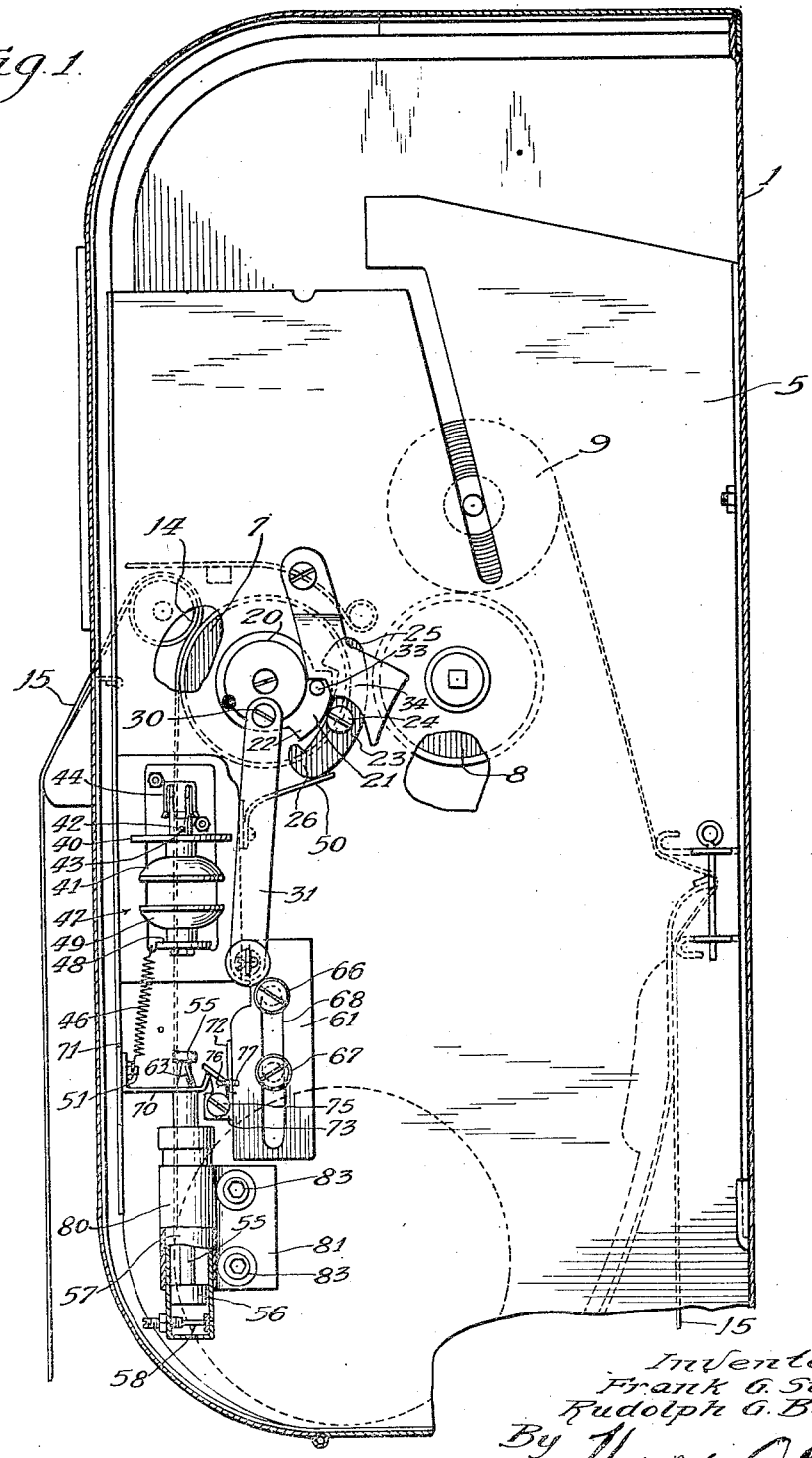
Oct. 12, 1948. F. G. STEINER ET AL 2,451,251

TOWEL DISPENSING DEVICE

Filed July 14, 1944 3 Sheets-Sheet 1

Fig. 1.



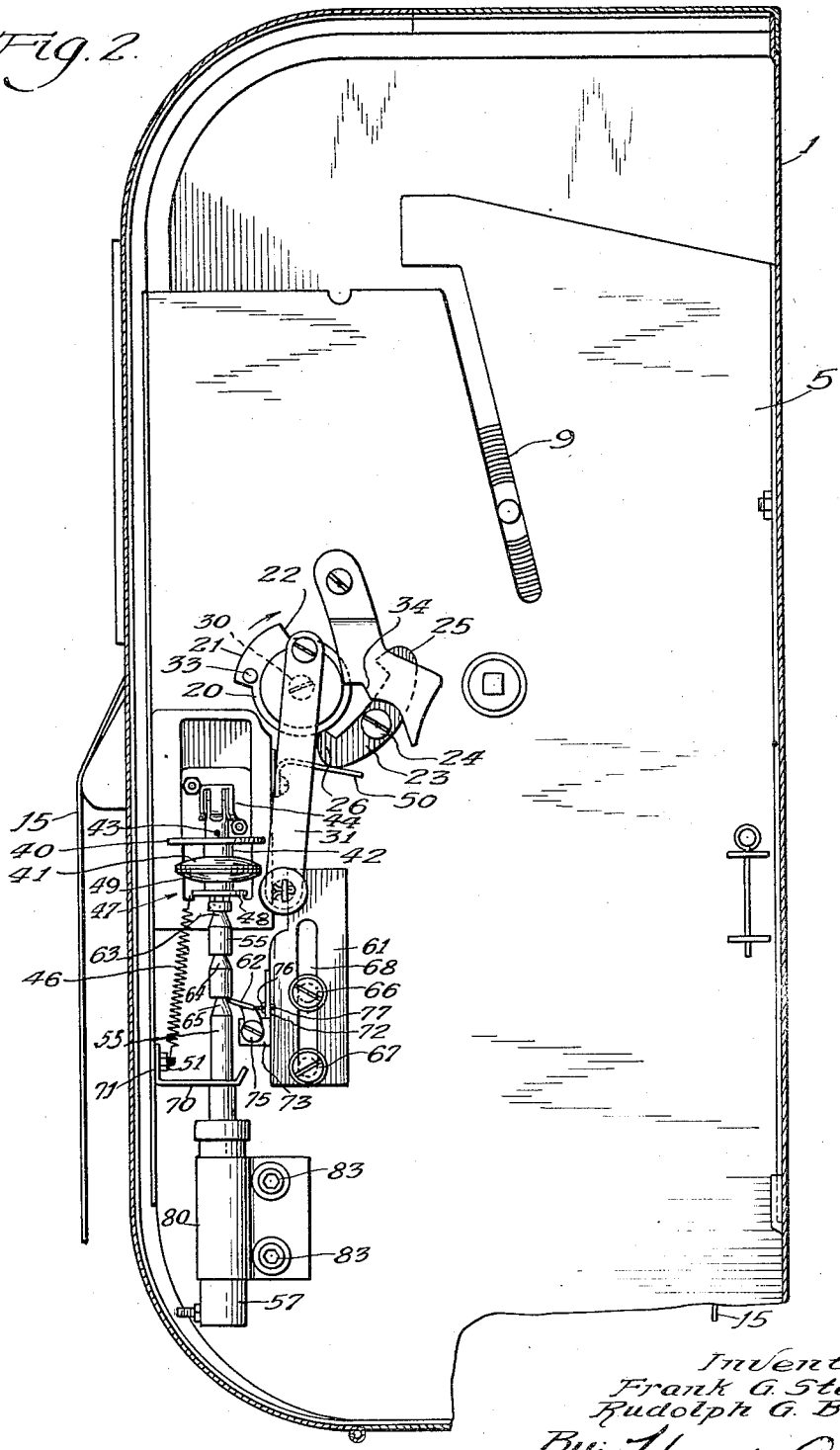
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TOWEL DISPENSING DEVICE

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Fig. 2.



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TOWEL DISPENSING DEVICE

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Fig. 3.

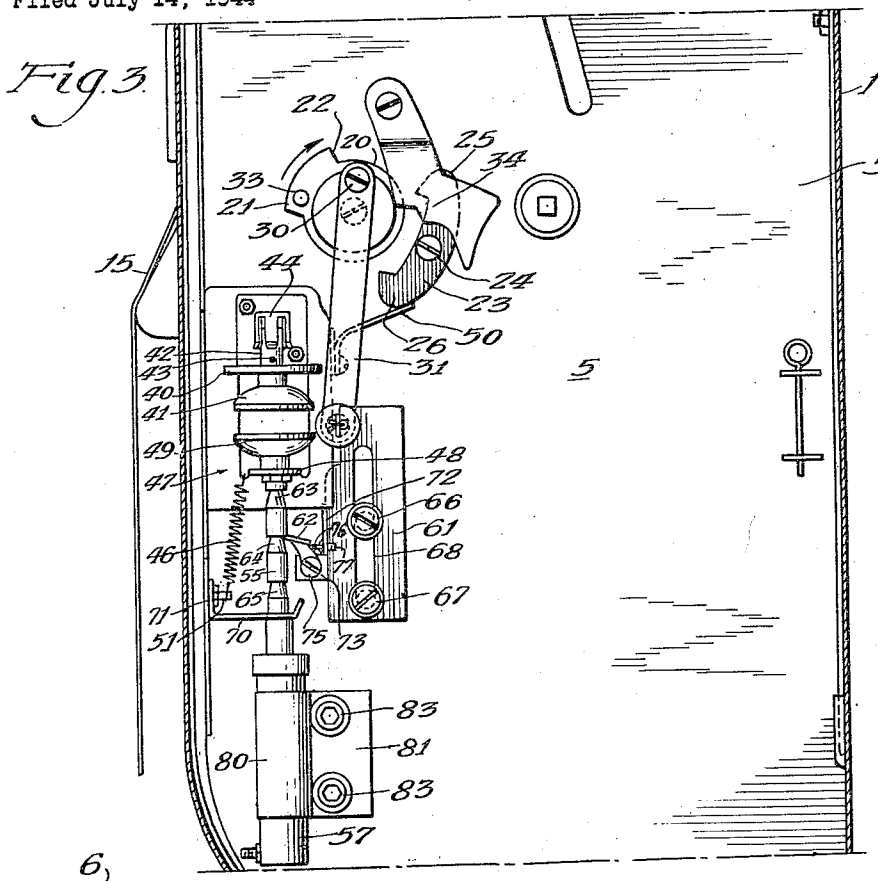
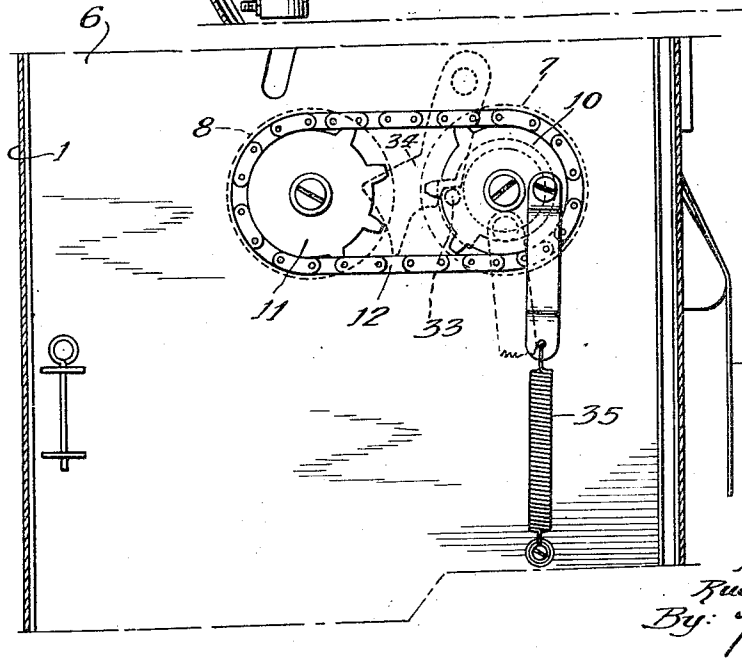


Fig. 4.



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Patented Oct. 12, 1948 2,451,251

UNITED STATES PATENT OFFICE

2,451,251

TOWEL DISPENSING DEVICE

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Application July 14, 1944, Serial No. 544,920

11 Claims. (Cl. 271—2.3)

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This invention relates to improvements in dispensing apparatus and has for an important object to prevent toweling waste by the users of towel dispensing devices. Another object is to allow a user to obtain consecutive lengths of toweling freely, but thereafter to make him wait for a certain time period before he can obtain the next consecutive length. Another object is to limit dispensing to short lengths.

In most towel dispensing cabinets which have timers, the user operates some part which must be moved and which may be a crank or the toweling, and gets the total amount allowed before a time stop becomes operative. Usually the amount of washable toweling given is enough to wipe both hands and face. The user then has to wait before he can again get a second length of that same amount of toweling. The use of a timer has been very effective in saving toweling. However, it often happens that the user only wants or needs enough toweling to wipe his hands or perhaps only enough to wipe the tips of the fingers. When this is so the pulling out of a length of washable toweling large enough for wiping the hands or face is wasteful.

It is therefore another object of this invention to so control dispensing action that the first dispensing operation gives the user only about enough toweling with which to dry his hands. If he wants more he can immediately get another section of toweling of the same length, the combined lengths providing enough toweling for face and hands. The number of consecutive lengths immediately available may be varied. It is another object to allow immediate withdrawal of a few short lengths of toweling and then prevent withdrawal of the next length by means of a timer. However, it is also an object of the invention to provide a mechanism operating for each length in a manner to give the user the impression that he has pulled out all of the toweling he can get. Thus, when he operates the dispensing mechanism for the first length, the toweling is suddenly stopped. To those accustomed to the use of dispensers equipped with a time-stop, this gives the impression that it will be necessary to wait for another length. However, the device herein is so constructed that if after the dispensing is suddenly stopped the user ceases to apply power to the dispensing mechanism the stop will be automatically released so that he can substantially immediately get the second short length, at which time the dispensing mechanism will be again suddenly stopped. The device may allow a third withdrawal in this manner.

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However, at the end of this third withdrawal he will be unable to get another length of toweling until the end of a time period, after which he can again get a plurality, two or three short lengths, under the conditions above mentioned. It is also an object to use fluid-controlled timing means and fluid-controlled timer-operating means.

Thus, with the kind of a mechanism described, some users will believe that they will have to wait too long to get a second length, others will try for a second length, others for a third. On the other hand, the number of lengths which can be had, without waiting, is limited by a timer, and the total amount obtainable before the timer is set, is about equal to the amount usually heretofore dispensed by one pull on the toweling.

Features of the invention include: The method of dispensing by allowing a plurality of consecutive, relatively free dispensing actions and then preventing another consecutive dispensing action until the end of a time period; the method of abruptly arresting dispensing action and then immediately allowing resumption of the same for a plurality of consecutive dispensing actions, and then preventing an additional consecutive dispensing action until the end of a time period; using a stop mechanism adapted to suddenly arrest dispensing, but allowing immediate release of a stop, if the user ceases to apply dispensing force, and using a timer to prevent such immediate stop release; the combination with a stop mechanism which can immediately automatically open following stopping action of fluid-controlled means for preventing such opening until the end of a time period; the use of two fluid-operable or -controlled devices which can be time-adjusted differentially in relation to one another for controlling dispensing; the structure by which a step-by-step movement is given to a stem for the purpose of setting a timer; the use of a fluid-controlled device for controlling retrograde motions of a stem; the use of a fluid-controlled stem having notches with a pawl operable by dispensing action and engageable with the notches for setting the stop mechanism for automatic timing and automatic release; the arrangement by which the stem of a piston of a pneumatically controlled device is used as a means for setting another pneumatically controlled device and in which, after the setting action, the piston of the first mentioned device moves away from setting position under the control of a regulated escape of fluid; the use of a pneumatic device for holding a piston against retrograde movement as it is

translated by a step-by-step movement for setting another pneumatic device; the use of two timers, each of which can be regulated so that its timing period may be varied, to obtain time differentials of various kinds; all details of construction shown or described; and all 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—

Fig. 1 is a vertical sectional elevation of the stop mechanism positioned as before the first dispensing operation with the stop in release position;

Fig. 2 is a view similar to Fig. 1 with the timer set, the timer-setting stem in its most advanced position and with the stop set;

Fig. 3 is a view similar to Figs. 1 and 2 showing the stem so positioned that its next upward motion by the pawl will set the timer; and

Fig. 4 is a view of the plate at the opposite side of the cabinet showing the arrangement of the back-off spring, in relation to the drive means for the measuring and takeup rolls.

The invention herein is shown applied to a type of dispensing cabinet known as a "continuous," designed to dispense washable toweling and in which soiled toweling is rolled up as clean toweling is withdrawn. A loop of toweling is maintained outside and at the bottom of the cabinet. The interior structure (not shown in detail herein) is similar to that of Fig. 1 of the patent to Birr et al. 2,295,252, as to the arrangement of the dispensing and takeup rolls, soiled towel smoother, etc. The present invention is only concerned with a new means for controlling the dispensing of all kinds of sheet material in any type of cabinet. It is only limited to the extent of requiring means which must be moved if dispensing is to occur. This invention is concerned with a particular method of controlling the movement of such a means.

In the drawings the numeral 1 generally designates the outer casing, the front of which is closed by upper and lower doors. Each door closes about one-half of the cabinet, and a towel exit slot is formed between the edges of the doors.

In this embodiment there is an inner unit which is detachably secured to the outer casing, but this invention is not concerned with the particular structure of this unit. It includes a pair of side plates respectively designated 5 and 6 and the rear edge of each plate is detachably secured to the back wall of the casing 1. Most of the parts of the dispensing mechanism are mounted on one of these plates and the mechanism includes a pair of rolls having their axes parallel and arranged in substantially the same horizontal plane midway between the top and bottom of the cabinet.

The front roll 7 is called the measuring roll and the back roll 8 operates a soiled towel takeup roll 9 by frictional engagement of the toweling thereon. In the broader aspects of the invention the measuring roll represents any means which must be moved if dispensing is to occur.

Rolls 7 and 8 are suitably journaled in the plates 5 and 6. The rolls are the same diameter. Each roll has a sprocket gear which lies at the outer side of plate 6. These gears 10, 11 are of the same diameter and are connected by a sprocket chain 12 to operate in unison so that after the loop is formed (at the time of loading the cabinet) this loop is maintained by causing the same amount of soiled toweling to be taken up as the amount pulled out by the user. The mechanism is associated with the usual pinch roll 14 around which the toweling 15 is trained.

The foregoing mechanism has been described only as a basis for certain broad aspects of the invention particularly sought to be covered herein which relates to a method and means for controlling dispensing as related to the mental reaction of a user. The roll 7 represents means which must be moved if dispensing is to occur, but such means does not necessarily have to be a roll, nor does the sheet material necessarily have to engage it.

The numeral 20 indicates a cam disk movable with the roll 7, having a camming portion 21, one end 22 of which acts as a stop. Associated with this cam is a rock lever 23 pivoted midway of its ends at 24 and having at its upper end a head 25 and at its lower end a head 26. This lever, as a second stop, is adapted to move automatically away from stopping position. This stop mechanism, therefore, acts to suddenly arrest dispensing and is intended to give the impression, to those acquainted with time-stop controlled cabinets, that they will have to wait to get another length of toweling, but this is not true because the stop will promptly, automatically release if the user will ease up the withdrawing or pulling force.

Threaded in the cam disk 20 is a crank pin 30 on which is pivoted one end of a link 31. The cam disk has a pin 33 which is engaged by a back-off pawl 34 to limit reverse motion of the cam disk. A back-off spring 35 is shown as connected to one of the sprocket wheels and to the plate 6. This spring moves the measuring roll in reverse direction for the purpose of assuring automatic release of the rocking stop lever 23 as soon as the user ceases to pull or eases up on the toweling enough to permit the back-off spring to act.

The numeral 40 indicates a bracket below which is arranged a vacuum cup 41. The inner side of this cup communicates through a tube 42 with an air intake orifice 43 the size of which is controlled by an adjusting screw operated by finger piece 44. Slidable against the face of the plate 5 is a cup-carrying slide 47 having a bracket 48 to which is connected a vacuum cup 49, adapted when the slide is moved upwardly, to be vacuum-attached to the first mentioned cup 41. A spring 46 assists the gravity action of the slide 47 to separate the cups when the vacuum-attaching force has been annulled. In the broader aspects of the invention any suitable type of timer mechanism may be used to control any suitable type of stop mechanism.

Means is provided to set the timer and at the same time to move the lever 23 to stopping position in relation to stop shoulder 22. The stop mechanism is held against release during the timing period. On the slide 47 is a yieldable spring arm 50 which engages the lever 23 and moves it to stop position during setting of the timer and holds it in stopping position during timer action.

Means operable by the roll 7 initiates timer action or sets the timer. In this case the timer releases automatically.

Arranged below the bracket 48 which supports the lower cup 49, and engageable with said bracket is a notched piston stem 55 having a piston 56 slidable in a cylinder 57, said cylinder being suitably attached to the side plate 5. An adjustable needle-valve means 58 is provided at the bottom of the cylinder to control the exit of air, whereby

to regulate movements of the stem and to hold it momentarily at a given position.

The stem of this piston is adapted to be moved upwardly to engage the bracket **48** and move the cup-carrying slide to cause vacuum attachment of the cups and cause spring arm **50** to set the stop lever **23**. After this is done a timing cycle begins, at the end of which the cups are automatically released and the cup slide moves downwardly under the action of the spring **46**, and the stop lever **23** moves to nonstop position.

Means operable by the dispensing roll by means of the crank link **31** include a slide **61** held and guided to move vertically and in parallelism with the axis of the stem by means of screws passing through a slot. On this slide is pivoted a pawl **62**, spring-pressed toward the stem, which stem in this instance has three notches **63**, **64**, **65**. When the pawl-carrying slide **61** is in its lowermost position which corresponds to that position at which the stop **23** is released, it is held out of its notch-engaging path by means of a bracket **70** attached to a front flange **71** which extends laterally from the front of the side plate **5**. As soon as dispensing begins the pawl moves away from the bracket **70** and its spring **76** moves it against the stem and into notch-engaging relation.

Assuming the parts positioned as in Fig. 1. On the first dispensing operation the cam disk is given one rotation which causes the part **21** to engage the head **25** and kick the lever or rocking stop **23** to a position at which its head **26** is in the path of the part **21**. During this movement the pawl engages the top notch **63** of the stem **55** and moves the stem upwardly where it is held for a sufficient period against retrograde movement by the fluid trapped in the bottom of the cylinder. This period can be shortened or lengthened by adjustment of the fluid-control means **58**.

If the user now releases the toweling the rock stop **23** will automatically move to release position. On the next consecutive operation (which, if it occurs, does so promptly) the stopping and unstopping actions are repeated while the pawl engages the second notch **64** and moves the stem upwardly so that its upper end is nearer to the bottom of the bracket **48** for the lower cup **49**. By the end of a third operation the pawl has engaged the lower notch **65** of the stem and has caused the stem to engage and move the cup bracket to move the cup into vacuum-attached relation. On this movement the yieldable spring arm **50** which is carried by the cup slide **47** moves the rock stop **23** to stop position where it is held until the end of the timing period. At the end of the timing period (controlled by letting a regulated amount of air in between the cups), the cups separate and the lower cup and its slide move downwardly by the action of gravity and/or the spring **46** and the rock stop is allowed to again assume the open or nonstop position. During timing the stem under regulation by fluid in the cylinder **57** moves again to its initial position as shown in Fig. 1.

Thus, means has been provided which will allow a plurality of consecutive withdrawals of toweling, after which further consecutive withdrawal is prevented until the end of the time period. The purpose and advantage of this arrangement have been previously mentioned.

It is to be understood, of course, that the number of relatively free operations can be varied before stop release is timed to make the user wait for the next consecutive operation.

One end of the retracting spring **46** for the cup slide **47** is anchored on the screw **51** which secures the pawl hold-out bracket **70** to the front flange **71** of the plate **5**.

The pawl slide **61** is secured against the face of the plate **6** by means of two screws **66**, **67** passing through a slot **68** in the plate. At the forward edge of the plate a flange **72** is bent out to be perpendicular to the face of the plate **5** and part **73** of this flange is bent to a position parallel with the plate **5**. The pawl is connected to this flange by means of a suitable screw **75**. The spring **76** for moving the pawl to operative position is held by a small screw **77** passed through the flange **72**.

The cylinder **57** is suitably held in a clamping member which is composed of a single sheet of metal bent to provide a cylindrical portion **80** which embraces the cylinder and to provide terminal plates **81** brought flatly together and held by studs **83** extending perpendicularly from the plate **5**, clamping screws being provided to bring the extensions together and therefore cause the cylindrical portion to exert clamping pressure to hold the cylinder.

The number of strokes necessary to move the piston stem **55** a certain distance can be varied by changing the position of the crank pin **30**, for example, moving it a greater distance from the center of rotation to increase the length of the strokes and thus require fewer number of strokes, or by placing it nearer the center of the axis of rotation to decrease the length of strokes and therefore require larger number of strokes, to accomplish the same purpose, that is, move the plunger or stem **55** a sufficient distance to cause the timer to be set for timing.

The regulation of two elements of this invention, to-wit: the timer and the movements of the stem, each by fluid means, is a valuable feature. Both of these movements can be varied by merely turning a screw. Thus, various differential timed relations between the timer and the stem can be obtained.

It is desirable to so control the retracting rate of movement of the stem that its top will be sufficiently spaced from the bottom of the cup support at the end of the timing period, so that the support will not strike the top of the stem. On the other hand, it is desirable to have the speed of retrograde motion of the stem as slow as possible so that no undue degree of motion will occur in the interval between upward feeding strokes of the pawl as controlled by dispensing action. This differential can be nicely controlled by adjustment of fluid flow.

These motions can be and are nicely regulated in relation to the known average reactions of the users to machines of this kind. Some users will make quick and successive attempts to obtain more toweling. Other users will make only one attempt, wipe the hands and then leave the machine. If only one attempt is made the stem will only have been moved as a result of engagement of the pawl with the topmost notch **63** thereof. In the case where two consecutive operations or attempts are made quicky the pawl will have acted by engagement with both the first and second notches, and if no more dispensing action occurs the stem will fall back to its initial position of Fig. 1. If consecutive, quick operations are made, all three notches may have been engaged and the timer will have been set. Of course, after this occurs any further attempt to obtain toweling is resisted, except at the end of the time period. In the meantime, during this timing period the

stem is moving downwardly and it is desirable that it wall have reached its lowermost or initial position by the end of the timing period.

The action of the piston in moving away from its position of engagement with the movable element of the time stop should be so regulated that by the end of the time period it will have moved to its initial position, or it will have moved sufficiently to allow the timer stop to move to fully retracted or released position, after the timer is released. On the other hand, the adjustment should be such that retractive motion of the stem will not occur to any substantial degree during the interval between pawl engagements therewith.

This differential adjustment between the time period and the period necessary for the plunger to move out of the way so that the timer can open fully is easily regulated and very nicely regulated by adjusting the fluid-controlled means used both for the timer and for control of the timer-setting plunger or notched piston stem.

Now it will be understood that in that phase of the invention which relates to plural deliveries, the arrangement could be such that only two lengths of toweling are given and the third is unobtainable except at the end of a time period and therefore there is no intention to be limited to more than two lengths obtainable before the time stop is set, so that the user will have to wait for the next length.

The use of a fluid-controllable means for setting any kind of a timer is believed to be new and all phases of the invention are not, therefore, limited to the multiple movements in relation to an automatically releasable stop.

In the dispensing of any kind of material the fluid-controlled stem can be used only as a setting means, and can have a single movement to set the timer instead of a plurality of movements.

Other means than a pawl may be used for advancing the stem, and the fluid can be controlled to obtain its prompt retraction. Various modifications can be made in the use of this new timer-setting, fluid-controlled means.

The invention has been embodied in a cabinet adapted for dispensing washable toweling, and the invention finds valuable use in such a cabinet in reducing the amount of toweling used. Such toweling is relatively expensive as compared with paper, because of deliveries and handling and laundry costs and rolling after laundering. However, the invention can also be used in paper dispensing, and thus no limitation is intended by illustrating its use in a "continuous" type of cabinet.

It has been stated heretofore, in relation to the dispensing of fabric toweling, that short lengths only are dispensed. These lengths are ordinarily from four to five inches long and are intended to be used for drying the hands only. When a measuring roll is used the lengths of delivered towel are proportional to the diameter and to the number of rotations of the measuring roll. To simplify the stop mechanism it is desirable to deliver the desired length of toweling as a result of a single rotation of the roll, and that is done herein.

The diameter of the roll will be increased for dispensing paper, and ordinarily a longer length of paper will be dispensed at each operation, for example, lengths of from six to eight inches. However, with this invention, shorter lengths of paper can be dispensed and since short lengths of paper are not usually dispensed, some users

will get the impression that they will have to wait for a second length of paper and will not wait, which will result in saving of paper, as in saving of fabric toweling.

We believe our invention to be broader than the specific means for carrying it out, because we believe ourselves to be the first to conceive of taking advantage of the known mental reactions of users of dispensing machines to induce some to use less toweling because they believe they must wait for a time period to get more, and yet making it possible for them to get more without waiting for a time period, if the user will make another trial to get more.

In one phase of this invention the timer and the stop mechanism are considered as a unit constituting what is known as a time-stop mechanism. We believe we are the first to conceive of setting the timer of such a mechanism by any fluid-controlled means or by any such means in which the rate of control of the flow is adjustable or can be timed, and in which such fluid-controlled means is operated by the act of dispensing, to operate a fluid-controlled member to set the timer, or to set the timer of a time-stop mechanism to prevent release of the stop except at the end of a time period.

The use of a fluid-controlled stop-setting and/or timer-setting device is therefore believed entirely new, whether the control element is moved step by step or at a single stroke to perform its stop-setting and/or timer-setting function. In this case the speed of the retracting stroke is fluid-regulated, but it will be understood that the direction in which motion is fluid-controlled may be varied. A fluid-controlled device therefore provides for a wide range of adjustment for timing and a wide range of uses in relation to the setting of stops and/or of timers.

We believe ourselves the first to use fluid-controllable means for either setting a stop in some desired position or for setting the timer of a time-stop mechanism. By fluid control we mean to include fluid regulations of a moving part in various directions, and/or the use of that fluid-controlled part in relation to any kind of a timing mechanism or timer, and specifically in relation to a timer which is also fluid-controlled in any desirable way. We think it broadly new to use one fluid-controlled means for controlling another fluid-control means such as a timer, in relation to any kind of dispensing device in which some element must be moved either before dispensing action occurs or during dispensing action.

While we believe that the specific control illustrated herein by means of which a plurality of consecutive lengths is dispensed and then the user is caused to wait for the next consecutive length is entirely new, we also think it broadly new to use a fluid-controlled element in relation to setting the stop or timer of such a mechanism for such a purpose. The use of fluid-controlled means allows for fine adjustment in timing and fine adjustment in relation to the amount of force used in the operation, and it will be understood that by using the word "fluid" we mean to cover compressible as well as uncompressible fluids. In this instance the fluid used is air, both for the timer and for the means which controls timer-setting or stop-setting.

When a piston type of device is used and when gravity acts only on the piston, the sliding fit of that piston will be sufficiently loose to avoid undue friction.

What we claim is:

1. A dispenser for sheet material having a stop mechanism operable through force applied to a dispensing means, to assume stopping position and then be promptly automatically released when the application of dispensing force ceases, timing means adapted during timing action to prevent automatic release of the stop mechanism, and means to initiate timing action of said timing means, after a plurality of forced operations and automatic releases of said stop mechanism.

2. A device of the class described comprising first means which must be moved to obtain dispensing, a first stop operated by said means, a second stop movable into stopping relation with the first stop and adapted to automatically release said first stop, means movable by the first means for moving the second stop into the path of the first stop, a settable timing mechanism for controlling the second stop to prevent release thereof while the timer is set for timing, said timing mechanism including two members which engage and remain immovable during timing action, a cylinder having a fluid-controlled piston having a notched stem and means operated by the first means and having a part adapted to engage the notches of the stem and cause it to set the timer, following a plurality of automatic stop release actions of the second stop.

3. A device of the class described, comprising first means which must be forcibly moved to obtain dispensing, a first stop operated by said means, a second stop movable into stopping relation with the first stop to suddenly arrest dispensing action of the first means, and adapted to immediately automatically release said first stop if the user ceases to apply force to the first means, means movable by the first means for moving the second stop into stopping relation with the first stop, a first settable means for preventing release action of the second stop for a time period, a second settable means for setting the first settable means for its preventing action, and means operable by dispensing action of the first mentioned means to cause the second settable control means to set the first settable means for its preventing action, following a plurality of automatic release actions of the second stop.

4. A device of the class described, comprising first means which must be moved to obtain dispensing, a first stop operated by said means, a second stop movable into stopping relation with the first stop and adapted to automatically release said first stop, means movable by the first means for moving the second stop into stopping relation with the first stop, a first settable fluid-controlled means for preventing release action of the second stop for a predetermined time period, a second fluid-controlled means for setting the first fluid-controlled means for its preventing action, and means operable by dispensing action of the first mentioned means to cause the second fluid-controlled means to set the first fluid-controlled means for its preventing action, following a plurality of automatic release actions of the second stop.

5. A device of the class described, comprising a measuring roll having a disk having a lug which acts as a stop, a stop which automatically moves out of the path of the lug, means on the roll engageable with the stop to bring it to stop position, said lug engaging the stop to retain it in stopping position only until the application of force to the roll ceases, a timer adapted to be set and then to be automatically released at the end of a time period, and including a part which moves to setting position, which part has means adapted to move the stop to and hold it in stopping position during timer action, said disk having a crank pin, a link pivoted on the crank pin, a fluid-controlled stem adapted to move said part to set the timer and having notches, and a pawl operable by the link to successively engage said notches and move said stem, and as a result of a plurality of such movements corresponding in number to the automatic release movements of the stop, to cause said timer to be set to prevent automatic release of the stop, and thereby cause the user to wait for a time period before receiving another consecutive length of toweling.

6. In combination with a stop mechanism which has a lever stop which automatically releases after stopping action, an automatic timer adapted to be set and having a movable part which during setting engages and moves the lever to stopping position and holds it in that position until the end of the time period, and fluid controlled-timer means for moving that part to move the lever to stopping position.

7. A device of the class described, comprising a roll having a first stop, a second stop rockable into stopping relation with the first stop, and automatically movable away from stop position, means movable by the roll for rocking the second stop into the path of the first, the first stop being adapted to hold the second in stopping position only as long as force continues to be applied to the roll, and a timer including two elements which are brought into contacting relation as dispensing occurs and which remain in that relation during the timing period, means for automatically causing one of said timer elements to be released at the end of that period, and means movable by one of the timer elements and adapted to move the rockable stop into stopping position and to hold the same thereat until at the end of the timing period.

8. A device of the class described, comprising a roll having a first stop, a second stop rockable into stopping relation with the first stop, and automatically movable away from stop position, means movable by the roll for rocking the second stop into the path of the first, the first stop being adapted to hold the second in stopping position only as long as force continues to be applied to the roll, and a timer including two elements which are brought into contacting relation as dispensing occurs and which remain in that relation during the timing period, and means movable by one of the timer elements and adapted to move the rockable stop into stopping position and to hold the same thereat until at the end of the timing period, one of said elements being a vacuum cup, and said elements remaining vacuum attached during timing, and means to annul the vacuum action at the end of the time period.

9. A device of the class described comprising, a dispensing roll having a first stop, a second stop rockable into stopping relation with the first stop and automatically movable away from stop position and adapted to be held in stopping position by the first stop only so long as the roll is being held by dispensing action, first means movable by the roll for rocking the second stop into the path of the first, second means for rocking the second stop into the path of the first, and means operable by the first stop for moving the second means to move the second stop into and hold it in the path of the first.

10. A dispenser having, first means to which force is applied during the act of dispensing, said means having a first stop, a second stop adapted to be moved into the path of the first stop, the second stop being adapted to be automatically released but also adapted to be held against automatic release by the first stop as long as force is being applied to said first means, independent means for preventing automatic release of the second stop, and means operable by the first means during dispensing and only after a plurality of consecutive automatic release actions of the second stop, to cause said independent means to prevent the next consecutive automatic release of said stop.

11. A device of the class described, having a plural-part stop mechanism including a stop which can automatically release immediately after stopping action, a vacuum-controlled automatic timer adapted to be set and when set

adapted to prevent automatic release of the stop, means fluid-controlled against retrograde motion and adapted to be advanced to set the timer, and means operable through part of the stop mechanism for advancing said fluid-controlled means step by step to set the timer.

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