through slots 29 of the plates 18 and 19, and suitable spring means 30 is provided to act on the shafts 28 to yieldably move the roll 27 toward the roll 25. A curved guard plate 31 partly surrounds and is spaced from the measuring roll as shown to form a guide for directing the paper around

the roll, and downwardly into the throat 20 formed by elements 4 and 15.

The paper 32 is brought upwardly from the paper supply roll 3, then between the measuring and pinch rolls 25, 27, then upwardly over the measuring roll, thence downwardly into the throat 20 formed by plates 4 and 15. The paper assumes the position best shown in Figures 1 and 2, and it will be seen that it is positioned to be drawn against the teeth 12, and torn by an upward movement from side to side.

An important feature of this invention is a time-stop mechanism having associated therewith and controlled thereby, means acting to automatically feed out the paper or other material at the end of a timed period. In this case, this feed-out follows release of the time stop mechanism, to permit further withdrawal of the paper by hand. Thus, if the user has pulled out and torn off a piece of paper there is no way to get another piece or even to take hold of another piece until after a predetermined period of time, following which the stop is released and toweling or other material is automatically dispensed to visible and accessible position. It will be understood that this invention is not necessarily limited to dispensing toweling, nor to dispensing paper toweling. In this case there is no crank feed necessary, although as hereinafter set forth manual feeding means may be provided if desired for emergency.

Referring first to Figure 1 which shows the stop mechanism in stop position: attached to the shaft 26 of the measuring roll 25, is a spur gear 35 meshing with a second spur gear 36 on shaft 37 journaled in plate 18. Also on the shaft 26 immediately adjacent the gear 35 is a ratchet wheel 39, the teeth of which engage with the corresponding teeth of a ratchet bar 40, suitably guided in part by means generally indicated at 41. A spring 42 is connected by one end to the top of the rack bar 40 and by the other end to bracket 43 of the plate 18. When the user pulls on the paper, the rack bar 40 is moved downwardly against the action of the spring 42 by means of a roller 45 on the gear 36 acting against a spring arm 46, the outer free end of which cooperates with a slot 47 of the rack bar 40 and to move the rack bar downwardly against the action of the spring 42, to its lowermost position. The ratchet bar 40 has one face sliding against the gears and an opposite face sliding against the inner face of the guide 41. Thus the rack is kept in alinement so its teeth always properly cooperate with the teeth of the ratchet wheel 39. Any suitable guide means can be used.

After the rack bar has reached its lowermost position, the spring arm 46 and the roller 45 have assumed the position shown in dot-and-dash lines in Figure 1. The rack or ratchet bar has a shoulder 48 cooperative with shoulder 49 of latch 50 suitably pivoted at 51 to the plate 18. A spring 52 urges the latch 50 against a stop 53, to latching position, from which position it is pushed by the curved lower end 55 of the rack bar 40, as this bar travels downwardly toward its final position of Figure 1. It is of course understood that the measuring roll drives gears 35 and 36 to cause the roller 45 to engage the spring arm 46 and force the ratchet bar to latched position. During the motion of the ratchet bar from its uppermost position of Figure 2 to its lowermost and latched position of Figure 1, a timing mechanism now to be described, is being set so that at the end of a time period it will trip the latch 50 and release the rack bar 40, which is then moved upwardly under the combined actions of the springs 42 and 46, to act through its ratchet teeth, upon the ratchet wheel 39, to rotate the measuring roll 25 and feed the paper outwardly to the position shown in Figure 2, which figure shows the position of the mechanism at the end of this feeding period. It is noted that the timer (later described) has at this time been moved part way in setting direction.

The timer setting mechanism is generally of the type shown in co-pending application to Birr No. 15,271. This time stop mechanism herein, comprises a stop arm 60 keyed to shaft 26 of the measuring roll, and a slide stop 61 suitably mounted, by means not shown, to freely slide vertically in the plate 18 across the path of arm 60. This slide stop 61 is connected by an arm 62 with a stem 63 of a plunger type air-displacing timer, generally indicated at 64. The outer end of the arm 62 acts as a trip, as will be later disclosed. The stem is urged downwardly by means of spring 65 connected by one end to an arm 66 of the stem and by the other end to a projection 67 of a bracket 68 which secures the timer barrel in operative position to the plate 18. The timer has an air vent 69, which operates in a well known manner.

A link 70 is pivoted to the slide stop 61 as at 71 and has a slot 73 through which a pin 74 loosely passes, which pin is threaded into the arm 62. The arm 62 forms a trip for the latch 50 and engages a shoulder or stop 75 of the latch during its downward movement and retracts the latch against the action of its spring 52 to the position shown in dot-and-dash lines in Figure 2, thus releasing the ratchet bar 40 at the end of the time period.

To prevent the arm stop 60 from remaining in frictional contact with the slide stop 61, following its impact therewith, and therefore to prevent interference with a downward travel of the slide stop 61, a back-off mechanism is provided. The back-off mechanism is associated with the gear 36, and with the shaft 37 of this gear, which is a feature. Referring to Figure 4: On the inside of the plate 18 is arranged a disc 76 having a shoulder 77 which engages with a roller 78 carried by an arm 79 pivoted as at 80, and pressed by the spring 81 toward the disc 76. The back-off of the position of the parts of Figure 4 corresponds to the spaced relation of the end 80 of the arm 60, see Figure 1, relatively to the slide stop 61. Just before impact between arm 60 and slide stop 61 occurs, the shoulder 77 engages the roll 78, and pushes the arm away from the disc 76 slightly. The spring then rotates the disc 76 in the opposite direction to back-off of the arm 60 and thus bring its end 80 in the spaced relation shown in Figure 1.

Although in most instances there will be no need for manual means other than a pull on the paper to feed the paper or operate the measuring roll, I have thought it best to provide means, in addition to the automatic feeding of the paper after timing, by which the paper can be manually fed out if necessary. It may happen that when my invention is applied to a hand tear-off type of cabinet, as disclosed herein, the user instead of grasping the small accessible portion of the toweling shown in Figure 2 and pulling it to the limit, will tear off this small portion. In such a case the automatic feeding means would not be set for operation following the timing period of the time-stop mechanism.

I therefore provide the following manually operable feed-operating means: Referring now to Figures 3 and 4, on the end of the shaft 26 at the outer side of the plate 19, is keyed a ratchet wheel 90 having a pawl 91 to prevent reverse rotation. There is also provided a rack bar 92 having slots 93—94 with pins 95—96 passing respectively therethrough as shown. This rack bar projects through a slot in top of the casing so that it may be pressed downwardly by the finger, and the rack bar is normally held in its upper position by the spring 97, and out of contact with the ratchet wheel 90. The bar is guided by the slots and pins, and when pushed downwardly from the position shown in Figure 4, engages and drives the ratchet wheel 90 to move the measuring roll to project the paper sufficiently to be taken hold of. On release the rack bar again automatically assumes the position shown in Figure 4.

Operation

Assuming the parts to be positioned as in Figure 2, the operator pulls downwardly on the paper rotating the measuring roll 28 in counterclockwise direction, and correspondingly rotating the gear 36 in clockwise direction, and moving the roller 45 from the position shown in full lines to engage the spring 60 at a point nearer its support. As this motion continues the rack is brought to its lower or latched position, of Figure 1, and the link 70 raises the timer stem to the position shown in Figure 1. When this position is reached the stop arm 60 has engaged the slide stop plate 61, and the roller 45 has traveled in clockwise direction to the dot-and-dash line position, whereby it has flexed the spring arm 46, as shown, and this arm has acted to move the rack 40 to latched position. After the parts have been positioned as in Figure 1, the timer moves downwardly and until the projection 62 engages a shoulder 75 of the latch 50, and moves the latch to the dot-and-dash line release position of Figure 2. As soon as tripping occurs the rack 40 moves upwardly under the actions of the springs 42 and 46, the teeth of the rack cooperating with the teeth of the disc to rotate the measuring roll, and thus automatically feed the paper to the position shown in Figure 2.

The above construction gives a very positive feeding action at the end of the timing period, due to the combined actions of the springs and of course the spring tensions are so proportioned as to permit proper operation by relatively light pull on the paper, and without prematurely tearing the paper. Various grades of paper may be used, and a paper which is tough and at the same time absorbent is preferably used.

I claim as my invention:

1. In combination with a paper dispensing apparatus which has a time-stop mechanism controlled by and controlling a measuring roll, auxiliary means automatically operable for moving said measuring roll in feed-out direction, means by which feed-out operation of the measuring roll operates said auxiliary means to set it for automatic operation, and means operated by said time-stop mechanism at the end of a time period for releasing said set auxiliary means for automatic operation.

2. In combination with a paper dispensing apparatus which has a time-stop mechanism controlled by and controlling a measuring roll, auxiliary means automatically operable for moving said measuring roll in feed-out direction, and a latch for holding said means for release, means by which feed-out operation of the measuring roll operates said auxiliary means to cause it to be held by the latch for automatic operation upon release by said latch, and means operated by said time-stop mechanism at the end of a time period for releasing said latch.

3. In combination with a paper dispensing apparatus which has a time-stop mechanism controlled by and controlling a measuring roll, auxiliary power means automatically operable for moving said measuring roll in feed-out direction, and a latch for holding said means for release, means by which feed-out operation of the measuring roll operates said power means to cause it to be held by said latch for subsequent power action, and means moving with a part of said time-stop mechanism for tripping said latch at the end of a time period.

4. A paper cabinet comprising, a roll frictionally engaged by the paper to be moved by or to move the same, power means automatically operable for moving the roll in paper-advancing direction and a latch for holding said means for subsequent release and automatic operation, means by which the roll operates the power means when the roll is moved in paper advancing direction, to move it to latched relation with said latch, a time-stop mechanism and means by which said roll operates the same to set the timer when said roll is moved in paper dispensing direction, and means operated by said time-stop mechanism to trip said latch at the end of the time period.

5. A paper dispensing apparatus having, a measuring roll, a time-stop mechanism controlled by and controlling the roll, a spring controlled rack bar and means by which when the spring moves the bar controls the roll to move it in feed-out direction, means operated by the roll as it moves in feed-out direction for moving said bar against the action of the spring, including two meshing gears, a latch which holds the bar after being moved, and means forming a part of said time-stop mechanism and acting to trip the latch at the end of a time period.

6. In a paper dispensing apparatus, a measuring roll, a time stop mechanism controlled by and controlling the roll, a rack bar and a spring for actuating it, a latch for securing the bar after movement against the action of the spring, and means by which the bar controls the roll to move it in feed-out direction including ratchet teeth mounted to move with the roll, means operated by the roll as it moves in feed-out direction for moving said bar to set position against the action of the spring including a pair of meshed gears one on the roll and one independently mounted, a roller on the independently mounted gear, a spring arm engaged with the rack bar and with which the roller is adapted to engage to move the rack bar against the action of the actuating spring, and means forming a part of said time stop mechanism for tripping the latch at the end of a time period.

7. In a paper dispensing apparatus, a measuring roll, a time stop mechanism including a first stop on the roll, a second stop adapted to be brought into the path of the first, means by which feeding motion of the roll moves the second stop into the path of the first and thereafter permits it to move out of said path, a timer operated by the second stop to be set as the stop moves into the path of the first and thereafter

to time the motion of said second stop out of said path, a first gear on the roll, a second gear independently mounted and in mesh therewith, a latch which is tripped by the timer at the end of a time period, a translatable rack bar and means by which it drives the roll in feeding direction, means by which the second gear controls the rack bar to move it to engage the latch.

8. In combination with a towel dispensing apparatus which has a stop mechanism controlled by and controlling a measuring roll, auxiliary power means automatically operable for moving said measuring roll in feed-out direction, and a latch for holding said means for release, means by which feed-out operation of the measuring roll operates said power means to cause it to be held by said latch for subsequent power action, and means moving with a part of said stop mechanism for tripping said latch when the stop mechanism is rendered ineffective.

9. A paper towel dispensing device comprising a case for holding a supply of paper toweling, the case having a discharge opening, spring means in the case operable to eject an edge portion of the toweling through the discharge opening to be engaged by the user whereby the user may withdraw toweling from the case, releasable means holding the spring means against operation, means for releasing the said releasable means, and means operable by the force applied to the toweling during withdrawal of the same for conditioning the spring means for a succeeding operation.

10. A dispensing device comprising a case for containing a supply of toweling, the case having a discharge opening, means for ejecting a portion of the toweling from the opening to be grasped by the user for the purpose of withdrawing toweling from the case, said means including a rotatable member in the case, means training a portion of the toweling on the member whereby the member has movement controlling engagement with the toweling and is turnable by the toweling when the toweling is withdrawn from the case, and spring means for turning the member to eject said portion of the toweling from the opening, and means operable by turning of the member when the toweling is manually withdrawn for conditioning said spring means for a subsequent ejecting operation.

11. In combination with a paper dispensing apparatus of the tear-off type in which the remaining supply is invisible and inaccessible after a length has been torn off, time-stop mechanism operated by pull on the paper, and means operating automatically after timed release of the stop mechanism to cause paper to be brought to visible and accessible position.

12. In combination with a towel dispensing apparatus in which the toweling is in frictional relation with a roll to be moved by the roll or to move the roll, time-stop mechanism controlled by and controlling the roll, and means controlled by and controlling the roll and adapted to automatically move the roll to dispense toweling after a timed release of said stop mechanism.

13. A towel cabinet comprising a measuring roll actuated by a pull on the toweling and adapted to advance the toweling, a time-stop mechanism and means by which the roll controls and is controlled by it, and means controlled by and controlling said roll to cause it to automatically dispense toweling following a timed release of the roll by the time-stop mechanism.

14. A towel cabinet comprising a roll with which the paper is frictionally engaged to move the roll when the paper is pulled or to advance the paper independently of a pull on the paper, a time-stop mechanism, means by which it is controlled by the roll to stop the roll and to be conditioned for a timed release, means acted upon by paper-advancing motion of the roll to be conditioned to automatically move the roll to promptly advance the paper to accessible position following stop release at the end of the time period, and means for manually operating the roll td advance the paper to a position from which it can be grasped and pulled out.

15. A sheet material dispensing apparatus having a measuring roll, a time-stop mechanism controlled by and controlling the roll, a spring and means by which the roll puts it under tension during feeding motion and conditions it for automatically moving said means to move the roll in feeding direction after release of said roll by said stop mechanism at the end of its time period.

16. In an apparatus for dispensing sheet material, a cabinet, having the following mechanism, all concealed within the cabinet, a measuring roll with which the sheet is in frictional feeding engagement, a time-stop mechanism and means by which it is controlled by and controls the roll, and roll-driving means operated by the roll to be conditioned for roll-driving as the roll is operated in feeding direction, and adapted to automatically drive the roll after a timed release of the stop mechanism to feed the sheet to visible and accessible position.

17. A sheet material dispensing apparatus having a measuring roll, a time-stop mechanism controlled by and controlling the roll, and means controlled by and controlling the roll to be set for controlling action as a result of roll rotation in feeding direction, and to automatically drive the roll in feeding direction after release of the roll by said stop mechanism at the end of its time period.

18. A paper dispensing mechanism having, a timer, means operable by the paper as it is dispensed for initiating timing action of the timer, and means operating at the end of the timing period for automatically accessibly positioning more paper.

19. A paper dispensing apparatus having an automatic timing mechanism, means by which the timer is caused to perform a timing operation following pulling out of paper, and means operating promptly after timing action of the timer to automatically accessibly position more paper.

20. A towel dispensing mechanism having means by which toweling is made accessible for pulling out, a timer, means by which timing action of the timer is initiated as a result of operation of the first means, and means operating automatically at the end of the time period to operate the first-mentioned means to bring paper to accessible position.

21. A paper dispensing mechanism having first means controlling the movement of paper to accessible position, a timer, and means by which the first means initiates its action as paper is dispensed including a latch which is moved to latching position as the paper is dispensed and which is tripped by the timer at the end of the timing period to allow the first means to move the paper to accessible position, and means oper-

able on release of the latch to cause said first means to move the paper to accessible position.

22. A sheet dispensing device having a measuring roll, a spring and means by which it is put under tension as the roll is rotated, said means acting after the roll has been rotated to a predetermined extent, to automatically continue roll rotation in the same direction, and means for temporarily locking the roll at the end of said predetermined degree of rotation, whereby the parts are conditioned so that the spring actuated means will rotate the roll when said last mentioned means is released.

23. In a dispensing mechanism, feeding means, a spring and means by which it is tensioned by the feeding motion of said feeding means and conditioned to automatically cause additional feeding motion of said means, means for limiting feeding motion of said feeding means in a position whereat said spring is conditioned to automatically cause said additional feeding motion, means for automatically moving said limiting means to allow said spring to cause said additional feeding motion of said feeding means, said feeding means being a roll and said means by which the roll conditions said spring to cause additional feeding motion of the roll including, a bar connected to the spring and moved by means actuated by the roll to put the spring under tension as the roll moves in feeding direction.

24. A sheet dispensing apparatus in which a portion of the sheet is normally accessible for being dispensed by hand, means movable by the sheet as it is dispensed, means limiting the movement of said movable means during sheet dispensing action, means for automatically releasing said limiting means at the end of a time period, and auxiliary power means acting to move said movable means to cause more of the commodity to be made accessible and means by which said movable means conditions said power means for automatic action at the end of said time period.

25. A device of the class described having dispensing means having a time-stop mechanism, and means for automatically operating the dispensing means following a timed release of said time-stop mechanism.

26. A device of the class described having dispensing means having a time-stop mechanism, and means set by said dispensing means and adapted for automatically operating said dispensing means following a timed release of said time-stop mechanism.

27. A supply dispensing apparatus in which part of the supply is normally accessible, and having a timing mechanism, first means by which some of the supply is made initially accessible, and second means by which operation of said first means to make some of the supply accessible initiates a timing operation of the timer, and means by which said first means is caused to automatically, accessibly position some more of the supply at the end of the timing period of the timing mechanism.

28. In a dispensing device, having dispensing means controlled by a time-stop mechanism and means automatically acting on the dispensing means after release of the time-stop mechanism to move said dispensing means for dispensing.

29. A sheet dispensing apparatus having dispensing means and a stop mechanism controlled by and controlling said dispensing means, a spring and means by which it operates said dispensing means for dispensing, on release of said stop mechanism.

30. In a dispensing device for sheet material, which has feeding means controlled by a stop mechanism, means acting after release of the stop mechanism to automatically operate the feeding means to make sheet material accessible.

ALBERT C. GRUNWALD.