

March 12, 1940.

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2,193,759

TOWEL DISPENSING TIME-STOP MECHANISM

Original Filed July 20, 1936

5 Sheets-Sheet 1

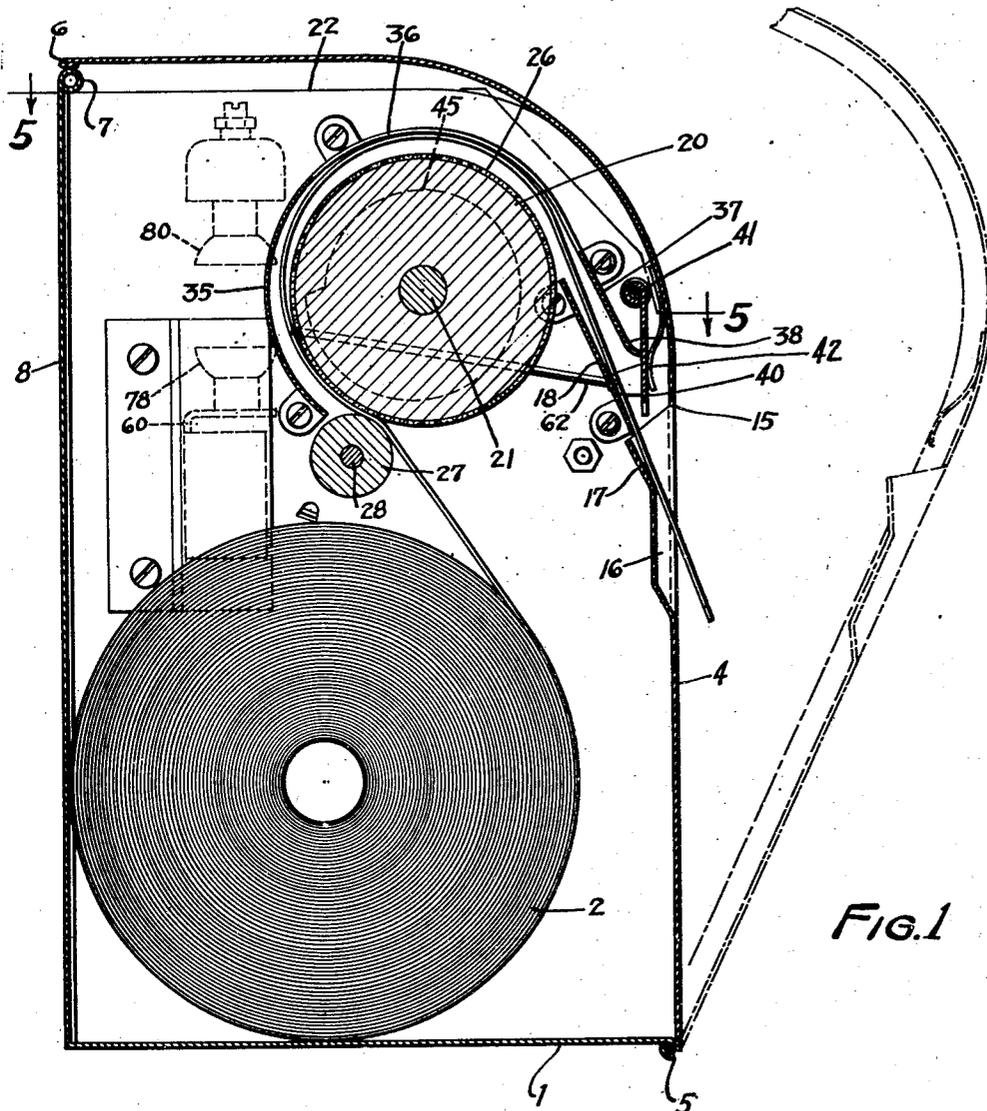


FIG. 1

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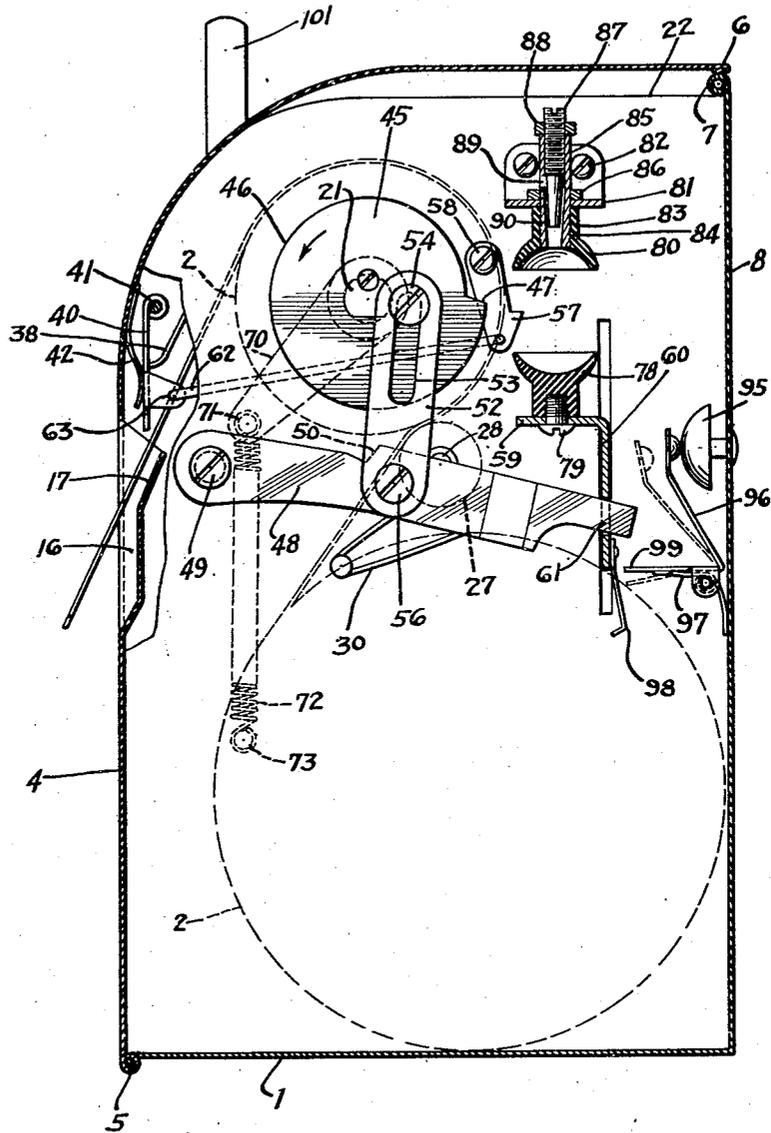
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5 Sheets-Sheet 2

FIG. 2



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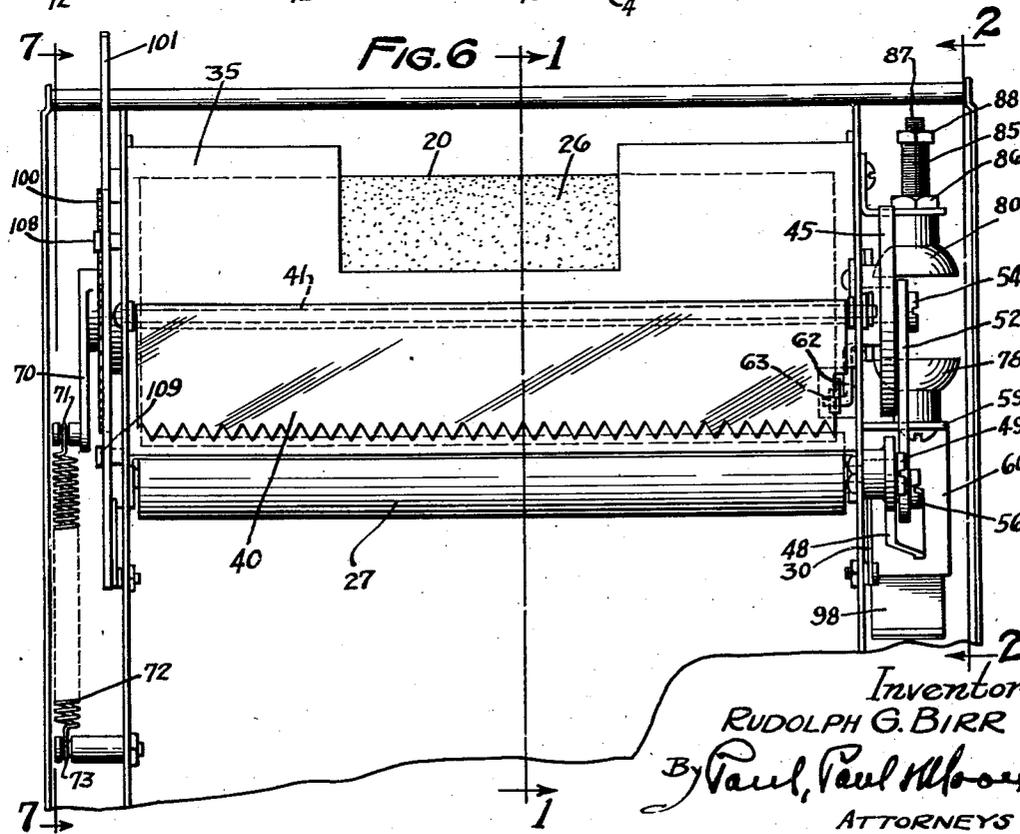
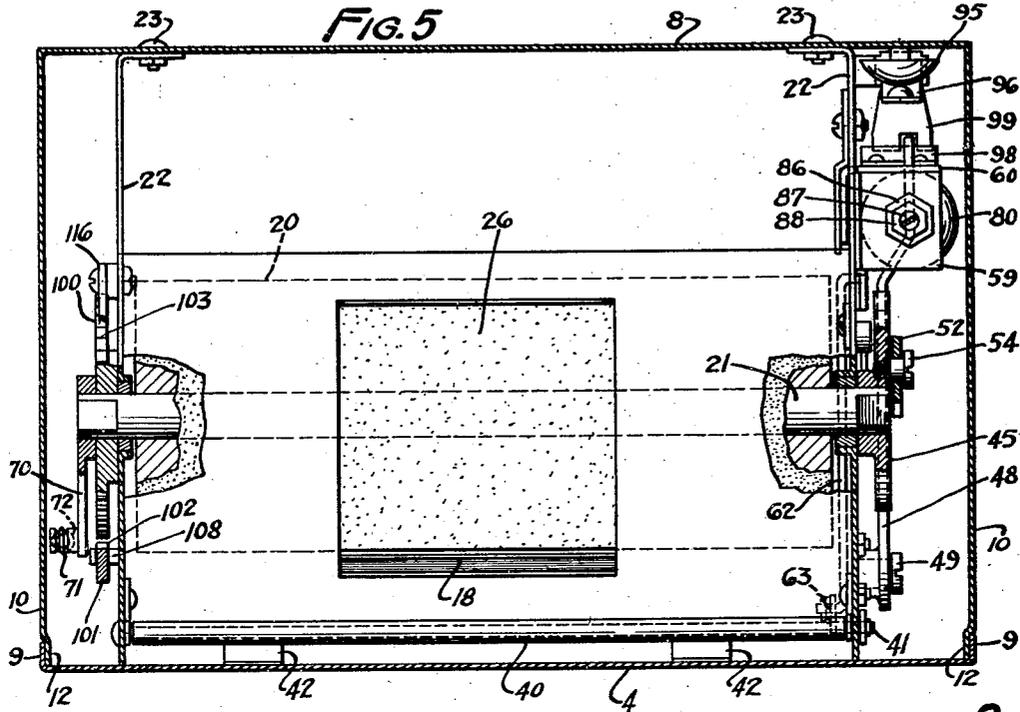
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TOWEL DISPENSING TIME-STOP MECHANISM

Original Filed July 20, 1936 5 Sheets-Sheet 4



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2,193,759

TOWEL DISPENSING TIME-STOP MECHANISM

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Application July 20, 1936, Serial No. 91,515
Renewed September 9, 1939

13 Claims. (Cl. 164—84.5)

This invention relates to improvements in
towel dispensing apparatus and provides de-
vices which are applicable for handling either
washable material or paper or equivalent mate-
rial, the invention being applicable for handling
paper toweling, in conjunction with tear-off
means.

One of the important objects of the present
invention is to provide a sanitary cabinet, that
is, one in which there is no part which normally
must be operated to dispense paper, and one in
which no button is pushed to release a stop
mechanism, and one in which only a relatively
small portion of the toweling is ever exposed for
any considerable period of time. After 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 is automatically dispensed to visible
and accessible position. No feeding crank is
used.

Therefore, a very important broad feature of
this invention is means automatically operating,
after or following release of the stop mechanism,
to dispense toweling.

Another object is to use a tear-off knife and
so position the same that after tear-off the paper
is invisible and inaccessible at the outside of the
cabinet. An important feature relates to the
automatic feeding of the toweling after tear-off.
When a time-stop is used part of the length is
fed out to a visible and accessible position at the
end of the timing period; when only a stop
mechanism is used without a timer, the paper is
fed out following release of the stop mechanism.

Another feature relates to means by which the
tear-off knife releases the stop mechanism, or,
when a timer is used, initiates timer action.

Important objects of the invention therefore
are; to provide means controlled by tear-off
action for releasing the stop mechanism to per-
mit feeding of another length; to provide means
whereby additional toweling cannot be obtained
until tear-off action occurs; to provide a time-stop
mechanism with means whereby the timer cannot
act until the previously fed length of toweling
has been torn off by the user; to provide a timer
having two surfaces which are brought together,
to remain immovable during timing, and to be
separated only at the end of the time period; to
use two vacuum cups for the foregoing purpose
which are brought into vacuum suction relation
by feeding action and in which there is a time
release of the suction action to correspondingly

release the stop mechanism; to provide means
whereby the paper is automatically fed to acces-
sible position at the end of a timing period; and
to provide means acting directly on the feed roll
to automatically feed sufficient toweling to be
grasped by the user preparatory to pulling out
the remainder of the length.

Objects of the invention will appear in the de-
scription of the drawings forming part of this
disclosure, and in said drawings:

Figure 1 is a vertical transverse section through
the apparatus, taken approximately on line 1—1
of Figure 6, with the mechanism in the normal
position wherein an end portion of the paper is
visibly and accessibly positioned for grasping;

Figure 2 is a vertical section taken approxi-
mately on line 2—2 of Figure 6, illustrating the
time-stop mechanism positioned in correspond-
ence to parts of Figure 1;

Figure 3 is a section similar to that of Figure
2, but showing the time stop mechanism posi-
tioned as at the end of a toweling delivery period,
and immediately before severing;

Figure 4 is a view similar to Figures 2 and 3,
with the time-stop mechanism positioned as when
the paper is being pulled against the tear-off
blade;

Figure 5 is a plan section taken approximately
on line 5—5 of Figure 1;

Figure 6 is a front view of the upper part of
the cabinet, with the door or closure, open;

Figure 7 is a vertical section on line 7—7 of
Figure 6 showing the initial position of the
emergency feeding device; and

Figure 8 is a view of the device of Figure 7,
showing the feeding action.

In the drawings, numeral 1 generally indicates
a casing, upon the bottom of which rests a supply
roll of paper toweling 2. The casing has a clo-
sure member 4, pivoted as at 5 to bottom of the
casing 1. The upper end 6 of the cover overlap-
ping engages a bead 7 of the rear wall 8 of the
cabinet. Referring to Figure 5, it is noted that
the closure member has laterally arranged flanges
9, the outer surfaces of which are flush with the
corresponding surfaces of the sides 10 of the cabi-
net. This is accomplished by inseting the for-
ward marginal portions of side walls 10 as at 12.

The closure 4 is provided at the front with an
opening 15, through which the toweling is pro-
jected to a visible and accessible position. The
front part of the closure 4 is punched inwardly or
otherwise formed as at 16 to include an upwardly
inwardly slanting portion 17 which with a guide
plate 18 serves to direct the paper to the down-

wardly, outwardly, slanting position shown. Arranged rearwardly of plate 18, with its periphery substantially tangent thereto, is a roll 20 having a shaft 21 which extends from opposite sides through and which is journaled in plates 22, see Figure 5. These plates extend from front to back of the cabinet and are suitably secured at the rear as at 23. This roll has a friction surface 26, and a pinch roll 27 cooperates with this surface, or with the paper which is disposed between the pinch roll and the surface. The pinch roll 27 has a shaft 28 which projects at opposite ends through slots 29 of plates 22. Suitable spring means 30 are provided to act on the ends of shaft 28 to move the roll 27 toward the roll 20.

Around the roll and spaced therefrom is a curved guide plate 35 having an opening in its top 36 through which access can be had to the paper to facilitate initial threading of the same through a guide described below, this threading being facilitated by pressure of the paper against the surface 26 of roll 20. Roll 20 may be driven by friction of the toweling or by a crank. This curved guide 35 has a forward portion 37, forming with the plate 18, a throat leading to opening 15. The outer end 38 of this part 37 forms a stop for limiting the inward movement of a pivoted tear-off blade 40, which is pivoted as at 41 to plate 22. The cover 4 has thereon a spring 42 which when the cover is closed presses the blade against the stop 38, but allows the blade to be moved outwardly during the tear-off operation.

An important feature of this invention relates to a stop mechanism with or without a timer which cannot be released unless paper is torn off or until paper is torn off, thereby forcing the user to tear off before he can get more paper from the cabinet. Referring first to Figure 2, which shows the initial position of the mechanism with a portion of the toweling accessibly projected for grasping to pull out that amount of toweling permitted by the stop mechanism. It will be understood at the start that I do not intend to limit this invention entirely to a timing mechanism, although this is also claimed. The stop mechanism comprises, in this instance, a disk 45 having a spiral face 46 providing a stop shoulder 47. This disk 45 is suitably fixed to the end of the shaft 21 (see Figure 5) and forms a part of the means operated by the roll to limit its degree of rotation. A lever 48 is pivoted at 49 to one of the side plates 22 and has a shoulder 50 engageable with the shoulder 47 of the disk as shown in Figures 3 and 4 to limit withdrawal of the toweling. Connecting the disk and lever is a link 52 having a slot 53 through which loosely passes a pin 54 which is threaded into the outer face of the disk 45. The opposite end of the link is pivoted as at 55 to the lever. The lever controls a slide 60 to raise and lower it. The relation of these parts is such that when the roll is moved either by crank or by pull on the paper, the lever is raised to the stop position of Figure 3 and is held in that position by a latch 57, pivoted as at 58 and cooperating with the outer horizontal portion 59 of the slide 60 mounted on plate 22 and traversed by the end of the lever as shown at 61, so that the lever and slide move in unison. Any suitable latch means can be used and there is no intention to limit the invention entirely thereto. The latch is operated by a rod 62 pivoted to the tear-off blade 46 as at 63. (See dotted line position at right of Figure 5.) The rod lies at the inner side of the plate

22 and near the latch passes through a slot 64 in the plate, see Figure 3.

Figure 2 shows the parts ready for dispensing, and the time stop mechanism is in release position. The operator now grasps the protruding end of the paper and pulls it to the position of Figure 3. During this movement the link 52 raises the bar 48, and the cup 78 engages the cup 80 before shoulder 47 engages shoulder 50. In this embodiment the parts are so arranged that shoulder 50 is brought into the stopping path of shoulder 47 after about one-quarter of a revolution of the roll from its position in Figure 2. The stops 47 and 50 are engaged after about three-quarters of a revolution of the roll, but, of course, there is no limitation intended by this statement because this may be varied by changing the diameter of the roll.

It will be noted that after the latch has assumed the position shown in Figure 3, the stop mechanism is so conditioned that no more paper can be withdrawn, and that in order to get more paper, the paper already withdrawn must be torn off. The tear-off operation is illustrated in Figure 4 and it is noted that the force applied by the tear-off operation moves the pivoted blade 40 to the position shown, correspondingly moving the latch to release the slide, and therefore the stop. Where a timer is used this latch release corresponds to the initiation of the timing period, but where no timer is used (and this is a feature of the invention) tear-off results in immediate release of the stop mechanism so that more paper can be withdrawn.

Another feature of the invention relates to means automatically acting immediately after release of the limiting means to move the roll to partially feed a portion of a given length of the paper to the accessible position shown in Figures 1 and 2. Referring first to Figures 2, 5 and 6; at that end of the shaft 21 opposite the stop mechanism is attached an arm 70, having secured thereto as at 71, one end of a spring 72. The opposite end of the spring is attached as at 73 to the plate 22. The arm 70 is free to make a complete revolution following that of the roll. When the roll moves in counterclockwise direction from its position in Figure 2, the spring 72 is put under tension and remains under tension after the roll has made a complete revolution, and reaches the stop position shown in Figure 3. The degree of tension is such that, when the stop is released, the spring will move the roll in feeding direction to the position shown in Figure 2. In release position the latch lever 48 is in its lowermost position. In this instance the roll has, after stop release, made a quarter turn from its position in Figure 3 to its position in Figure 2. The degree of rotation is merely made sufficient to accessibly project a portion of the paper for grasping, so that the remainder of the length can be had by pulling on the projected portion.

Another feature of this invention is the use of the timer in conjunction with the foregoing combination, and the specific form of timer is also a feature. This particular type of timer is an improvement over that disclosed in my pending application 76,040, and is of the vacuum cup type.

Although the broad idea of using a vacuum cup as an element of a timer is shown in my previous application, a specific type is claimed herein which has two cups. The use of two cups results in much longer life of the timer because of the relative softness of the engaging surfaces. The broad application of the vacuum cup prin-

ciple in timing is shown in my prior application above mentioned and is broadly claimed therein independently of the specific construction shown. In that prior case a single cup is used and it is vacuum-attached to a metal plate. In other words, there is a relatively soft edge of the cup assuming vacuum-attached relation with the relatively hard metal plate. In the present case both surfaces are made of about the same softness and both are softer than metal, and both are preferably of rubber-like composition. Two cups are not necessary, one cup and a soft plate or other substance may be used. By this scheme the life of the timer is very much prolonged. Whatever the material used the scheme is to reduce wear to the minimum by making the contacting surface portions relatively soft. It will be understood that it is not necessary to make the entire cup of soft material, only softness at the contacting point is necessary.

Where the rim of a rubber cup operates against a smooth metal plate, the cup after striking the plate tends to slide out over the face. This sliding friction of rubber over metal occurs as the cup flattens out, and causes wear, causing the rubber to come off in little rolls. By using two rubber cups or rubber meeting surfaces, this wear is largely avoided.

In the present case two rubber cups are provided. One of the cups 78 is attached by screw 79 to the horizontal portion 59 of slide 60. The other cup 80 is suitably attached to the horizontal part of a bracket 81 secured as at 82 to one of the plates 22. The cup 80 is provided with a tubular portion 83 which is secured by the threads 84 of a tubular element 85 passing through the horizontal part of the bracket and having threaded engagement with it. A jam nut 86 secures tube 85. An adjustable valve 87 of the needle type held in adjustable position by jam nut 88. The tubular element 85 has an air intake opening 89 and the valve is tapered as shown to parallel but be spaced from the interior taper 90 of the tubular element 85. By this device the entry of air to annul vacuum-action can be controlled at will, and by adjustment of the screw the timing period can be varied.

The above described structure is representative of a type of timer in which there is no movement of the timer elements during timing action, but in which at the end of the timing period, one of two elements which has been held in fixed relationship with the other is suddenly released to correspondingly suddenly release the stop mechanism. This is a valuable scheme, because there are no parts to become jammed or stuck during movement in the timing period. In the present device one of the elements drops, and it is so arranged that it cannot drop unless the user has torn off the paper which he withdrew before the timing period began.

A valuable feature is the provision of means whereby the act of tearing off results in automatic release of the stop mechanism, as distinguished from manual release as in cabinets, for example, of the push button type, in which the user must push the button to release the stop.

Another feature used in conjunction with the time-stop mechanism is a signalling means, preferably audible, which apprises the user that the timing period is over and that he may now obtain more toweling. This is advantageous because while it is desired to prevent waste, it is not

always the object to prevent dispensing of another length within a reasonable time. When the user becomes accustomed to the signal, he will wait for the signal before attempting to dispense more toweling.

The signalling means comprises a bell 95, a pivoted hammer 96 urged in striking direction by a spring 97. The slide 60 has a spring tripping finger 98, which acts to depress the extension 99 of the hammer 96 against the action of the spring and to release the hammer as the slide continues its downward motion, see Figures 3 and 2.

The idea of feeding or dispensing various kinds of toweling or various kinds of paper following the release of the stop mechanism by the timer at the end of the time period is broader than any particular means for carrying it out. The idea of compelling the user to use what he has already drawn out before he can get more toweling is also broader than any particular form of construction or type of stop mechanism and broader than any particular timer structure. However, along with the broader ideas, all details of construction are claimed.

Although there may seldom be use for it, I have thought it best to provide means for manually operating the roll to feed the paper to accessible position; this in addition to the means for automatically feeding the paper after timing. It may happen that the user, instead of grasping the small accessible portion of the toweling and pulling it to the limit, will first tear off this small portion, in which case the automatic feeding means would not be set for operation following timed release of the stop mechanism. Referring to Figures 7 and 8, in addition to the arm 70 (or in substitution thereof) the shaft 21 is provided with a ratchet disk 100 and a slide 101 having ratchet teeth 102 co-operative with the teeth 103 of the disk. The arrangement is such that by simply pushing inwardly on the slide one or more times the roll is operated to feed the paper to an accessible position and at the same time the time-stop and the automatically acting feeding means are set. If this slide pushing operation is repeated a sufficient number of times the entire allowed length of paper may be dispensed and the stop positioned for timing, or the slide may be operated a lesser number of times, just sufficient to bring a small portion of the paper into accessible position and then the paper may be pulled to its limit as is usually the case. The above slide is only for emergency operation and there is no intention to limit the broader aspects of the invention by its use.

The slide is guided by pins 108, 109, passing through guide slots 110, 111, and the teeth 102 of the slide are normally spaced from the teeth 103 of the disk as shown in Figure 7. The depression of the slide is made against the action of a spring 114, and this spring also acts in conjunction with the guide slots 110 and 111, to advance the slide to and hold it in ratcheting relation with the disk. When the slide is depressed as shown in Figure 8 it moves laterally into operating engagement and then as pushing continues the roll is rotated, and paper is fed to accessible position. The degree of rotation of the slide is limited by the length of the slots. A pawl 116 co-operating with the teeth of the disk prevents reverse motion of the roll.

It will be understood that it is by no means necessary in all instances to used the tear-off blade as means for controlling the stop mecha-

nism, and it is contemplated that in some cases a stationary knife or blade will be used which has no function of controlling the stop mechanism.

I claim as my invention:

- 5 1. A paper dispensing apparatus having a roll with which the paper is in frictional relation, means operated by the roll to limit its degree of rotation, movable paper tear-off means, means by which said tear-off means releases the limiting means as a result of paper tear-off action, and means automatically acting after release of limiting means to move the roll to feed the paper.
- 10 2. In a paper dispensing apparatus having an automatic time stop mechanism, including a part which moves on release of the stop, a signaling means, and means on said part causing the signaling means to operate when the timer of the time stop mechanism has completed its timing operation.
- 15 3. In a paper dispensing apparatus, a roll with which the paper is in frictional relation to be advanced by or to advance the roll, a time-stop mechanism and means by which the roll operates the same, said time-stop mechanism including a pair of vacuum cups which are brought into vacuum suction relation by advancing motion of the roll and means automatically acting thereafter to annul suction action at the end of a predetermined period.
- 20 4. A sheet material dispensing roll, a stop mechanism for said roll including a pair of cups adapted to be vacuum connected when pressed together as a result of roll motion, means operated by the roll for causing the cups to be pressed together, and means automatically operable to annul vacuum action and to obtain release of said cups at the end of a time period to permit roll motion.
- 25 5. A stop mechanism for a measuring roll, having means for stopping roll rotation including a part which automatically moves from stopping position, said part having a vacuum cup, a second vacuum cup with which said first cup becomes vacuum-attached for holding the part in stop position, and means automatically operable to annul vacuum action and release said cup at the end of a time period, whereby timing is accomplished without motion of any element of the timer during the timing period.
- 30 6. A sheet dispensing apparatus having first means which moves as the sheet is dispensed, means for stopping motion of the first means to limit the amount of dispensing including first and second movable stops, one of which is operated by said first means, an operating connection by which the first stop moves the second stop into the stopping path of the first and which thereafter releases the second stop for motion out of said path, means for temporarily holding said second stop in said path after release by the operative connection, and means operated by a pull on the paper for moving the holding means to allow said second stop to move out of said path.
- 35 7. In a dispensing mechanism, feeding means, a spring and means by which it is tensioned by the feeding motion by 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, and means in part automatically annulling limiting means action at the end of a time period to allow said spring to cause said additional feeding motion of said feeding means.
- 40 8. 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 in part automatically annulling limiting means action at the end of a time period 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 crank attached to the roll and having the spring attached to the crank in a manner to permit complete rotations of said crank without interference by the spring.
- 45 9. A sheet material dispensing mechanism having first means which moves when the sheet material is dispensed, means for limiting motion of said first means to limit the amount of material dispensed including, a first stop moved by said first means and a pivoted stop bar having a second stop engageable with the first, means by which the first means moves the bar to stop position and thereafter releases it for gravity movement away from that position, a slide moved by said stop bar and means in part carried by the slide for holding the slide to keep the bar in stop position and means for automatically releasing the holding means at the end of a predetermined time period.
- 50 10. A sheet material dispensing mechanism having first means which moves when the sheet material is dispensed, means for limiting motion of said first means to limit the amount of material dispensed, including a first stop moved by said first means and a pivoted stop bar having a second stop engageable with the first, means by which the first means moves the bar to stop position and thereafter releases it for movement away from that position, a slide moved by said stop bar, and means in part carried by the slide for holding the slide to hold the bar in stop position and means for automatically partially releasing the holding means at the end of a predetermined time period, a bell and means for operating the bell, and in part moving with the slide and operating to sound the bell when the slide is released at the end of said predetermined time period.
- 55 11. A sheet material dispensing mechanism having first means which moves when the sheet material is dispensed, means for limiting motion of said first means to limit the amount of material dispensed including, a first stop moved by said first means and a pivoted stop bar having a second stop engageable with the first, means by which the first means moves the bar to stop position and thereafter releases it for movement away from that position, a slide moved by said stop bar, a first vacuum cup carried by the slide and engageable with a second vacuum cup for vacuum-holding the slide to keep the bar in stop position and means for automatically annulling the vacuum-holding action of the cups at the end of a time period.
- 60 12. A sheet material dispensing apparatus having means for temporarily limiting dispensing, said means comprising a pivoted lever providing a stop, rotary means rotatable as the material is dispensed, and carrying means engageable with
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- 70
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the stop on the lever to limit further dispensing, means by which the rotary means moves the bar to stop position and thereafter releases it for movement away from stop position, a timer device comprising two vacuum-attachable elements, one a vacuum cup, and means by which said lever moves one of said elements into vacuum-attached relation with the other when the lever moves to stopping position, whereby to hold the lever at that position, and means for automatically annulling the vacuum-attaching action of said elements at the end of a time period, to allow movement of said lever away from stopping position.

13. A sheet material dispensing mechanism having first means which moves when the sheet material is dispensed, means for limiting motion of said first means to limit the amount of ma-

terial dispensed, including a pivoted stop bar having a stop engageable with a stop which moves when said first means moves, means by which said first means moves the bar to stop position and then releases it for movement away from that position, a vacuum timer including two elements which when brought together become vacuum-attached, one of said elements being a vacuum cup, and means connecting one of said elements with said bar in such manner that when the bar is moved to stop position said elements are caused to become vacuum-attached, and means for automatically annulling the vacuum-attaching action of said elements at the end of the time period to allow movement of said bar away from stop position.

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DISCLAIMER

2,193,759.—*Rudolph G. Birr*, Lombard, Ill. TOWEL DISPENSING TIME-STOP MECHANISM. Patent dated March 12, 1940. Disclaimer filed December 12, 1940, by the assignee, *Steiner Sales Company*.

Hereby enters this disclaimer to claim 7.

[*Official Gazette January 28, 1941.*]